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CREATE Symposium

S. Czaja, J. Sharit. The Usability of Telephone Voice Menu Systems for Older Adults. Gerontechnology 2002; 2(1): 88. The versatility, decreasing costs, and increasing power of telephone voice menu systems are expanding their use for a large variety of tasks. Unfortunately, many users have experienced difficulty and frustration using these systems. This paper presents findings from a series of studies that investigate the ability of older people to use telephone voice menus. The initial study examined if older adults encounter difficulty using real world telephone menu systems and to gather data on menu usability. Six real world telephone menu systems were examined. The sample included thirty-two adults aged 18-80 years. Participants used the menus to perform a sample set of tasks. The data indicated that older adults had more difficulty using the menus and that older adults found the system less usable than younger adults. The second set of experiments investigated how design features impact on user performance and the potential benefit of environmental support aids. Subjects from three age groups, younger (18-39), middle-aged (40-59), and older (60 and over) performed a set of tasks using simulated voice menu systems. Measures included: task performance, menu navigation, and subjective evaluations. Experiment 1 examined the effect of speech rate. Data from 196 subjects indicated age differences in performance, especially for complex problems. However, there was no effect of speech rate. Experiment 2 examined two types of support aids: a screen phone and a graphical aid. The older subjects benefited more from the graphical aid while the younger subjects performed better with the screen phone. These findings have implications for the design guidelines for these types of systems.
Key words: telephone voice menu system, usability, environmental intervention.
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N. Charness, P. Holley, J. Feddon, T. Jastrzembski. Input Devices: Minimizing Age Differences in Performance. Gerontechnology 2002; 2(1): 88. A series of experiments examined the relative advantages and disadvantages of direct (light pen) and indirect (mouse) positioning devices. The tasks involved menu selection (pure pointing) and mixed pointing and data entry tasks. We also examined the role of practice and preferred versus non-preferred hands contrasting both experienced and inexperienced users. Experiment 1 showed that the light pen was significantly superior to the mouse for both middle-aged and older adults, despite the main effect of age on performance. The preferred hand was superior to the non-preferred hand. The interaction of trial block and device indicated that the mouse gained more from practice. Experiment 2 used the same menu selection task with young, middle-aged, and older adults who were experienced mouse users. We found main effects of age, hand, and device with the light pen yielding better performance than the mouse. Interactions indicated that the light pen minimized age differences, practice minimized age differences, and that the light pen minimized hand differences. However, preference and performance were unrelated. Experiment 3 investigated mixed pointing and data entry with younger, middle-aged, and older adult experienced mouse users. Main effects were observed for age, practice, and hand. A device by block by age interaction indicated that the mouse was superior to the light pen only for the young adults on early trial blocks. Older adults gained more from practice. We suggest guidelines for input device selection and training based on these findings.
Key words: input device, mouse, light pen, computer, ergonomics, human factors.
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W.A. Rogers, A.D. Fisk. CREATE at Home: Human Factors Contributions to an Aware Home for Older Adults. Gerontechnology 2002; 2(1): 89. The Center for Research and Education on Aging and Technology Enhancement (CREATE) is designed to determine the design and training needs for older adults' interactions with technology. In this presentation we will discuss the importance of these efforts for the development of technologies in the home. Maintaining functional independence is a high priority for many older adults. Often, staying in their homes is key to such independence. Computer technology has the potential to assist in this goal by supporting the everyday tasks of older individuals, as well as by aiding caregivers and family members. An "aware" home can provide support in numerous ways including: alerting the person to an emergency or hazardous situation (e.g., the stove left on); providing information about daily activities and long-term trends, and changes therein (e.g., reduced movements); providing support for daily activities such as medication monitoring or use of medical technologies; and also supporting social communication with family and friends. For these efforts to be successful, psychology must be involved and the research efforts of CREATE provide valuable direction. We will briefly discuss studies of health care technology, communication technology, and telemedicine. These examples demonstrate the complexity of the issues involved in designing the computationally capable home of the future and provide direction for future research and development efforts.
Key words: Technology, domotics, health care, telemedicine.
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J. Sharit, S. Czaja, M.A. Hernandez. Assessing the Suitability of Telecommuting Work for Older Adults. Gerontechnology 2002; 2(1): 89. This talk will present findings from a study designed to evaluate the suitability of telecommuting work for older adults. Fifty adults between the ages of 55 and 75 were trained to perform the task of a customer service representative on a simulated telecommuting task. The task required that they process e-mails sent by customers who had various questions regarding products they had purchased or intended to purchase from a company's website. Subjects had to open an e-mail, interpret it, and search through a database to identify and select all relevant items of information that would constitute a reply. The database consisted of a hierarchically organized set of menus containing information concerning the company's policies and procedures, and two tables that contained product, customer, and order information. Each experimental session lasted a maximum of 2 hours, and the participants were instructed to reply to as many of the 40 e-mails that were allocated to each session. The participants performed the task over a 4-day period, with 2 sessions on each day. Across sessions, the e-mails were constructed to address similar issues in order to maintain the level of complexity and novelty relatively constant. In addition to measures of cognitive abilities that were obtained from a battery administered prior to the study, data on task performance, personality, work involvement, job motivation, job satisfaction, job characteristics, and perceived workload and stress were collected. The findings will be summarized in terms of relationships between age, learning curves, information search capabilities, cognitive abilities, motivation, and job assessment factors, with the objective of understanding how the interplay between task-related and individual factors may predispose this type of work for older adults.
Key words: aging, telecommuting, simulation, search, cognitive ability, job satisfaction.
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Technology and Dementia

D. Mahoney, B. Tarlow, R. Jones. Using multi-media technology to increase older adults knowledge of Alzheimer's disease. Gerontechnology 2002; 2(1): 90. Objective: The aim of the project was to determine the response of older adults to a CD-ROM based multi-media program developed integrating geriatric learning and technology principles, with the desired outcome to increase elders' knowledge about the differences between 'normal' forgetfulness and more serious memory loss associated with Alzheimer's Disease (AD). Design and Measurements: A randomized controlled study with post-test measures was conducted with elders (mean age of 72) recruited from the community. The intervention group (n=56) used the program, the control group (n= 57) did not. Both groups completed a 25 item general Knowledge about Memory Loss Test (primary outcome), socio-demographic and technology usage questionnaire. In addition, viewers completed a user evaluation. Results: The mean (standard deviation) number of correct responses to the knowledge test was 14.2 (4.5) for controls and 19.7 (3.1) for intervention participants. This highly significant difference (p=<.001) corresponds to a very large effect size. Subgroup analyses revealed that the program was most effective for participants with a lower level of self-reported prior knowledge about memory loss and AD (p=0.02). Viewers were very satisfied with the program, felt it was easy to use and understand. Conclusion: Older adults benefited from this gerontechnology program because it allowed them to adapt the delivery of information to their preferred learning style. This CD-ROM technology offers both and efficient and effective means to teach older adults about memory loss. It offers a means to outreach to caregivers who have concerns about memory loss in a family member to promote AD detection.
Key words: Alzheimer's disease, computer learning, health education, aged.
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H. Kautz, G. Borriello, O. Etzioni, D. Fox. Assisted Cognition: Computer Aids for People with Alzheimer's. Gerontechnology 2002; 2(1): 90. The rise of Alzheimer's disease is one of the greatest health crises facing the industrialized world. Today, approximately four million Americans suffer from Alzheimer's disease; by 2050, the number is expected to rise to 15 million people. As a result of the increasing longevity of the elderly, many sufferers are now aware that their capacities to remember, to learn, and to carry out the tasks of everyday life is slowly being lost. The Assisted Cognition Project is a new joint effort between the University of Washington's Department of Computer Science, Medical Center, and Alzheimer's Disease Research Center that is exploring the use of AI systems to support and enhance the independence and quality of life of Alzheimer's patients. The goal of the Assisted Cognition project is to develop novel computer systems that will enhance the quality of life of people suffering from Alzheimer's Disease and similar cognitive disorders. AC systems use ubiquitous computing and artificial intelligence technology to replace some of the memory and problem-solving abilities that have been lost by an Alzheimer's patient. Two concrete examples of the AC systems we are developing are an 'activity compass' that helps reduce spatial disorientation both inside and outside the home, and an 'active prompter' that helps patients carry out multi-step everyday tasks.
Key words: artificial intelligence, Alzheimer's disease, computer.
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S. Yonemitsu, Y. Higashi, T. Fujimoto, T. Tamura. Research for practical use of rehabilitation support equipment for severe dementia. Gerontechnology 2002; 2(1): 91. Is an entertainment robot useful in occupational therapy for severely demented elderly persons? Pet therapy is one candidate for treating patients with severe dementia; the animal is introduced into the group and the care of the animal by the patient results in improved well being and lessened wandering and agitation. However, using a real animal with severely demented elderly patients poses several problems. We must prevent danger to the patient and maintain cleanliness at the site. The aim of this study is to evaluate the effectiveness of an entertainment robot animal, AIBO. The entertainment robot (AIBO- ERS-312) made of metal responds to speech commands. We demonstrated AIBO's function and observed the reaction in elderly people with dementia. Subjects were severe dementia elderly patients (four cases) in an old-age nursing home. The frequent reaction to the introduction of AIBO was to look at, communicate with, and care for the AIBO. The patient recognized the AIBO as a robot. However, once we dressed the AIBO, patients perceived AIBO as either a dog or a baby. Nevertheless, the presentation of AIBO resulted in positive outcomes for the severe dementia patient including increased communication between the patients and with AIBO. In conclusion, it was clear that the AIBO was an effective rehabilitation tool in the care of severe dementia patients.
Key words: dementia, entertainment robot, occupational therapy.
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D.A. Ross, J.A. Sanford. Remotely Monitoring Physical Activity of Older Adults with Moderate Dementia. Gerontechnology 2002; 2(1): 91. Objectives: A remote device to monitor exercise compliance was developed for older adults with mild to moderate dementia, and was calibrated specifically for use by adults transitioning into frailty who tend to expend lower amounts of energy than is typically measured by existing activity monitors. Inconspicuous operation was required, as people with dementia tend to tamper with devices they find on their person. Desired characteristics included: (i) small enough to be worn for extended periods of time without notice, (ii) recording of calories burned versus time, (iii) automatic transmission of collected data to a remote computer, (iv) ability to record for 7 days before needing to transmit data to the remote site, (v) minimal caregiver involvement, (vi) can be worn at a number of alternative body sites, and (vii) water and shock resistant. Results: By recording the length of time nursing home residents with dementia wore a variety of different sized devices, the maximum tolerable weight and size were determined as 60 grams and 4 cubic centimeters. Least obtrusive body sites were medial and lateral ankle positions, back of shoe and tongue of shoe. A full table of correlations between the prototype and standard metabolic values versus body site, and patient weight, height, and degree of frailty will be presented. Monitor accuracy, as compared with an O2 consumption system, was found most reliable for walking exercises and least reliable for stretching exercises. Results of home trials will be available in July 2002.
Key words: remote monitoring, dementia, frailty, exercise.
Author Address: Atlanta VA Rehab R&D Center, MS 151-R, 1670 Clairmont Road, Decatur, Georgia 30033, USA, e-mail: davidross1@mindspring.com

Mobility

H. Kawai, S. Hiki. A System for assessing the walking ability of the elderly. Gerontechnology 2002; 2(1): 92. Various elderly characteristics were extracted from the video pictures of the walking action by sixty subjects aged 40 to 90, through the measurement of the stride period, stride length, and the contact and swing durations. Those characteristics were summarized into the two indices, namely, the agility composed by the walking speed and the advance speed of the foot, and stability composed by the swing duration and the lateral symmetry of the foot movement. It was ascertained that these indices correspond to the range of daily activity and possibility of use of the stairs. The changes in rotation angle of the hip, knee, and ankle joint during the foot taking off were also measured, and the elderly characteristic of the movement of the lower extremity was examined. Although the hip joint extended during pre-swing period in two thirds of the subjects, it flexed in one third of the subjects, about 70% of who were over 70 years old. The flexion of the hip and knee joints was utilized for the foot raising in such elderly subjects, in order to compensate their weakened function of the ankle joint. Those results were integrated into a system in which the walking ability of the elderly is assessed through the conventional measurement regarding the contact between the foot and floor, and the computer simulation can display the picture of the target movement for improvement.
Key words: walking ability, elderly, assessment.
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F.N. Platt. A Measure of Information Processing and Memory, Primarily for Older Drivers. Gerontechnology 2002; 2(1): 92. A computer slide presentation has been developed to compare information processing time of individuals and populations of different age groups. Twenty driving scenes with decreasing time of presentation are the basis for this method. The subject must make a number of observations and decisions from roadway photographs. The maneuver to be performed and vehicle speed are given on each photo. The subject is asked to scan the scene and mirrors, use a turn signal, and select one of four speed options appropriate for the maneuver. The maneuver may be aborted if unsafe at the initial speed. Sound distractions may be added for certain subjects. Most persons require several minutes of practice with prompting. Instruction is given followed by practice on the twenty slides, projected at a slow pace. The final test slides are the same but the projection time is decreased every four slides. Subjects may be evaluated subjectively during instruction, the trial and final runs. The task is stopped when the subject cannot keep up with the faster slides. Few people are able to complete the task at the fastest rate. The minimum time of completion is scored and is compared with previous tests of the individual and with the total population. Fifty or more subjects, from 65 to 90+ years old, will be tested by November 2002. Some have disabilities and have stopped driving. Most subjects are college graduates with decades of driving experience. With modification, this method can provide measures of visual, mental and problem solving abilities of any patient. A similar program will be designed for driver licensing and driver education.
Key words: information processing, driving.
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M. Nambu, T. Suenaga, K. Nakajima, T. Tamura. Exercise System for the Elderly using Virtual Reality. Gerontechnology 2002; 2(1): 93. Physical exercise is important for the elderly to maintain their health condition, or for treatment of geriatric diseases. Then, some of the elderly is given the ergo-therapy in the hospital, and several equipments for the physical exercise at home have been produced. However, for the elderly who lives alone, it is difficult to control the strength or length of the exercise and to do the continuous daily exercise. Therefore, we developed the home exercise system using virtual reality system. This exercise system is composed with the horse-riding simulator, three-dimensional magnetic sensors, video projector, and a computer. The horse-riding simulator is a commercial product that mimics horse mobility such as walking and trotting, and a user who rides its sheet can feel like riding a horse. In addition the user can control the speed of the motion. The motion of the simulator is measured by the magnetic sensor and is recorded to the computer. A trainer can check the record of the exercise from the outside of the house. In addition, the computer made the virtual scene based on the motion of simulator and projected to the screen in front of the user. Compared with the simple video projection, this system is effective for the physical exercise at home, because the scene can be generated according to the motion of the simulator, season, landscape and user's favor, and special objects can be added to the scene to encourage the user to have daily exercise.

Key words: physical exercise, ergo-therapy, home care, horse-riding simulator, virtual reality.

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Assistive Devices and Quality of Life

E. Agree, V. Freedman, D. Wolf, J. Marcotte. Redefining Substitution: When Do Assistive Devices Take The Place Of Personal Help? Gerontechnology 2002; 2(1): 93.
The increased use of assistive technology in home based long-term care has great potential to increase independence, alleviate family burden, reduce unmet need, and lower expenditures. Yet, which groups substitute AT for informal or formal personal services remains poorly understood. The few studies that have examined both types of care use one to predict the other, assuming that they are independently acquired. However, decisions about AT and service use are not made in isolation, but rather are the joint product of health needs and opportunities for care. This paper examines the combination of assistive technology with formal and informal caregiving for older individuals living in the United States to understand which persons are more or less likely to substitute AT for personal care services. Data are from Phase 2 of the 1994-95 U.S. National Health Interview Survey Disability Supplement (NHIS-D2). We use a two stage approach that allows for both the simultaneity of decision-making, and also the large number of persons who use only one form of assistance. Results from the paired Tobit and Probit models confirm that the use of AT is very highly correlated with the use of both types of care, but especially with formal care. We also find that those who are unmarried and the highly educated are most likely to substitute AT for informal care, while those with cognitive impairment substitute both types of personal care services for AT.
Key words: long-term care, substitution; informal caregiving.
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H. Neveryd, J. Molenbroek, P. Panek. FRR - Friendly Rest Rooms for Elderly and Disabled Persons - A User Centered R&D Project. Gerontechnology 2002; 2(1): 94.
Background: Friendly Rest Rooms (FRR) is a project financed by the Quality of Life Program in the European Union's 5th Framework. A consortium of 11 partners from 8 countries initiated the 3-year project that started in January 2002. Aim: The purpose of the FRR project is to empower elderly and disabled persons to use public restrooms even with an increasing level of disability and to support secondary users by providing an innovative, user-friendly and highly adaptable, integrated smart toilet system. Methods: User centered design with an emphasis on the following points: (i) Build a database of user responses on the progressing design steps, collected by means of questionnaires, computer-based interviews, workshops and in-depth interviews. (ii) Design various stages of prototypes with increasing levels of functionality. Critical design aspects have already been defined as the result of workshops in Austria, Greece and Sweden. These prototypes function as focal data-collection elements in the design process leading to progressive accommodations of the devices to the requirements of a variety of individual users. (iii) This design process is a collaboration of three different "owners" of knowledge, namely user-representatives, engineers, and project managers, providing a unique infrastructure of knowledge for the more traditional R&D processes. (iv) The project will create a special set of services for the participants of this unique R&D community, something similar to services that may be found in learning and design workshops. See www.frr-consortium.org for additional information.
Key words: restroom, elderly, disabled, user centered, data base, prototype.
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J. Niitsuma, N. Tsuda, N. Tejima. Amusement for the Elderly Using Radio-controlled Cars. Gerontechnology 2002; 2(1): 95. Our ultimate goal is to develop a theme park which is suitable for the elderly and which can contribute to maintaining their health. The purpose of this study was to investigate the characteristics of enjoyable amusements among the elderly. Nineteen elderly subjects from 60 to 75 years of age experimentally played three games with a radio-controlled car. Only one subject was female while 18 were male. This is because most of the initial female elderly volunteers had no interest in radio-controlled cars. All subjects were beginners, so they were given sufficient driving practice before the experiment. The drivability of the radio-controlled car was adjusted for the elderly subjects. The games involved stabbing six balloons at random or in due order with a needle attached to the car within four minutes. The score was counted as the number of popped balloons by each individual. The subjects walked around the experimental field of 10 meters long and 4 meters wide while operating the car. After the experiment, the subjects were interviewed. It was found that all of the subjects enjoyed the games and responded that they would like to play them again. The most difficult game was most enjoyable for 9 subjects out of 19, while the easiest was most enjoyable for 7 subjects. No statistical relation was observed between the most enjoyable game and the score obtained for it. Other games, such as ludo, were also played by the elderly subjects experimentally.
Key words: play therapy, theme park, game, elderly.
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K. Ishihara, S. Ishihara, M. Nagamachi. Relations between visual aging and daily activities: Questionnaire study by 2,800 elderly subjects. Gerontechnology 2002; 2(1): 95. A questionnaire study, involving more than 2,800 elderly people aged 60 years and over and who lived at home, was conducted to investigate the relationship between daily activities and visual ability. The activities of daily living (ADLs) measured the ability of elderly participants to bathing, dressing, using a toilet, and walking up and down stairs. They were also asked whether handrails were required in performing those activities. The instrumental activities of daily living (IADLs) measured the ability of subjects to pick up coins, manage monthly financial matters, use the telephone, and take medication as recommended. Visual abilities were assessed by answering questions relating to resolution, focus, adaptation to bright or dim lighting, dynamic acuity, distance perception, and color vision. Logistic regression analysis was used to reveal associations between the necessity of handrails for performing daily activities and the age and gender of the subjects, as well as the degree of difficulty with which they performed visual activities. Older subjects and female subjects used handrails significantly more for bathing or for walking up and down stairs than other subjects. In terms of visual ability, dynamic acuity and needing time to adjust to bright or dim lighting were significantly associated with more use of handrails in bathing, using the toilet, and walking up and down stairs. The relations between difficulties in performing IADLs and age, gender, and vision were also determined by using logistic regression analysis. The results indicated that elderly participants who had either problems with distance perception or experienced yellow color vision also tended to have difficulties in picking up coins, using the telephone, and taking medication as recommended. In addition, adaptation and dynamic acuity were associated with difficulty in managing monthly financial matters.
Key words: elder vision, ADL, IADL, handrail, logistic regression.
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How Does Information Technology Help the US Family? A Symposium

G. G. Hunt. US caregiving demographics and recent trends in increasing use of information technology by caregivers. Gerontechnology 2002; 2(1):96. This panel will present an overview of several information technology projects that support family caregivers of older people. Ms Hunt directs a nonprofit coalition of 33 national organizations that conducts research and develops programs for family caregivers. She will moderate the panel as well as describe US caregiving demographics and recent trends in increasing use of information technology by caregivers.
Key words: family caregiver, aging, support system, internet services.
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S. Czaja. The structure and findings of the REACH caregiver program that supports in-home family caregivers through a telephonic support/counseling system. Gerontechnology 2002; 2(1): 96. Dr Czaja will describe the structure and findings of the REACH caregiver program that supports in-home family caregivers through a telephonic support / counseling system.
Key words: family caregiver, telephonic support.
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C. Smith. Research at the University of Kansas Medical Center on telehealth as a support to family caregivers, robotics for home care, and technology supporting discharge planning. Gerontechnology 2002; 2(1): 96. Dr Smith will describe her research at the University of Kansas Medical Center on telehealth as a support to family caregivers, robotics for home care, and technology supporting discharge planning.
Key words: family caregivers, aging, support system, internet services.
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P. Juhn. Carepanion.com, a new caregiving dotcom that provides a wide variety of information to family caregivers through a comprehensive Internet website. Gerontechnology 2002; 2(1): 96. Dr Juhn will describe his work with Carepanion.com, a new caregiving dotcom that provides a wide variety of information to family caregivers through a comprehensive Internet website.
Key words: caregiver, internet services.
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K. Kelly. A best practices monograph (published summer 2002) that showcases 3-4 projects using technology in a variety of settings benefiting family caregivers (Family Caregiver Alliance). Gerontechnology 2002; 2(1): 96. Kathleen Kelly who heads the Family Caregiver Alliance in San Francisco will present on a best practices monograph (published summer 2002) that showcases 3-4 projects using technology in a variety of settings benefiting family caregivers.
Key words: family caregiver, aging, support system.
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Enhancing Mobility

R.A. Mayolo, J. Grimm. Assistive Technology and Independence In An Older Population. Gerontechnology 2002; 2(1): 97. Assistive technology can play a major role in the life of older adults, providing tools to improve their quality of life and increasing their access to activities of daily living within their homes and their communities. For many older adults, the use of assistive technology can mean the difference between remaining in their own homes and institutionalization. Information on the thousands of assistive technology devices and services is available through the Assistive Technology Act projects in all 50 states but older adults and their service providers are often unaware of this nationwide program or the benefits it can provide to older adults. The Assistive Technology (AT) Demonstration Clinic was developed by the West Virginia Assistive Tech Act project to provide a comprehensive assistive technology assessment for older adults and others. The assessments are conducted by an interdisciplinary team of providers who work with the client, the family, and each other in one place, at one time. Older adults are referred following a stroke, hip fracture, or other event that has minimized their ability to live independently. The outcome of their clinic visit is a list of recommendations that addresses both the individual's physical ability to live at home and the home's ability to accommodate the needs of the individual. In addition to maximizing the individual's independence, the Clinic has increased communication among service providers, provided support for caregivers and case managers, and served as a model that has now been replicated in two other rural West Virginia communities.
Key words: assistive technology, independent living, older adults, assessment.
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N. *Tejima, H. Bunki. Feasibility of Measuring the Volition Level in Elderly Subjects. Gerontechnology 2002; 2(1): 97.* The purpose of this study is to find a method for objectively measuring the volition level of the elderly during their gait training, for developing a gait training system with an audio encouragement function. First, both the walking speed and tempo of eleven elderly subjects with various difficulties in walking were experimentally measured with a video camera under music stimulation with normal and faster tempo. After the experiments, they were interviewed for evaluating their volition level subjectively. Contrary to our prediction, the results revealed no correlation between the walking speed or tempo and the subjects' volition level to undergo the gait training physical therapy. Most of the subjects seemed to slow down not because of their lowering enthusiasm but because of fatigue. A positive influence of the music upon the subjects' psychology was confirmed. Second, the Fm theta activities of EEG signals were experimentally measured while five young volunteers performed psychological tasks at a desk. After each task the subjects replied to a questionnaire about their mental condition. These Fm theta activities seemed to be related to the subjects' volition level, however, their high level of deviation and the influence of artifacts minimized their usefulness for this purpose.
Key words: virtual reality, music therapy, aroma therapy, EEG, encouragement.
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F. Slevin, G. Lacey. An intelligent walker for people with reduced mobility. Gerontechnology 2002; 2(1): 98. The value of the device should be measured by the outcomes it delivers for the user, not by its technical complexity. The authors have developed a mobility support system aimed at increasing the self-sufficiency and physical fitness of older adults who experience both impaired vision and reduced mobility. The device uses advanced robotics and artificial intelligence to build a visual guidance system into a robust walker. The device has two key features: automatic collision avoidance and landmark recognition: it communicates with the user via voice messages and haptic feedback. While the device is an extremely complex robot, the real sophistication – and value – of the device is in the simplicity of its context-sensitive user interface. Twelve separate user studies and tests have been carried out with representative users. Early tests on prototypes focused on usability and especially on the user interface. Feedback from users indicated a preference for normal voice messages and led to the use of bicycle-style handlebars (both of which felt immediately familiar and learnable). Users also focused the developers' attention on the external design of the device. While appreciating that the functionality of the device would enable them to walk safely and independently, users would reject a device whose styling did not reflect their own positive spirit of confidence and independence. As the users demonstrated: aging is a change in lifestyle, not a medical condition.
Key words: mobility support, self-sufficiency, fitness, impaired vision, robotics, usability.
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J.-M. Belda-Lois, R. Porcar-Seder, R. Poveda-Puente, R. Barberà-Guillem. SEPAM / IBV: An expert system for assisted prescription of technical aids for mobility. Gerontechnology 2002; 2(1):98. Choosing the most convenient mobility aid requires specific knowledge and sufficient experience on medical and social topics. Professionals involved in the prescription process come from different backgrounds. Nonetheless, it is not uncommon to find people with disabilities using a wrong technical aid, using a technical aid in an inappropriate manner or even not using it at all. The lack of specific prescriptive recommendations in the international and European standards adds to this problem. An expert system (SEPAM/IBV) has been created, aimed at making prescription and subsequent selection of technical aids for mobility more reliable and procedural. A key factor is user involvement, therefore providing reliable input on user needs early in the process. The software developed relies on different decision tables based on two kinds of databases. On the one hand, relevant product features. On the other hand, relevant components of user profile (disability, environment, and user preferences). These databases are related in a hierarchical way by means of a set of quantitative and qualitative expert rules providing the level of adequacy of each technical aid and constructive solution as a function of the functional characteristics of the user, intended use, and environment. In addition to the core of the application, valuable help is provided online, including technical recommendations regarding safety, functionality, and structural requirements. SEPAM produces a structured report consisting of user profile and product selection recommendations. Such prescription draft can then be discussed with the user and, later on, can also be shown at the orthopedic salespoint.
Key words: assistive technology, technical aids, mobility, user participation, expert system.
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G. Fernie, P. Holliday, A. Milhailidis, R. Rolfson. Does sideways movement increase manuverability in a powered wheelchair? Gerontechnology 2002; 2(1): 99. The ability for powered wheelchair users to manoeuvre in an indoor environment is often challenging because of the small spaces and the effort required to complete daily tasks. We are investigating whether the sideways movement capabilities of the Rocket powered wheelchair help to reduce this required effort. Preliminary trials were conducted which compared the reaching ability of a user as a function of access width. Four powered wheelchairs, including the Rocket, were tested. The user was able to reach the farthest along a counter top in a four foot corridor when using the sideways capability of the Rocket. Results showing reaching performance as a function of access width will be presented. The next stage of this project is to observe the performance of the Rocket in a home setting in order to determine the effects of sideways movement on the completion of activities of daily living. Disabled, non-wheelchair users will be taught to operate the Rocket and one other wheelchair in their own home environment. They will be asked to perform a series of tasks in each room and data will be collected to determine the perceived effort of each user. Other measurements that prove to be useful in determining the mobility and manoeuvrability of a wheelchair will also be developed and tested during these trials. The results of these trials and conclusions on the types of measurements that are useful will be presented.

Key words: mobility, manoeuvrability, powered wheelchair.

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Navigating the World Wide Web

R. Pak. W. Rogers, A. D. Fisk. An investigation of the relationship between spatial abilities and hypertext navigation-It's not as simple as it seems! Gerontechnology 2(1): 100. Previous studies have shown a consistent and positive relationship between spatial abilities (e.g., spatial orientation) and performance in a navigation task (e.g., task completion time, errors). The current study examined this relationship in an older and younger adult sample in a hypertext navigation task. The participants completed a battery of ability tests and completed a hypertext navigation task similar to browsing the World Wide Web. The total amount of time spent on a page as well as the number of times the participant used the 'back' button were measured. Spatial visualization was a significant predictor of performance in young adults, even after the influence of other abilities was removed. In older adults, spatial orientation was found to be strongly predictive of performance after the influence of other abilities were removed. The current results suggest that the relationship between spatial abilities and navigation performance is more complex than previous research suggests, involving age, and possibly experience. The results of these studies can inform computer interface designers into possible ways individual differences in the use of computer interfaces can be ameliorated.
Key words: spatial ability, visualization, orientation, hypertext, computer task performance.
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A.J. Stronge, W. Rogers, A. D. Fisk Understanding Decision-Action Processes for Younger and Older Adults. Gerontechnology 2(1):100. Information search and retrieval on the World Wide Web is an example of a complex problem solving task. Using a structured interview approach, the present study assessed the knowledge of 16 younger and 16 older adult experienced Web users. The structured interview consisted of questions on a variety of topics such as participants' knowledge of the strategies they use to find information, how participants choose and learn to use a Web search tool, and how they determine whether or not a website is credible. In addition, participants were presented with hypothetical search scenarios varying in their level of complexity (i.e., the number of website hits received after a hypothetical search). This study identified the different ways in which participants approach the task of finding information on the Web. In this presentation, we will detail the strategies used by participants with a focus on the qualitative similarities and differences between younger and older adults.
Key words: World Wide Web, structured Interview, problem solving strategy.
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R. Ownby, S. Czaja. Problems in Web Page Design for the Elderly. Gerontechnology 2(1):101. This paper presents an overview of current problems in web site design for the elderly. Using the guidelines for web site design for the elderly recently issued by the National Institute on Aging and the National Library of Medicine and the methods recommended by the Web Accessibility Initiative of the World Wide Web Consortium, we evaluated web sites that provide general information for retired persons, medical information of interest to older adults and the elderly, and financial information sites. These three categories were chosen because of evidence that these are information areas of particular relevance to older adults. Our evaluation shows that older adults and the elderly are likely to encounter numerous obstacles in attempting to access information on the Web. These obstacles can be classed in three main categories: visual, mechanical, and memory. Examples of visual obstacles include excessively complex web pages that are confusing, and pages that use unusual fonts and low-contrast color schemes. Mechanical obstacles are present on pages that provide small target areas for mouse clicks or that require scrolling to access content, have difficult to use pull down boxes, or require text input. Sites that present memory obstacles use poorly-designed navigation schemes that demand good short term memory on the part of users, rather than providing clear cues to the position of a page in the site. We conclude with additional recommendations for designers of web sites likely to be accessed by the elderly.
Key words: web site design, elderly, geriatrics.
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N. Bitterman, I. Shalev. The Effect Of Link Design On WWW Navigation Of Elderly People. Gerontechnology 2(1):101. The aim of this study was to investigate fitness of various configurations of links on performance of elderly people (in comparison to young person) using the Internet. Three experimental tourist websites (Rome, Prague and London) with integrated hidden tracking programs were built. Nine different prototypes of links were installed into the websites; 3 different configurations of links on each website. Two groups of experienced Internet users participated: elderly people (69±1.6 years) and young people (29+0.9 years) (n=12 for each group). The participants were asked to navigate through the experimental websites and to answer specific questions, based on the information within the websites. Parameters for scoring of the links were: time for task completion (absolute & relative), number of errors, time per page, number of steps, satisfaction, and personal preferences. Time for task completion was statistically longer for elderly person compared to young participants. There were no differences in number of errors performed or in number of pages visited in the two age groups. The best scores were for links of the type: icon or horizontal text list. The worst scores were for links of bulleted list and list box with 'go' button. Our results suggest that older adults can perform the Internet as well as younger people, even though slower. However proper links selection may reduce time navigation in elderly users.
Key words: World Wide Web, navigation, elderly people, aging.
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Gerontechnology Issues

J.E.M.H. van Bronswijk, H. Bouma. Gerontechnology for Health: The Making of a Discipline. Gerontechnology 2002; 2(1): 102. Gerontechnology has become a discipline within a time period of only 12 years. Three partly correlated societal changes cleared the way: aging of the population, rapid development of Information and Communication Technologies (ICT), and the emerging knowledge-based society. When in the late eighties of the last century, the International Journal of Technology & Aging (ISSN 0891-4478) was founded, it declared to serve the academic, professional, and policymakers community by addressing the dramatic changes resulting from an aging world. Focus was on health care, robotics, automated homes, and other technologies to aid older persons with disabilities. The journal did not last. The notion 'Gero(n)technology' appeared as a shorthand or framework on technology and aging in 1992, and at first also aimed at improving daily functioning of the elderly. Society changed at a rising pace powered by ICT applications that democratized knowledge. We are becoming a risk society with expanding civil liabilities and individual rights (Post-Industrial Society). Universal Design became a hot topic within the European Union. The gerontechnology concept followed, and by 2000, it had expanded to a discipline for a favourable technological environment for individual healthy maturing and long-term vitality; a new branch of the ancient discipline of public health engineering. This trend could lead to a new civic right: healthy aging for all through dedicated gerontechnological applications.
Key Words: aging, knowledge based society, risk society, user-orientation, ICT, universal design.
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T. Petäkoski-Hult, S. Belitz, J. Mantere, H. Strömberg. Elderly people as users of information technology. Gerontechnology 2002; 2(1): 102. The population in Europe and almost every industrial country is ageing. Because of that there is a need to develop information technology solutions for elderly people also. European Commission accepted an Initiative, which takes this under consideration. According to the W3C Web Accessibility Initiative public www-services should be available for all including people with special needs. Aim of the project: This chapter describes the aims of a project called VIRIKE, Entertainment and services - elderly people meet in the net. Project has four important objectives: (i) to find out those services elderly people are interested in, (ii) to carry out user processes which support the involvement of elderly people, (iii) to build up a prototype that takes into account the opinions and needs that user group have in the context of www-sites and digital TV environment, (iv) to find out important usability issues for the further development work. Results: So far researchers have interviewed 20 people over age 60. During the interviews the daily living of the group was discussed. These discussions were taped and the written out afterwards. The user group included people who needed already some home services and people who were independent. Some of them were taking care of their mate because of a dementia or some other disease. Some used assistive devices in their daily living. Some were familiar with computers. As working methods were used also scenarios and focus group discussions. Scenarios were written on the basis of interviews. On the basis of the results design guidelines will be done and used when designing www-services and digital TV environment for elderly people.
Key Words: elderly, usability, World Wide Web, digital TV, home services, guideline.
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G. Lesnoff-Caravaglia. Technology and Aging: What's Out There and What is being used. Gerontechnology 2002; 2(1):103. The introduction of advanced technologies into a world increasingly populated by persons aged 70 and older has contributed to the development of new resources for use in areas such as long-term care, acute care settings, home environments, the workplace, and recreation. Despite the proliferation of both high technology (robotics, automation) and low technology (personal aids, prosthetic environments), their utilization has been limited. This study was conducted to determine whether technologies which have been on the market for at least five years or longer, are currently being utilized in the two major institutions providing health care to older adults: the long-term care facility and the hospital. A questionnaire was distributed to 134 facilities: 43 nursing homes and 91 hospitals. The questionnaire included 45 items, covering categories of assistive devices such as a variety of alarms, advanced bathing systems, speech aids, urinary/fecal controls, and wheelchair accessories. Results indicated that although a high percentage of the facilities were aware of the existence of such technologies, their usage rate was extremely low. Greatest utilization was shown in areas such as walking aids, urinary and fecal controls, and wheelchair accessories. Information regarding such devices was more common among nursing homes than hospital settings. Hospitals, however, were more apt to employ the devices in patient care. Limited utilization and lack of information concerning available technologies among healthcare providers can dramatically hamper the well-being of the elderly and significantly erode lifestyle options and treatment procedures.
Key Words: technology, aging, nursing homes, hospitals, utilization.
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R. Pieper. Gerontechnological paradigms and their ethical dimensions. Gerontechnology 2002; 2(1):103. Gerontechnology is an applied, interdisciplinary field of research and development that is only beginning to articulate its knowledge in more integrated, if not unified approaches. Theoretical frameworks are still strongly determined by a specific disciplinary research background and theoretical traditions. This diversity makes it difficult to compare research results and to assess progress and implications of approaches. This paper aims at contributing to the integration of gerontechnology by providing a systematic framework relating different approaches. Drawing on the philosophy of science and the concept of paradigm as a disciplinary matrix (Thomas Kuhn), four systematic elements are distinguished and employed in a typology of gerontechnological paradigms: interpretative frames, basic or formal models, methods of research, and reference cases of application. In a second step the ethical dimension of these paradigms is explored to draw attention to - not necessarily implied, but traditionally imbedded - normative features of the paradigms to raise awareness to practical aspects of paradigm choices.
Key Words: paradigms, gerontechnology, theoretical framework, ethical issue.
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Round Table discussion on Monodisciplinarity, Interdisciplinarity, and Multidisciplinarity in Gerotechnology

S. Kwon. The disciplinarity debate. Gerontechnology 2002; 2(1): 104. Different technologies for different elderly call for different profiles of practitioners', researchers' and providers' involvement for optimal usage by the consumers: Gerotechnology is indeed a most heterogeneous field. In this highly interactive session, presenters will describe services and products at the interface of Technology and Aging, they will comment on the interdisciplinary components in their work and discuss them with the audience. The session also serves as an open invitation by GSA-TAG (Gerontological Society of America – Technology and Aging) to conference attendees to collaborate both within their respective work settings and with different international research groups, interest groups and organizations.
Key words: gerontechnology, interdisciplinary, technology and aging
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D. Kutzik, A. Glascock. Web-based Behavioral Monitoring: Potential and Actualities. Gerontechnology 2002; 2(1): 104. Kutzik and Glascock discuss the problems and potentials of web-based non-obtrusive monitoring of activities and medical conditions of impaired elderly persons. Several approaches are examined, including their VirtuCare scheme. Design philosophies, user values and likely impacts are compared and contrasted from a sociological and anthropological perspective.
Key words: aging-in-place, monitoring, user orientation, design.
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R. Olsen. Technology for Aging in Place and Access to Leisure: Aids for the Disabled and Cognitively Challenged. Gerontechnology 2002; 2(1): 104. Richard V. Olsen presents on two different topics: The use of low-level assistive technologies to support aging in place with a disability and the Media Memory Lane study, funded by the Fan Fox and Leslie R. Samuels Foundation, where technology is being used to improve access to leisure activities (i.e.-music and videos) for older people with dementia who can no longer operate standard electronic equipment.
Key words: aging-in-place, assistive technology.
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M. Parker. Smart Housing Developments in the U.S. Gerontechnology 2002; 2(1): 104-105. Mary Hamil Parker discusses interdisciplinary approaches to the uses of technology in the United States to develop living environments that accommodate the needs of aging and disabled people. One approach has been to construct new housing incorporating supportive technologies. However, most people would prefer to remain in their existing homes as they age and experience increased disability. Future Home is a 'smart house'

that represents retrofit and renovation with new technologies to meet existing needs and plan for future disability of an adult with disabilities.
Key words: interdisciplinarity, aging-in-place, domotics, smart housing, assistive technology.
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H. Russo. Overview of Technology - Telemedicine Developments in the U.S. Gerontechnology 2002; 2(1): 105. Russo reviews recent advances in electronic telecommunication technologies and she presents new opportunities for minimizing distances between and among caregivers, informational and educational services, and elderly receiving health care. This presentation provides an overview of current cutting-edge interdisciplinary research focused on applying the Internet, video, audio, and store & forward technology to promote successful aging in America. Consideration to cultural differences, literacy, recognition of learning styles and effects of normal aging on the human body will be discussed as they relate to the design of devices and programs to meet the needs of elderly now and in the future.
Key words: interdisciplinarity, communication, caregiver, literacy, learning style, World Wide Web
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B. Tran. Biomedical Engineering and Nursing: Introducing Telehealth Technology for Tele-Support of At-Home Stroke Caregivers. Gerontechnology 2002; 2(1): 105. Tran reports on field studies of telehealth and videophone technology in homes of elderly stroke caregivers. Their acceptance and barriers to implementation are scrutinized in terms of optimization of ICT services by the collaboration of different disciplines.
Key words: World Wide Web, aging-in-place, domotics, smart housing, telehealth.
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J. Watzke. Creating Assistive Technology Prototypes Using a True Multidisciplinary Team Approach: Trials & Tribulations from the Health Technology Research Group at the BCIT. Gerontechnology 2002; 2(1): 105. Watzke reports on work from the British Columbia Institute of Technology (BCIT), Canada. The Health Technology Research Group (HTRG), one part of BCIT's 55 person research center, - has developed an expertise in the areas of: (i) medical and assistive device prototype development; (ii) evaluation of such devices and (iii) injury prevention research for assorted 'at risk' health care workers. Because the HTRG provides R & D services that span the full continuum from initial concept (e.g., prototype development) to commercialization, a truly interdisciplinary team is employed. Issues of (i) project management, (ii) team skills' sets, (iii) creative, functional, and economic constraints of assistive device development and evaluation, and (iv) the challenges of trying to help the clients and their devices to be successful in the market will be presented.
Key words: aging-in-place, assistive technology, product R&D.
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Computer Input Devices

A.C. McLaughlin, J. Whittle, W. Rogers, A. Fisk. Determining age-related touch screen usability: Changes in Fitts' Law as a result of control type. Gerontechnology 2002; 2(1): 106. We examine the generality of Fitts' Law to input controls on a touchscreen interface. Fitts' Law predicts human psychomotor actions based on target distance and size. We manipulated the distance of the controls from one another, the size of the control, and the proximity of the controls to each other. Control type was also manipulated (i.e., touchscreen buttons and scroll-bars), which have not been previously evaluated. Examining overall performance as well as performance on the individual controls tested the generality of Fitts' law. Nineteen undergraduate students (aged 18 - 27) and 20 older adults (aged 51-70) completed the study. An extensive number of data points were collected from each participant for each distance by size combination. For the standard controls, performance at the group levels generally conformed to expectations of Fitts' Law. Not surprisingly, differences in movement speed were found between younger and older adults. The stacked and un-stacked configurations of controls yielded different functions, most likely due to the ability to reduce initial movement aiming requirements. Performance with scroll-bars was not well described by Fitts' Law and is discussed in terms of initial ballistic movement requirements combined with subsequent maintenance of movement requirements for these types of input controls. The data are also discussed in terms of age-related usability analyses for HCI input decisions.
Key words: Fitts' Law, touch screen, input device, scroll-bar, HCI.
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C.-C. Lin. A Comparison of Direct and Indirect Input Device for Older Adults. Gerontechnology 2002; 2(1): 106. The comparison of older adults' performance between direct input devices (e.g., touch screen) and indirect input devices (e.g., mouse) has been discussed in previous research (e.g., Kelley & Charness, 1995). The current study examined performance on the difference as a function of device (touch screen vs. rotary encoder) and interface elements or controls (e.g., slider bars and up-down buttons). Forty older adults (20 in each device, aged 51-65) performed on an entertainment system simulator using one of the two devices. Response times for each task and each control were recorded. In general, participants performed tasks more quickly with the touch screen; however, examining the micro level performance on individual controls demonstrated a control by input device interaction. Participants did not benefit from the touch screen when performing on slider controls and up-down buttons. We divided these two controls into long scales and short scales and found that short sliders and long up-down buttons benefited from the encoder. There was no significant difference between devices when performing long sliders and short up-down buttons. We concluded that controls that require precision or numerous button-pressings are faster to use with the encoder. In addition, the learning effect of the encoder group was steeper than the touch screen group. The results of this study provide guidance for selecting input devices to enhance usability for older adults.
Key words: computer literacy, touch screen, user interface.
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J. Sanchez. The performance effects of scrolling on older users in the WWW. Gerontechnology 2002; 2(1): 107. Scrolling is often considered an undesirable feature in web sites. It has been shown in previous studies that scrolling can negatively affect the performance and satisfaction of users. With the older population, scrolling can even be more of challenging task. The purpose of the study was to test the performance effects that scrolling had on older users as opposed to younger users. Two web sites were designed with the same content; one was laid out in a manner in which scrolling was necessary and the other in a style in which no scrolling was possible. Forty-eight participants were involved; half were between the ages of 18-40 and the other half were above 60. Twelve of the older users performed the task on the scrolling web site and the other twelve on the non-scrolling one; the same experimental design was used for the young users. Results indicated that there were significant differences in the amount of time your older spent accomplishing the task in the site with scrolling than in the non-scrolling site ($p<0.05$). There was no significant difference between the times spent by the young users in either site ($p>0.05$). There was a significant difference between the times spent by young and older users ($p<0.05$). The study indicates that even minimal amounts of scrolling have significant effects on the older population. It also indicates that scrolling is more detrimental to the performance of older users than young users.
Key words: user interface, user satisfaction, scrolling.
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H. Umemuro, M. Takayama. Computer Keyboard with Dynamic Key Layout Change Gerontechnology 2(1): 107. Key layouts of computer keyboards might be desirable to be changed according to the factors such as users' age and experience, kinds of tasks, languages, and characters used. However, most of mechanical keyboards today are based on standard "QWERTY" layout and it is generally difficult to change key layouts freely and dynamically. One possible solution is to use touch screen technology along with software keyboard. However it is also reported that reduced tactical feedback to fingers may lead to low usability, and that users prefer to use mechanical keyboard rather than touch screen for the tasks that require many inputs. The purpose of this study is to propose a mechanical keyboard that is able to change its key layout dynamically. The proposed keyboard is also capable to change colors of keys, to flash keys to attract users' attention, and to hide unnecessary keys to avoid errors. The proposed keyboard was evaluated both in performance and subjective evaluation in comparison with standard keyboard, one- and two-touch screen configurations. Ten young adults aged 22 to 23 and ten older adults aged 51 to 73 participated. In older group, error rate was the smallest with the proposed keyboard and two-touch screen configuration, while that was the largest with the proposed keyboard in younger group. Older subjects evaluated the proposed keyboard comparable to one- and two-touch screen configurations and higher than standard keyboard in dimensions of satisfaction; learnability and efficiency, while younger subjects showed more complicated evaluations across conditions.
Key words: interface, adaptive interaction, usability, user diversity, multilingual.
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Product Hazards and Product Development

H. Ogi. Technology for Universality Evaluation of Industrial Products. Gerontechnology 2002; 2(1): 108. Through the Research Program on a Universal Design Methodology (1997-1999), we had built and established several breakdown concepts in order to joint the research activities with the aim of the research program, i.e., creating the new social conditions of the continuous integration toward "the Society for All". We called three of these concepts (1) practical type test, (2) scientific type test, (3) ecological type test (H.Ogi,2001). We have continued the research with the focus on the third one. Ecological type test takes as research targets the human requirements on the combinations of the objectives. If people's life styles are allowed to be in so wide variety, the improvement will get the objectives through the insight into the combinatorial structure of the life system, the living behavior, the living system, and the living societies. In this paper, we report several recent findings.
Key words: universal design, evaluation, industrial products, ageing, housing.
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Ogi.H. Evaluation Problems Concerning Universality of the Products and the Living Environments in Ageing Society, Proceedings of the International Workshop on Gerontechnology; 2001.

C.H. Doevendans, D. Chaney, S. Katz. Ageing, Technology and the Post-Industrial Society. Gerontechnology 2002; 2(1): 108. We are in the middle of an evolution from the industrial to the post-industrial society. The city, formerly the location of industrial production, becomes a landscape for consumption, recreation, and shopping. No longer will the future city function as an organic whole of residential areas with daily shopping on walking distance. Increased mobility has taken away this necessity. Mobility even has become a value at its own. Because of individualization new tastes and lifestyles have developed. People are pressed to choose their own lifestyle influenced by marketing and consumerism. Technology is not anymore just assistive, making life more comfortable. Technology has become an ontological issue for all age classes and both genders. Technical-instrumental approaches presuppose a certain way of living. This becomes clear in the effect of ICT on daily life, we partly live in virtual communities. ICT also has great impact on collective life. The emergence of a knowledge-based society becomes apparent. Paradoxically, society is also considered to be a risk society. And these risks should be managed. Still society is organised around the unknowable consequences of policies and social practices. Gerontechnology should redirect its aims to follow the evolution from the industrial to the post-industrial society, as ageing of society is an integral part of this evolution. In this presentation questions are raised concerning the relationships between life course and lifestyle, identity and ageing, consumerism and technology.
Key words: lifestyle, life course, ageing, post-industrial society, ICT, ontological issue.
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T.A. Nichols, C. Mayhorn, W. Rogers, A. Fisk. Ecology of Product Hazards in the Older Adult Home. Hazard Awareness and warning perception. Gerontechnology 2002; 2(1):108-109. Older adults are more susceptible to home injury than young adults, and

these injuries can be more severe. Understanding hazards in older adults' homes and their behaviors regarding hazardous products is a necessary step towards providing training and effective design to reduce hazards. Our recent research has demonstrated that older adults interact with a wide range of products in the home. However, previous research on hazards in the older adult home has focused primarily on structural aspects, such as bathtubs and staircases. The present study focused on the origin of older adults' knowledge about hazardous products, also addressing older adults' beliefs about the necessity of warnings with hazardous products. Forty-five older adults participated in six focus groups, discussing issues of home hazards and warnings. Based on participants' response patterns from the focus groups, several conclusions emerge. Participants demonstrated awareness of a wide range of products and hazards. They overwhelmingly agreed that warnings were a necessary aspect of hazardous products, to some extent even supporting the inclusion of warnings on products that they reported did not come with warnings (e.g., bathtubs, windows, house shoes). Furthermore, older adults reported that personal or secondary experience was an important means of acquiring hazard knowledge. Hence, the use of narrative vignettes may be useful for designing effective warnings or training about hazards, as these vignettes may serve as a proxy for actual experience.
Key words: older adults, hazard awareness, warning perception, focus group.
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S. Becker, H. Mollenkopf. Guidelines for senior friendly product development. Gerontechnology 2002; 2(1): 109. The interdisciplinary research group sentha ("Every day technologies for senior households") focuses on the analysis of senior friendly product development. This group is a synthesis of technicians, designers, and social scientists funded by the German Research Foundation. The social scientists are responsible for supervision and consultation with regards to the development and evaluation of newly designed products. The aim is to develop an appropriate evaluation strategy suited to generate results with such high standard that they can be transferred into the fields of construction or engineering technology, and therefore used as a general guideline for the development of senior friendly products. The evaluation strategy was designed as a feedback process in two steps. The first step included the evaluation of product ideas derived from an initial interdisciplinary development phase. The results showed that despite intensive cooperation between the disciplines and participation of potential users, the products did not adequately meet criteria for senior friendliness. Based on the assumption that the participation of seniors is very important to product development, we elaborated a structured developmental matrix. In this second step, different development processes were implemented by varying the participation of the seniors systematically in terms of their information level about technical development within the research group and the time point of inclusion in the developmental process. The outcome evaluation of the second development phase affords insights about the most effective methods for the development of senior friendly products.
Key words: product development, senior friendliness, evaluation, user participation.
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Automation and Monitoring

M.E. Pollack. An Intelligent, Adaptive Cognitive Orthotic. Gerontechnology 2002; 2(1): 110. Prospective memory decline in the older adult can interfere with the consistent performance of routine activities, including ADLs and IADLs. Cognitive orthotics can provide support to older people with memory deficits, by providing reminders about activities that are necessary to maintain health and well-being. However, systems that merely provide reminders for a fixed set of activities at fixed times may not adequately serve the needs of this population. We are designing Autominder, an intelligent cognitive orthotic, to provide adaptive reminders based on the evolving needs and actions of its user. Autominder maintains a model of the user's "plan", i.e., the activities he or she is supposed to perform, along with constraints on the timing and/or method of performance. It also maintains a model of the user's actual activities, which it infers based on sensor inputs. When these two models diverge, Autominder reasons about whether and when a reminder should be issued, making the decision so as to balance the needs to (i) ensure that the user is aware of the activities he or she should perform; (ii) avoid introducing inefficiency into the user's activities; (iii) avoid annoying the user; and (iv) avoid making the user overly reliant on the reminders. To achieve these goals, we use a range of Artificial Intelligence (AI) techniques, including planning, temporal reasoning, execution monitoring, and reasoning under uncertainty. An initial prototype version of Autominder has been developed and deployed on a mobile robot; preliminary field testing was done at a retirement community in Western Pennsylvania.
Key words: cognitive orthotics, reminder system, artificial intelligence, mobile robot.
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A. Sixsmith, N. Johnson. SIMBAD: Smart Inactivity Monitor using Array-based Detector. Gerontechnology 2002; 2(1): 110. Falls represent a major health hazard for the elderly, as well as being one of the major obstacles to independent living. Increasingly, older people are living alone with only limited support from formal and informal sources of help assistance. While the privacy of the individual should be respected, it also has to be recognized that this increases the risk of being alone when a fall occurs. Community alarm systems allow someone in difficulties to raise an alarm in a control centre by pushing a button on a special telephone or on a pendant device worn on their person. However, these are of little value if the person is unable to raise the alarm themselves. SIMBAD is a low-cost, intelligent fall detector that will trigger an alarm and appropriate response, even if the person is incapacitated. SIMBAD achieves this by using array-based passive infrared technology. This novel low-cost technology is capable of reliably locating and tracking a thermal target within the sensor's field of view, providing size, location, and velocity information. Thus the sensor provides a much richer source of data than current home monitoring systems that rely on sensors such as door switches and movement detectors. Intelligent inactivity monitoring and fall detection is achieved by considering two distinct characteristics of observed behaviour. Firstly, target motion is analysed to detect characteristic dynamics of falls. Secondly, target inactivity is monitored and compared with a map of acceptable periods of inactivity in different locations within the field of view.
Key words: falls, fall detection, intelligent monitoring, sensor.
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W. Dewing, S. Metz, W. Winchester. Does Home-Care Automation for Elders Change the Caregiver Experience?. Gerontechnology 2002; 2(1): 111. The promise of automated home-care systems includes improved caregiver effectiveness, caregiver satisfaction, and quality of elder care, along with reduced caregiver burden and lessened incidence of caregiver 'burnout'. However, such systems could be linked to less meaningful interactions with elders resulting in increased elder isolation and depression. These are key factors for evaluation during a long-term field test of an automated home-care system we call the Independent LifeStyle Assistant [tm] (I.L.S.A.). I.L.S.A. monitors the daily activities of elders through a variety of sensors to identify functional decline as an indicator of imminent health concerns. Caregivers can use WWW/Internet, telephone, and email technologies to check the status of their elders at any time, while the system can self-generate alerts via telephone and email with important elder status updates. By alerting caregivers to potential health concerns, I.L.S.A. hopes to prolong elder independence at home and improve the caregiver experience. Our initial field tests of I.L.S.A. systems will monitor 10-20 homes of elders living in a community setting and are scheduled for May 2002 through March 2003. During this time we will measure system use, caregiving time, activities, burden, and satisfaction, and perceptions of system effectiveness. Analyses will be based on both quantitative data (e.g., system logs, job satisfaction and burden scales) and qualitative data (e.g., interviews and weekly user logs). These results will help anticipate the potential for monitoring technologies to bring dramatic changes to both caregiver effectiveness and the emotional experience of caregiving.
Key words: automated homecare, caregiver, monitoring technology, independent living.
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D. Bracco. The Gerontechnology for The Autonomy and the Home Care of Elderly People. Gerontechnology 2002; 2(1): 111. A new science, 'Gerontechnology', is discovering new technical and engineering applications to save, increase, and integrate the autonomy and the quality of life of elderly people, particularly those, who are living at home. Thanks to the collaboration between engineers and geriatrics, the home assistances and cares could utilise equipments especially designed for such purpose: from the aids for ADL activity and furniture, to sport units for light fitness; even those of hospital and medical care, from intensive care to rehabilitation, Also the town-planning is looking at new realisations for elderly people: new vehicles admission: special cars, bicycle, motorbikes, taxi bus; new urban park and facilities etc. Up to date researches demonstrated that the elderly people will not depend upon technology but will be able to 'communicate' with it. On the other hand, the elderly who is cared at home reduces infections and comorbidity and takes advantage from the familiar environment. A new professional, the 'Social-Medical Planner' is now available to integrate Architects and Engineers in the projects of nursing homes and rehabilitation centres as well as private home adaptation for disabled people, elderly included: the 'smart house' and other modern examples will be shown. Further our experience, we are realising that the Italian health care as well as other Countries, is able to integrate, in his policy, this concepts especially concerning home care.
Key words: autonomy, home care, quality of life.
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Driving Symposium

K. Ball. Assessing Driving Risk In Older Drivers Presenting to the Maryland Motor Vehicle Administration (MVA). Gerontechnology 2002; 2(1): 112. Prior research has shown that older drivers are at increased risk for crash involvement, not due to age per se but due to sensory, cognitive, and physical impairments that become more prevalent with age. These risk factors have not been detected or evaluated routinely by state driver licensing agencies. This failure of most states to identify at-risk drivers and intervene on their behalf is a growing public safety concern. Recent advances in technology, however, are providing innovative and accessible means of assessing risk in the field. This symposium will present the results of a large field trial of a brief, performance-based risk assessment conducted in the Maryland MVA. We will address the feasibility of administering performance-based tests in a licensing setting; selection of assessment tools, including those relying on recent computer technologies; relationship of the battery to crash involvement; relationship of the battery to other mobility outcomes; and implications for driver assessment and rehabilitation.
Key words: older driver, driver assessment, field research, mobility.
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M. Frankel, V. Wadley. Assessing Driving Risk in the Field: Sample Recruitment and Battery Selection. Gerontechnology 2002; 2(1): 112. A trial program for identifying safety risks among older drivers is under investigation in the Maryland Motor Vehicle Administration. Jointly sponsored by the Maryland MVA, NIA, and NHTSA, the study has recruited 2000+ older driver volunteers approached in the MVA setting, approximately 300 individuals approached in a retirement community, and approximately 50 individuals referred for known risk factors by the Maryland Medical Advisory Board. Participants (n > 2350) did not differ from individuals who declined participation (n > 2150) in age, ethnicity, or gender, nor did they have worse crash records or traffic violation histories. The sample (52% male, 92% Caucasian, mean age 69) provides a robust test of the performance-based measures selected to identify at-risk drivers (e.g., UFOV® subtest 2, Trails A and B, head and neck flexion, foot and leg mobility, the Get Up and Go test, recall measures). Individuals were administered the 20-minute battery, completed short questionnaires about their driving habits and general health, and consented to telephone follow-up, which was conducted within one month of testing and at yearly intervals thereafter. Discussion will include recruitment and follow-up methods that are sensitive to population concerns such as fear of losing driving privileges.
Key words: older driver, age, ethnicity, gender, car crash.
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K. Ball, D. Roenker, G. McGwin. Relationship of Risk Factors to Crash Involvement . Gerontechnology 2002; 2(1): 112-113. Participants' age, gender, crash histories, and physical and cognitive characteristics from their performance-based assessments were entered into a multivariable model of potential risk factors for at-fault motor vehicle collisions (MVC) during the 1-3 year follow-up period. Analyses included 2,112 older driver participants with complete data. Rate ratios and 95% confidence intervals for the

association between risk factors and at-fault MVCs were determined using Poisson regression. Significant full model, unadjusted risk ratios included age, RR = 1.06 (1.02-1.10); > 75th percentile on MVPT, RR = 2.23 (1.21-4.11); >75th percentile, in seconds, on Trails A, RR = 2.33 (1.24-4.36); and > 75th percentile, in milliseconds, on UFOV subtest 2, RR = 3.72 (1.96-7.05). After controlling for shared variance and demographic variables, only UFOV subtest 2 remained a significant and unique indicator of risk. This presentation will include discussion of which measures should be eliminated from inclusion in such a battery due to lack of variability and which measures should prompt further evaluation and intervention. Policy implications for state licensing agencies will be discussed.

Key words: age, gender, physical fitness, cognitive ability, car crash.

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J. Edwards, G. Cissel. Relationship of Risk Factors to Mobility Outcomes. Gerontechnology 2002; 2(1): 113. General mobility measures were obtained at baseline and with two annual follow-up surveys. Factor analysis of 14 mobility items resulted in two factors: driving exposure and driving avoidance. Driving exposure and avoidance composites were constructed and then used as dependent measures in group (pass vs. fail) by time repeated measures ANCOVAs, conducted separately for 3 performance-based risk factors (UFOV, Trails B, MVPT). Gender and tap/walk time were used as covariates in these analyses. Individuals who failed UFOV at baseline drove less, $F(1,476)=12.89$, $p<.001$, and were more likely to avoid certain driving situations, $F(1,551)=6.73$, $p<.01$, than individuals who passed UFOV. However, individuals who passed UFOV tended to increase their avoidance of risky driving situations over time, while those who failed UFOV did not. Individuals who failed Trails B at baseline drove less, $F(1,492)=4.24$, $p<.05$, but were no more likely to avoid certain driving situations, $F(1,569)=1.57$, $p>.10$, than individuals who passed Trails B. Finally, individuals who failed MVPT at baseline drove less, $F(1,494)=5.54$, $p<.01$, and were more likely to avoid certain driving situations, $F(1,572)=6.66$, $p<.01$, than individuals who passed MVPT. These data indicate clear mobility differences between performance-impaired and -unimpaired drivers, with the UFOV measure providing the greatest discrimination between groups. Crash-involved drivers with poorer cognitive function do not limit their driving exposure, while non-crash involved drivers with similar cognitive function do reduce their exposure to risk. Implications for predicting future crash involvement will be discussed.

Key words: risk factor, mobility, gender, walking ability, driving avoidance, impairment.

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V. Wadley, K. Ball, D. Vance. Implications for Driver Assessment and Rehabilitation. Gerontechnology 2002; 2(1): 113-114. In the year 2000, 1 in 8 licensed drivers was age 65 or older. In the year 2025, this ratio will be 1 in 5. Thus, safe mobility for older drivers is a public policy issue that will become increasingly important in the near future. The UAB Roybal Center for Research on Applied Gerontology has consistently focused

on transportation as its theme and on safe mobility for older adults as its primary goal. The specific aims of the Maryland project are: (i) to validly assess the functional capabilities of older drivers, (ii) to identify individuals at risk for MVC and mobility loss, (iii) to make available appropriate driver remediation when possible, and (iv) to provide information and education to the medical community and the public. The performance-based assessment battery evaluated in the Maryland MVA will be discussed relative to these aims. In particular, the utility of the battery as an initial step in referral for secondary evaluation, as well as referral for interventions to restore safe mobility, will be discussed. Implications for education of the medical community and the public will also be addressed.

Key words: driving, driver assessment, mobility, impairment.

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Workplace Issues

I. Coulson, D. McIntosh, Q. Choo, J. Johnson. Using Technology to Design a Hospitable Place where Clients can Live. Gerontechnology 2002; 2(1): 115. Computer technology is essential to manage and handle the vast amount of client information necessary to know the client and design a hospitable environment where life can be lived without fear and where community is fostered. The Good Samaritan Society (GSS) a multi-site continuing care and assisted living service provider is committed to promoting quality of life and providing quality care for its clients. The purpose of this paper is to present the quality practice outcomes and challenges that occurred when the GSS implemented a computerized client documentation system called the 'Client Hospitality Reporting Information and Service System' (CHRISS). The objectives of CHRISS was to create efficiencies in reporting (internal and external), to collect client data with improving the use of assessments (and the time of skilled practitioners) and to improve the service provided to clients by improving the quality service information. Some of the challenges included developing the information gathering assessments in a succinct and reliable manner, development of quality improvement reports, data retrieval, software and rollout issues such as education and on- going revision. The alliance between technologists, gerontologists, and the daily users make it essential to the development of an effective quality client care electronic assessment system that is aimed at promoting positive ageing and improving the life of older people in continuing care and assisted living settings.
Key words: electronic assessment, electronic documentation, hospitality.
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T. Nishino, M. Nagamachi. Job Redesign for Elderly Workers and its Application to Japanese Factories. Gerontechnology 2002; 2(1): 115-116. The ratio of the elderly people to the total population has been rising rapidly in Japan. It is estimated that the ratio will be the highest in the world and this will lead to the shortage of younger workers in the future. Towards the active aging society, Japanese government policy promotes Japanese companies to reemploy the elderly people and to create the working conditions for the elderly to work easily. However, it is true that the elderly worker's ability and work performance go down year-by-year. We have attempted to implement job redesign to increase a chance for the elderly to work, which is an ergonomic 'Kaizen in Japanese' method for redesigning the jobs and working environment to be easier for the elderly workers. In this paper, we report the results of a reemployment project for elderly people that was promoted by Japanese government in Hiroshima, Japan 1995-1998. These companies with many elderly workers are manufacturing high-end furniture. In this project, we selected five pilot factories to promote the reemployment of elderly people. The worker attitudes to their works were surveyed, and their jobs and working environment were consulted and redesigned from viewpoints of ergonomics for the elderly using Job Redesign Consultation System we developed. As a result, a lot of jobs were improved for elderly workers to work easily. For example, the jobs with physically heavy workload such as material handling and transportation were improved for elderly workers to work easily. Finally, this project could contribute in the following points. The companies in the same district as well as the five pilot companies really could understand the importance of the employment for elderly people and learn the job redesign method to improve workplace for elderly worker. Moreover, some companies decided to

extend the retirement age 60 to 65 and the elderly people could work easily and increase productivity. We found that job redesign approach for elderly workers was more effective for the health and satisfaction of elderly workers as well as for production productivity.
Key words: job redesign, older worker, work improvement.
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A.M. Guillemard, G. Cornet. Ageing and Work: Changes on the European continent. Gerontechnology 2002; 2(1): 116-117. The Ageing society global challenge implies a global change for an inclusive and well ageing society. Ageings negative image must change and considered as a resource, not a burden, firstly in the workplace. So the symposium will consider the following topics: (i) Changes in the European continental model of social welfare with regard to early retirement policies and practices : the comparison between the social policy in The Netherlands and Finland to increase the rate of employment of the older work force, and transferable learning to the French case will illustrate this evolution (e.g. Pr. Anne Marie Guillemard and Gerard Cornet report to the French government council COR (Conseil pour l'Orientation des retraites, September 2001) on this topic. The European goal for social policy and employment is to increase the average employment rate for the 55/64 up to 50% (France rate =34% wide gap) but the issue here is how to delay the effective average age retirement (58,5) if there is no real supply in the marketplace, prevailing age discrimination practices for older workers, and easy pathways to early retirement or disability benefits and long lasting unemployment benefits? A better coordination between social policy incentives to keep in the work place and desincentives for laying off and early exit and practices is needed but not sufficient . Too generous social benefits and specific measures to combat massive unemployment, and the wrong idea that early exit will help for giving jobs to the young, have played against employment of older workers and created a cultural agreement for early retirement. Therefore the image and culture of early retirement and the negative image of older workers are issues to be addressed by information campaigns, vocational training at different levels, but that will take time and need crystal clear political will and strong cooperation with and between the social partners (ii) Ageing and adaptation to new technology : from a negative image and restraints to an higher productivity at work, personal achievement and better ageing :the starting point will be the overall negative point of view and manager's prejudices with regard to older workers' image, considering the adaptation to new technology and change issues, lower productivity, higher wages cost, time pressure. It is more simple for managers to get rid of older workers than to address the real obstacles (lack in ergonomics, motivation, benefit perception, inadapted training,) and take advantage of their potential of usable experience-tacit or explicit- to promote adaptability and performance. Research findings demonstrate that there is no relationship between age, mental capacities, and performance at work , and that on the contrary, the experience of older workers may produce higher performance in achieving complex tasks provided that right time and freedom of answer would comply with. A cooperative approach and exchange of experience between generations, the younger ones bringing in their skills in new technology , the older their practical experience of business and knowledge of the company and its customers will result in better overall productivity and performance and return on new technology investment. Life long life learning and training considered as a must in principle, should now be put in practice all along the working life course, and reviewed as

short term profitable investment in a flexible organisation matching with uncertain and hazardous business environment. Even if the situation may be different according to the countries and the average use of ICT, the generation gap still exist , will last, and the issue must be addressed by inclusive design and training. The mental ability to learn and performance capacity, in most cases straining and painful work excepted, is individual and not related with age, in spite of functional impairments increase. (As unusual example case, I could quote a university research on psychological self-esteem benefits worked out of learning computer use for moderate Alzheimer's' to illustrate the importance of adapted training and customized monitoring). (iii) Age discrimination at work: In spite of European Community and national laws' anti-discrimination provisions, age discrimination practices are current and implicit in recruiting and human resources management policies, as if the older workers would be only a burden and not a resource. In The European ageing nations, awareness of welfare policies constraints and growth constraints lead to a change in decision makers, but practices and attitudes still remain in a 'Young is beautiful' minded society. Are age anti-discrimination provisions and campaigns adapted? To what extent diversity management model in a more diverse world may offer a better framework to an inclusive ageing society ? European stakes and projects of the Equal EC program, give an opportunity to compare with the US situation. As for example ,the European funded project IDEAL(Equal programme) setting up a transnational cooperation between three projects (Vectorat from France, Kovo from Finland, Tred from Ireland) will address this issue, aiming at building up comprehensive age management tools either for human resources managers, vocational trainers, unions workers' shop stewards, and workers themselves for a new personal management of their second part of their working life course. At large, the stakes are a new and better management of human capital in a technology and services oriented open economy: an ageing society cannot afford the huge waste of human capital resulting in late way in and early exit of the workplace, if maintaining an equitable level of welfare for all is wanted in a competitive economy. So Welfare with work is becoming the new paradigm for the continental socio-economic models.

Key words: aging, work, social welfare, older worker, ergonomics, legislature.

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S.N. Williams, J. Chestnut, L. Crumpton. Characterization of Work Capabilities: A Method for Minimizing the Risk of Ergonomic Injuries Among Older Workers. Gerontechnology 2002; 2(1): 117-118. The composition of our nation's work force is changing, resulting in both a larger number and percentage of workers over the age of 55 (Ellis and Goldberg, 1995). In fact, U.S. Bureau of Labor Statistics indicates nearly 16 million Americans age 55 and older are working or seeking work. In addition, more than a million workers between the ages of 70 and 74 are currently employed. As workers age they typically experience physiological and psychological changes which must be estimated to minimize the mismatch between their capabilities and job demands as well as to prevent work related injuries such as over exertion injuries. Early identification of declines in work ability and implementation of ergonomic interventions are key to sustaining older and more experienced workers in the workplace (Williams et al., 1996). If preventive measures are not taken, older employees are likely to experience a decline in work capacities (Ilmarinen 1994). Therefore, reliable and valid measures of one's ability to perform work activities are essential for preventing work-related injuries. Hence, the focus of this paper is the identification of tools and techniques that

are available for estimating workers' ability to perform daily work activities. In addition, the adequacy of existing tools and techniques for use in industry will also be discussed.
Key words: aging, older worker, work capability, overexertion injury, assessment.
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N. Mazor, A. Fink, S. Rosenfeld. Improving the Quality of Your Life - A CD ROM developed for the dissemination of Information and Services to the public. Gerontechnology 2002; 2(1): 118. Yad Sarah, a nation-wide voluntary non-profit organization providing a wide network of homecare and community services in Israel, has produced a pilot CD ROM entitled 'Improving the Quality of Your Life' (IQYL) for its assistive technology centers. The two main assistive technology centers, better known as the Resource and Exhibition Centers, display hands-on equipment that aids in activities of daily living, a large percentage of which is available via the Yad Sarah nationwide fee lending service. In addition each center has an extensive resource center of books, catalogs, videos and data bases that aid in personal adaptation and decision making. Among the visitors to the centers are: end users with varied functional levels: family members; caregivers; para-professionals; community workers; students; designers; manufacturers; distributors. Professional consultation, by an occupational therapist, physical therapist, rehabilitation counselor, nurse, or a trained volunteer is available for any visitor with an illness, permanent disability, or a desire to incorporate the 'wellness model' and home safety into one's lifestyle. The IQYL was initially geared for the community looking for solutions and good ideas for their older family members . The level of computer-savy adults has risen dramatically in Israel, and the center decided to tap into this multifaceted world of information dissemination. The IQYL enables the viewer to actively learn about assistive technology and services, encouraging them to utilize the expertise available, in order to improve the quality of their lives (www.yadsarah.org.il).
Key words: assistive technology, CD ROM, ADL living, adaptation, information services.
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Smart Home Design

S. Brownsell. How 'smart' should a smart house be?. Gerontechnology 2002; 2(1): 119. Assistive technology (AT) in the home covers a wide spectrum from advanced electronic devices to the more familiar devices such as hand rails. Yet it is possible to 'over provide' such technologies to those people who may need some support to aid their living but do not require the full range of ATs available. This paper focus on such people as they represent a range of people who may be enabled to live safely, securely, and independently in their own homes for longer. In particular the paper discusses: (i) The reasons why: The driving factors behind why we need a 'basic' level of smart home technology for older people living independently. (ii) User and service provider views: Reporting on focus groups and individual interviews with 170 AT users (age range 56-91) regarding what ATs they want in their homes. (iii) Suggests future generations of smart home technology: Based on the views of users, service providers and a review of the technology, describes the technologies and systems required both now and in the future. (iv) Indicates the potential implications: Both in terms of service delivery and the human resource implications, but also cost-effectiveness. The cost-effectiveness study is based on a health economic analysis. (v) The paper also describes the Barnsley smart homes for disabled and older people, and reports on findings of a current evaluation of home based fall technology equipment.
Key words: telecare, telemonitoring, smart home, user view, system design.
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T. Smith-Jackson, J. Kwahk, R. Williges. Senior Healthwatch: Designing a Health Monitoring and Information Interface for a Smart House. Gerontechnology 2002; 2(1):119. The proposed paper describes the process used by the design team to develop Senior Healthwatch, an adaptive system designed to monitor and support healthy daily living for seniors within a Smart House system. The challenge was to design an interface that could deliver meaningful and informative content, was easy to understand, and adaptable to different user groups as well as tailored to individual needs of a user. This research was conducted with participation by seniors throughout the process, including the use of an advisory board of seniors. In the first project phase, a conceptual model was developed through archival research, information from seniors, and review and feedback from the design team. In the second phase of the project, specific requirements were gathered using focus groups and online assessment activities involving seniors and healthcare providers. For example, sensor placement within the Smart House, information items to be displayed, and activities to be monitored were identified based on the requirements from participants who responded to a scenario administered in a focus group. In the third phase, the sensor data obtained from the Smart House was transformed into information items requested by the users using Neural Network modeling. In the fourth phase, a prototype interface was developed to be evaluated by seniors. Interface design requirements were gained from the aforementioned activities and online evaluations by seniors. Details of the process and an overview of the results will be discussed.
Key words: smart home, neural network modeling, user-orientation, computer system.
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D.M. Kutzik. From Domotics to Informatics: Web based Behavioral Monitoring of Functional Health and Daily Activities. Gerontechnology 2002; 2(1):120. This presentation reports on research into the use of data collected by a passive system that monitors task-oriented behavior of at-risk individuals in the home. Although the system uses many components also present in domotic applications, our system moves beyond environmental and security controls to the use of principles derived from the field of informatics to provide vital information to the individual being monitored and both informal and formal caregivers. The VirtuCare System uses a configuration of inexpensive non-obtrusive electronic sensors, microprocessors and wireless technology to record, track, store, and analyze key functional behavior, and then post the information to a pin secure internet website. Since VirtuCare records the individual's movement and interaction with objects in the environment, there is no need for cameras nor for the individual to wear any mechanism or push any buttons. The data collected are automatically translated into information and delivered via the web to one or more sites. This information can be presented in a variety of formats that can provide: (i) real time indicators of specific behavior, e.g., whether an individual has taken her medication this particular morning; (ii) trend analysis of one or more task oriented behaviors, e.g., overnight toileting; (iii) an overall picture of changes in an individual's functional health. Analysis of responses by individuals monitored, family caregivers, case managers, physicians, and other health care professions to these various formats indicates that the VirtuCare system complements existing care plans and increases the sense of security and peace of mind of all participants.
Key words: caregiving, informatics, domotics, functional health, monitoring.
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L.G.H. Koren, C.E.E. Pernot, M.C.L. Snijders, J.E.M.H. van Bronswijk. Supply and Demand of Indoor Air Qualities in Dwellings. Gerontechnology 2002; 2(1):120. Indoor air quality (IAQ) influences the health of humans, the young and the old being generally more susceptible. In this study we examined how supply and demand of indoor air quality in dwellings are matched. Three population groups were selected: chronic lung sufferers, elderly (aged over 60 years) and young (aged under 20 years), and healthy adults. Complaint percentages in different air qualities derived from literature, and actual IAQ levels in dwellings were compared. IAQ criteria were derived from literature for the different population groups. The indoor air quality in 53 Dutch dwellings was measured during a week in summer or winter and compared with the expected needs to evaluate the implications for building construction and installations. CO2 concentration, humidity class, ventilation rate, and fine particle ratio (indoor versus outdoor) were used as quality parameters. In none of the dwellings an acceptable IAQ for the most susceptible group was present, while only 2 dwellings met the standards for the group of young and elderly persons. This indicates that for up to 50% of the population IAQ at home in the Netherlands is less than optimum. Apparently, ventilation is inadequate. Within an ageing population and an increasing incidence of airways-related diseases, ventilation facilities should be directed towards the actual needs of the persons concerned. Managing IAQ in dwellings through adaptive sensor-controlled ventilation systems may be a way to avoid health risks from indoor air for the elderly and other susceptible populations.
Key words: health, IAQ, ventilation, lung disease, asthma, COPD.
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Telecare

M. Frossard, G. Nathalie. The demand for telecare for the elderly people : determinants and willingness to pay. Gerontechnology 2002; 2(1): 121. A demonstration project of following up elderly persons at home has been developed recently. Persons are in communication from their home to a daycare centre via a video device consisting of a computer and a web camera with very user-friendly access. They can call the centre or can be called by it. It involves the daycare centre belonging to the university hospital, France Teleccom, and our Research Unit (LI2G). The objective of this paper is to present some results of two surveys that our Research Unit conducted in 2000-2001 to study the effectiveness of this technology, the factors of demand, and the willingness of patients to pay for it. One was conducted among users of the device, the other in a population of 55 and over in the Grenoble Area (urban and rural). Results show that previous use of technology and experience of lack of mobility due to a previous illness are the most important factors for potential demand. Other factors (income, age, gender) are significant in urban areas but not in rural areas. Time or distance to the medical facilities are surprisingly not a significant factor. Willingness to pay for this service is up to 30 euro per month in urban areas, but half of this in rural areas.
Key words: health, telemedicine, economic evaluation, elderly.
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* Profesor Michel Fossard has passed away recently

A. Johnson. Interactive Telehealth: Creative Geriatric Continuing Education for Rural Mental Health Care Providers. Gerontechnology 2002; 2(1):121. Distance-learning technologies are needed to supplement traditional continuing education settings in this time of downsizing, expanding job responsibilities, limited training budgets, and limited time for educational experiences. This presentation will describe continuing education courses conducted via interactive teleconference technology for rural mental health care providers; discuss strengths and challenges of utilizing interactive distance learning techniques; and identify recommendations for replication of the program. A 40-hour CE program for community mental health, Mental Retardation/Developmental Disabilities and aging professionals was funded through a five year Geriatric Education Center grant from the US Department of Health and Human Services, Bureau for Health Professions, to the Ohio Valley Appalachia Regional Geriatric Education Center at the University of Kentucky. Collaborative support was provided by the USDHHS funded University of Kentucky Telecare Network Program and privately funded community mental health centers across Kentucky. Real life, real time challenges of the new interactive video-teleconferencing technology will be described, with a special focus on lessons learned. Evaluations from the series indicated that workers greatly valued the ability to receive excellent quality geriatric education without investing the time and money to travel to distant sites. Problems with the technology were identified as the primary disadvantage of this educational medium. Issues relating to timelines, program agendas, presenters, and use of the technology will be included. Suggestions for replicating a continuing education series will be discussed, and participants will be asked to share their experiences with similar distance learning technologies.
Key words: distance-learning; interactive video, mental health care, mental retardation, rural.
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M. Mickus. Facilitating Family Support for Institutionalized Elders via Videophones. Gerontechnology 2002; 2(1): 122. The role of social support in the health of older persons is well documented, particularly for isolated nursing home residents. The purpose of this study was to test the feasibility of using low-cost videophones to enhance communication between nursing home residents and their families. Ten pairs of residents and family members received videophones for a six-month period. Distance between pairs ranged from several miles to intercontinental. One of the key objectives was to measure the potential for use independent of assistance by nursing home staff. Four of the ten pairs completed the study with only minimal assistance. Only one pair discontinued participation due to a severe physical limitation. The remaining subjects did not complete the study because of inability to tolerate technical difficulties with the equipment, even after assistance by the research team. Frequency of communication among family members did not increase significantly over the study period, with only one pair reporting greater contact resulting from availability of the videophone. Sixty percent of subjects, however, cited videophones as effective in improving the quality of contact with family members. Findings from this pilot study support the need to further explore videophone use among specific nursing home populations with added consideration of physical capability and tolerance for technical difficulties.
Key words: support, videophone, nursing home, quality of life.
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D. Morrow, M. Weiner, M. Deer, J. Young, S. Dunn, P. McGuire, M. Murray. Design and Distribution of Patient-Centered Medication. Gerontechnology 2002; 2(1): 122. Patients need expanded instructions that augment medication labels with patient-specific information about directions, side-effects, and interactions (e.g., DHHS 1996). Such instructions would especially help older adults, who often take multiple medications. Pharmacies face two challenges to providing expanded instructions: (i) Instructions should be easily understood and used by patients of varying abilities and needs; (ii) they should be easy to routinely distribute. Both challenges are addressed by our project, a pharmacist-based intervention to improve adherence among older adults with chronic heart failure (CHF). (i). Designing understandable instructions. We developed patient-centered CHF instructions (e.g., simple language, icons). While similar instructions improve comprehension by well-educated older adults, we investigate whether they also improve comprehension and adherence in a diverse sample of patients with CHF. A preliminary study (N=31, 4-17 years education, 61% African-American) found that 65% preferred these instructions to standard pharmacy instructions. Those preferring patient-centered instructions focused on ease of comprehension; those preferring standard instructions focused on amount of information. (ii). Distributing instructions. Pharmacists distribute instructions to patients in the adherence study using a workstation that is part of a computerized medical record system. This system supports pharmacist collaboration with patients and provision of specific instructions based on this collaboration. It prompts the pharmacist to ask about medications, diet, and other self-care topics. It includes graphical timelines depicting patients' desired schedules for each medication and software that integrates timelines with the instructions and generates a calendar summarizing the patient's daily schedule. It also enables pharmacists to track medication changes and provide follow-up education.
Key words: medication adherence, medication instructions, health, communication.
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Gerontechnology Posters

P. Holley, T. Jastrembski, N. Charness. Predicting Age Effects for Direct and Indirect Input Devices in a Mixed Data Entry and Pointing Task. Gerontechnology 2002; 2(1): 123. This experiment looked at direct and indirect positioning devices in a mixed pointing and data entry task for effects of preferred/non-preferred hands in experienced mouse users across young, middle-aged, and older adults. We used linear regression to look for predictors of age differences in each experimental condition (preferred hand with mouse, preferred hand with light pen, non-preferred hand with mouse, non-preferred hand with light pen) as well as the magnitude of those differences. Significant predictor variables included age (beta = 0.414 PM; 0.345 PL; 0.417 NM; and 0.365 NL, respectively), perceptual speed (WAIS-III Digit Symbol) (beta = -0.287, -0.308, -0.254, -0.425, respectively), and reasoning ability (ETS Inference) (beta = -0.207, -0.235, -0.246, -0.197, respectively). A per year increase in age predicted an increase in reaction time of 48 msec for the mouse over both preferred and non-preferred hands, and an increase of 46 msec for the light pen. Perceptual speed predicted a decrease in RT of 48 msec for each additional point gained on the Digit Symbol Test for the mouse conditions, but 69 msec for the light pen conditions. Reasoning ability predicted a decrease in RT of 125 msec for the mouse and 133 msec for the light pen for each additional point gained on the inference test. Prior research showed the light pen reduced the aging effect in a pure pointing task indicating a clear advantage for the light pen even for experienced mouse users. Interestingly, in this mixed data entry task the mouse was more efficient for the first trial block after which there was no advantage for either device.

Key words: aging, older adults, input device, computer, human factors.

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*T. Jastrembski, P. Holley, N. Charness. Predicting Age Effects for Direct and Indirect Input Devices in a Pure Pointing Task. Gerontechnology 2002; 2(1): 123.*This experiment looked at direct and indirect positioning devices in a pure pointing menu acquisition task for effects of preferred/non-preferred hands in experienced mouse users across young, middle-aged, and older adults. Previous analyses indicated the light pen minimized age and hand differences. We used linear regression to look at the effects mitigating age differences for each experimental condition (preferred hand with mouse, preferred hand with light pen, non-preferred hand with mouse, non-preferred hand with light pen) as well as the magnitude of those differences. Significant predictor variables included age (beta = 0.219 PM; 0.225 PL; 0.227 NM; and 0.206 NL, respectively), perceptual speed (WAIS-III Digit Symbol) (beta = -0.217, -0.196, -0.235, -0.430, respectively), and reasoning ability (ETS Inference) (beta = -0.301, -0.410, -0.200, -0.176, respectively). A per year increase in age predicted an increase in reaction time of 35 msec for the mouse over both preferred and non-preferred hands, but an increase of 18 msec for the light pen. Perceptual speed predicted a decrease in RT of 43 msec for each additional point gained on the Digit Symbol Test for the mouse conditions, but only 32 msec for the light pen conditions. Reasoning ability predicted a decrease in RT of 153 msec for the mouse but only 92 msec for the light pen. We will discuss implications for input device use based on the results.

Key words: aging, older adults, input device.

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A. Carmichael. VISTA: Virtual Interface for a Set-Top box Agent. Gerontechnology 2002; 2(1): 124. An overview will be presented of a new multi-disciplinary project examining the human factors issues involved in the provision of a 'virtual assistant' as the interface between digital television viewers and the content and functions of an electronic programme guide (EPG). While it is anticipated that the resulting interface will make accessing EPG information easier for all users, the main target audience will be older viewers who currently experience disproportionately greater difficulty using currently popular GUI style EPGs especially with 'standard' TV/VCR remote control handsets as the input device[1]. Despite the great potential for improved usability of EPGs, this type of 'conversational' interface is unlikely to prove the straightforward technical panacea it has occasionally been anticipated to be[2] but rather it will raise a host of new human factors issues, particularly in relation to the needs and requirements of older viewers. Examples of this include, whether the (limited) animated mouth movements of the virtual assistant will help or hinder the intelligibility of the synthetic speech due to the relative reliance of many older listeners on 'speech reading'. Also the extent to which head movement and facial expression may (or may not) help users stay 'on-script'.
Key words: older users, virtual assistant, speech recognition, synthetic speech, user interface.
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References: (i) Carmichael AR. Style Guide for the design of interactive television services for elderly viewers. Winchester: Independent Television Commission Standards and Technology, Kings Worthy Court; 1999; pp 104 2 Morris JM. User interface design for older adults. Interacting-with-Computers 1994; 6(4):373-393.

A . Libin, J. Cohen-Mansfield. Palm Pilot use for behavioral observations. Gerontechnology 2002; 2(1): 124. With recent advances in technology, it is now possible to record direct observations of behavior using hand-held computers that contain specialized observational software. We have found that using the Palm Pilot hand-held computer m 100 has greatly facilitated our ability to capture environmental influences, occurrences of individual behaviors, and the interactions of these in our study of elderly nursing home residents suffering from dementia. Adequate inter-rater reliability was found with the Palm Pilot. Advantages of using the Palm Pilot – in comparison to alternatives such as paper-and-pencil, portable laptop computers (Burgio et al. 1994), and Observer software installed on a Psion hand-held computer (Cohen-Mansfield et al. 1997) – are: highly interactive software; ease of using the touch pad; storage of multiple records; automatic assignment of a unique ID number per record, date, and time (which is useful for analysis); capability to transfer data to a database on a hard drive (via hot sync feature); commercial availability; and, physical attributes (lightweight and pocket-sized). On the downside, there is the possibility of losing data during transfer from Palm Pilot to a desktop PC. A summary of our experiences with the Palm Pilot in the nursing home will be presented. [Funded by NIA grant 1 R21 MH59617-01].
Key words: behavioral observation, palm pilot, dementia, nursing home.
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P. Hancock, M. Lesch, L. Simmons, J. Smither, M. Mouloua. In-Vehicle phone use erodes the margin of driving safety especially for older drivers. Gerontechnology 2002; 2(1): 124-125. There is significant contemporary concern for the safety effects of mobile

phone use during driving. However, it is as yet unresolved as to whether and to what degree, such usage increases collision frequency. We have argued that such uncertainty arises from the fundamental nature of driving which oscillates between a totally attention demanding task to an automated, over-learned response. To evaluate the safety impact of phone use while driving therefore, it is necessary to examine drivers' reactions during critical driving maneuvers when their attention is fully engaged. This report details such a critical evaluation. On a controlled test track facility we evaluated the performance of forty-two licensed drivers who were evenly split between male and female participants and between an older and a younger group. These drivers were required to respond to an in-vehicle phone at the same time that they were faced with making a crucial stopping decision. Of primary importance, we found a critical 15% increase in red light violations in the presence of the phone distraction task. This compliance rate to the red-light activation was modified by driver age such that older individuals were disproportionately disadvantaged by the presence of the distraction. In addition to compliance, which represents drivers' abilities to recognize the presence of the red light, we also noted a slowing of reaction in cases where drivers did recognize the critical red light activation. For example, we found a 36.5% increase in the average time to activate braking and even though drivers tried to compensate for their late response by an increased intensity of braking, we still found a 47.6% decrease in safety margin as represented by stopping distance in front of the light. These combined results indicate that drivers miss more critical external signals in the presence of phone distraction but also show that even when they are aware of critical external demands for stopping, they are much more inefficient in response. The apparent simplicity of driving hides a fundamental complexity that means that it is not possible to specify a simplistic relationship between these distraction effects and outcome crash patterns. However, we can conclude that in-vehicle phone use erodes performance safety margin to a significant and disturbing degree. How such a safety margin can be restored by improved in-vehicle device design is a crucial objective of the transportation telematics enterprise.
Key words: in-vehicle phone use, older driver.
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L. Pearson. Older, Novice, Self-Directed Computer Learners. Gerontechnology 2002; 2(1): 125-126. Findings are reported from a study of older, novice, self-directed computer learners. This study examined the computer learning experience of older, novice learners who acquired computing skills informally and mainly on their own. Specific findings of the study include: the development and change of computing knowledge over the course of learning; the independent carrying out of the computer learning endeavor; the use of people and materials as learning resources; perceptions of the experience of independently carrying out a new and mentally challenging learning activity. The findings of the study are revealing about the learning experience of older computer users, those aged 65 years and more, who for various reasons acquire computing skills without the aid of teachers and support associated with formally organized courses. Specific concerns include how computing knowledge changes over the course of learning as revealed by the types of computing activities engaged in; how the older learners organize, structure, and make decisions about their learning; and how and where support for the learning is acquired. Also of concern are the perceptions of these older computer learners of independently carrying out a new and mentally challenging learning endeavor. Data was gathered using a naturalistic approach that included inter-

views and self-report instruments.
Key words: computer learning, computer novices, life-long learning, naturalistic research.
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E. Marziali. Virtual Support Groups for Elderly Community-Based Caregivers and Video-Taped Life Histories for Memory Stimulation. Gerontechnology 2002; 2(1): 126. Results of two pilot studies of the use of internet-based interactive communication and video-based technologies with elderly participants will be presented. The projects include: a) analysis of elder users' feedback on the design of a designated web site that hosts interactive links (text-based and videocam) to support virtual group counseling interactions, and b)analysis of dementia patients' responses to viewing video-taped stories of their own life histories. The unique features of the technologies used will be illustrated, as for example, color images of design features of web pages that were modified in specific ways to respond to the learning needs of elderly users. As well coding strategies developed to record the video-taped response of the dementia patient to viewing specific segments of the video-taped life history will be presented. We will also report our findings in terms of criteria to be used when designing web sites for use by older adults. Similarly, the steps for filming, editing, and coding patient responses to the video-taped life histories will be presented.
Key words: community-based health programs, video-taped life histories, memory stimulation.
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A. Johnson, W. Wong. University-based computer instruction for older students. Gerontechnology 2002; 2(1): 126. The challenges associated with teaching computers to older adults are presented, along with survey results from older students taking computer courses. Special computer classes for older adults have been administered in the Donovan Scholars Program at the University of Kentucky since 1996. Computer courses were designed especially for students aged 60 and older. The design considered curriculum content, instructional techniques, and selection of instructors, along with students' background knowledge of information technology, experience with computers, learning expectations, and visual and motor capabilities. Students were surveyed in 1997 and 2001, with questions on computer usage, and opinions on class content and satisfaction. Results relate student demographics and responses on type and frequency of computer usage. Differences and trends are displayed and interpreted. Results of these surveys are also compared to data collected on a statewide sampling of use of technology in Kentucky. Over 1000 older adults have been trained in six years of classes in the Donovan Program. To enable the older person to successfully learn computer skills, we believe that we must have separate university-based courses that address the special needs of this population. This poster session will enhance understanding of the needs of older learners while enabling educators and program planners to discuss strategies and the development of computer courses at their universities or program sites.
Key words: education, computer skill, lifelong learning, older persons.
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S. Handler, N. Resnick, R. Schultz, C. Friedman. Use and attitudes toward interactive computer services in community dwelling older adults. Gerontechnology 2002; 2(1): 126-127. Interactive computer services such as E-mail have demonstrated psychosocial benefits in some populations. However, little is known about the use of these services

by community dwelling older adults (CDOA), yet these individuals may uniquely benefit from such services because of their limited social networks and high risk for loneliness. The objective of this study is to determine how a population of CDOA (aged 70 and older) who express an interest in E-mail differ from those without such interest. To date, 30 participants (mean age 79.3, 80% female) have been interviewed, of whom 43% had used a computer and 23% had used E-mail on at least one occasion. 33% were married, 73% lived alone, 30% had an ADL deficit, and 40% had an IADL deficit. Mean MMSE score was 27.3±2.7 and mean CES-D was 8.0±6.6. Loneliness, measured using the UCLA Loneliness Scale, was greater in this cohort than has been documented in previous studies of CDOA (M= 37.3 vs. 31.5). Additionally, the mean Lubben Social Network Scale score (26.7±10.2) suggests that this group has limited social networks. These preliminary results suggest that CDOA may be an important target population on whom to test the effects of E-mail services.
Key words: electronic mail, computers, older adults.
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R. Roush, T. Teasdale, M. Gill. A Technology to Determine Accuracy of Health Information Accessed from Web Sites. Gerontechnology 2002; 2(1): 127. From the launch of the WWW on Christmas Day, 1990, (Berners-Lee 1999) to April 2002, there were 38,118,962 Web sites (http://www.zakon.org/robert/internet/timeline/). The Pew Internet and American Life Project found 52 million U.S. adults using the Web to obtain health information, with 70% finding and using information through unguided searches on 17,000 health Web sites (Fox S et al. 2001). The Pew study also found that wired seniors log on daily (69%) at higher rates than do average Internet users (56%). All of this is good if the information found and used is accurate. Despite published criteria to evaluate health-related Web sites (Kim P et al. 1999), too few Web pages reveal the four metadata elements used as proxies for accuracy: authorship, attribution, disclosure, and currency (Silberg W, 1997). One information technology research project revealed the average number of these four elements being as low as 1.23 per Web page (Shon J, Musen M, 1999). The presenters will have laptops available so attendees can see how the Huffington Center on Aging utilizes the metadata technology to gauge the accuracy of health information on Web sites linked to their Distance Learning Menu at http://www.hcoa.org, whose mean number of accuracy proxies exceed 3.0/page. We will also show how students and fellows are taught to 'peer review' health sites using the Huffington system as the basis for writing information prescriptions for their older patients and the patients' caregivers.
Key words: World Wide Web, older adults, accuracy, health information, metadata.
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E.Y. Haveri, F. Vela, V. Koja. Third Age in Albania. Gerontechnology 2002; 2(1): 127-128. As of 1 April 2001 the population of Albania is 3,087,157 persons of whom 1,539,080 are males and 1,547,179 are females. Urban population is 42% while 58% is rural. The number of males and females is almost equal for the country as a whole. There are 995 men for 1,000 women - migration being the obvious principal factor for such disproportion. Third (60-80 years old) and 4th Age (80-100 years and beyond) form 10% of total population, of which a very small percentage is 100 years and older. I will present the analysis of the 3rd Age group as follow: (i) First the selection and

determining of the death cause is done according to the criterion based on the notion of the initial cause, i.e. the disease or trauma determining the situation that led to the death. (ii) Second is the information acquired through the 'medical certificate' in the death form. The data in this part of the form are filled in by the doctor and the official statistics source of the disease serving as a death cause. The causes of the death for 1999 are compiled based on the processing of the section 'medical certificate' of the death form. (iii) In total are 11 tables that are involve in this study. On the bases of the tables it may be concluded that in this age-group (60-80 years) death has been the result of suffering from a disease complex. In this aspect it is necessary to care for them, both by the family and a physician. Females live longer than males in old age, their deaths are 1,331 cases, comparing with 772 cases of males, in total 2,103 cases along the year 1999. (iv) In rural zones the longevity is higher than in urban zone, and besides these 1,240 cases of death in rural are against 863 cases in urban zones. (v) Thus the food, pure air, environmental conditions have influenced longevity. Increased care of families for this age group is evident. In numbers: 2,059 elderly people that die at home against a total number of death of 2,103. (vi) Going more deeply in the analysis of disease situation in this group, it is clear that elderly have commonly circulatory problems with 1,214 cases; 541 cases are not defined, and 160 cases concern pulmonary disease. The valuation of this fact is for two genders (male and female) although the report is 2:1 in favour of females. (vii) This age group has a small number of death cases from trauma and infection or parasitic disease in comparison with other age-groups. This is because contacts with the environment are restricted, mobility is limited, and they are better cared for, especially by their relatives. (viii) Main task of the state is to increase care for them. NGO's should have the same aim, especially those that are working with and for older people. AAGG (ALBANIAN ASSOCIATION GERONTOLOGY-GERIATRICS) has to be in front of all, because possibilities exist. (ix) We, as Researcher, Project manager and member of Direction Council of AAGG, shall try to increase the future efficiency of the work by continuing the 'Daily Center of Older People' Geriatric Clinic from the late Dr. Ymer Haveri MD.

Key words: third age, mortality, morbidity, age, gender, longevity.

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E. Y. Haveri, A. Buçka. Fourth Age and Their Causes of Deaths. Gerontechnology 2002; 2(1): 128-129. Mortality and morbidity of the 4th age (81-100 years old) will be treated the same as those of the 3rd age, as follows. (i) First the selection and determining of the death is done according to the criterion based on the notion of the initial cause, i.e. the disease or trauma determining the situation that led to the death. (ii) Second is the information acquired through the 'medical certificate' in the death form. The data in this part of the form, are filled in by the doctor and the official statistics source of the disease serving as a death cause. The causes of the death for 1999 have been compiled based on the processing of the section 'medical certificate' of the death form. (iii) In total are 11 tables that are involve in this study. On the bases of the tables it may be concluded that in this age-group death has been the result of suffering from a disease complex. In this aspect it is necessary to care for them, both by the family and a physician. Females live longer than males in old age, their deaths are 1,331 cases, comparing with 772 cases of males, in total 2,103 cases along the year 1999. (iv) In rural zones the longevity is higher than in urban zone, and besides these 1,240 cases of death in rural are against 863 cases in urban zones. (v) Thus the food, pure air, environmental condi-

tions have influenced longevity. Increased care of families for this age group is evident. In numbers: 2,059 elderly people that die at home against a total number of deaths of 2,103. (vi) Going more deeply in the analysis of disease situation in this group, it is clear that elderly have commonly circulatory problems with 1,214 cases; 541 cases are not defined, and 160 cases concern pulmonary disease. The valuation of this fact is for both genders (male and female) although the report is 2:1 in favour of females. (vii) This group age has a small number of death cases from trauma and infection or parasitic disease in comparison with other age-groups. This is because contacts with the environment are restricted, mobility is limited, and they are better cared for, especially by their relatives. (viii) Main task of the state is to increase care for them. NGO's should have the same aim, especially those that are working with and for older people. AAGG (ALBANIAN ASSOCIATION GERONTOLOGY-GERIATRICS) has to be in front of all, because possibilities exist. (ix) We, as Researcher, Project manager and member of Direction Council of AAGG, shall try to increase the future efficiency of the work by continuing the 'Daily Center of Older People' Geriatric Clinic from the late Dr. Ymer Haveri MD.

Key words: fourth age, mortality, morbidity, age, gender, longevity.

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K. Pillemer, R. Meador. CNA CareLink: Web-based Training for CNAs. Gerontechnology 2002; 2(1): 129. Training and professional development for the 1.5 million Certified Nursing Assistants in long-term care is critically important. They make up the large majority (two thirds) of the long-term care work force and despite their important role, have been found to experience high levels of stress and burnout, as well as job dissatisfaction. This results in high turnover of nursing home frontline workers, with annual CNA turnover estimated at 97%. This turnover rate can be reduced through innovative professional development. Frontline Publishing, Inc. has designed, implemented, and evaluated a prototype training product, CNA CareLink, that provides web-based in-service training to CNAs in the form of self-paced courses that combine streamed audio/video web presentations, discussion boards, and short assessment sessions integrated into a comprehensive learning system. The results of the evaluation of this prototype, featuring a module on Feeding and Nutrition, will be used to develop a library of CNA training modules on interpersonal relations, communication skills, self-care strategies, and gerontological information. The prototype was evaluated using a multi-method design, with an extensive data collection effort involving: (i) pretest and posttest comparisons of subjects' learning retention of feeding practices, attitudes, and perceived self-efficacy regarding feeding and nutritional issues; (ii) separate focus groups with CNA participants and administrative staff (Director of Nursing, administrator, Staff Development Coordinator); and (iii) unit-level data collection.

Key words: distance learning, staff development, long term care, nursing assistant.

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F. Horiuchi, Y. Higashi, T. Fujimoto, T. Tamura. Effects of the power-assisted walk training device in the hemiplegic patient. Gerontechnology 2002; 2(1): 129-130. The power-assisted walk-training device has been developed for gait training. The device has three special features; one is that the subject can be held by arm for preventing fall, second is two separate walking belts that can be controlled separately. Last one is a virtual reality device that provides a picture such as a landscape. A virtual environment in the landscape with computer graphic character was applied

to encourage training for patient. We have evaluated this device with the effectiveness of this training device and virtual reality tool. The training effectiveness was tested via the balance reaction by stabilometer or accelerometer after training. The impression of virtual environment was judged by the questionnaires. As a result, if the standing position in the patients is unstable before training, this can be improved after three weeks. Because the patient's trunk was kept in the center of the device by the holding arm, the patient's standing position was automatically settled. Also the trainer, having two separate belts, could train in the non-hemiplegic site only with fixing of the hemiplegic site. For the comments of virtual environments the patient replied the virtual system was not effective in training because of too simple pictures. While the trainer included both physical therapist and occupational therapist, the system was effective. Although image should be familiar to the patient, the image of the virtual environment gives higher motivation for the gait training.
Key words: walking training, virtual reality, hemiplegic patient, balance reaction.
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W. Matsumoto, Y. Higashi, T. Fujimoto, T. Tamura. The transfer activity to the car in stroke patients for developing the transfer-training simulator. Gerontechnology 2002; 2(1): 130. In the rehabilitation training for the post stroke hemiplegic patients, it is important to promote the participation to the society. One of the candidates of promoting the participation of the patient in the society is going out by car. In general, the hemiplegic patient who needs help for daily life often goes out by car. Those patients could not drive, so they often get on a passenger's seat or a back seat. It is necessary to care in several steps by the caregiver. We aimed to develop the training machine to support going out of the patients and the family by car. In a preliminary study, we investigated the difficulty of the activity during getting on and off to the car. The subjects were hemiplegic patients who used to ride a wheelchair and their family. As a result, patients with right-side hemiplegia intentionally required a long time to transfer from wheelchair to the car compared with those with left side one. The most difficult and time-consuming activity in both groups was 'boarded' on the car. In the questionnaire survey to the family, it was answered that much care was necessary for 'Boarding' and 'Sit on wheelchair '. In conclusion, in the guideline for training it is necessary to develop the training simulator in the hemiplegic patient to transfer to car.
Key words: societal participation, transfer training, stroke patient.
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T. Yuji, Y. Higashi, T. Fujimoto, T. Tamura. Development of an automatic angle-controlled bed using vital signs in the patient. Gerontechnology 2002; 2(1): 130-131. It is important to perform early ambulation in the patient with the acute phase apoplexy in rehabilitation. We usually observe vital signs, and then we train by setting the angle of Gatch bed. However, the setting of the Gatch bed was subjectively determined. The aim of this study was to develop the Gatch bed having automatic angle control mechanism. The system consists of Gatch bed, a gyro sensor, an electric sphygmomanometer, and a pulse oximeter. The gyro sensor was installed the backside of front part in the bed where the angle was changed and monitored. The vital signals of blood pressure, heart rate and SpO2 were monitored. The signals from both gyro sensors and vital sensors were transferred to PC and displayed on the LC panel. The user pre-setted the threshold values of vital signs by LC touch panel. During training, if the vital signal in the patient

shows above the threshold value, the angle of Gatch bed is immediately stetted down to zero degree. In contrast, if the vital signals do not exceed the threshold value, the patient continues to train and the angle of Gatch bed is upwards. In the preliminary study, we monitored the cardiovascular condition with the change in posture in the acute phase apoplexy patient. The system was operated without any trouble and the control mechanism worked properly, that is the angle could be controlled by pre-determined vital value.
Key words: monitoring, vital signs, automatic controlled bed, rehabilitation.
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D. Gavin-Dreschnack. A New Screening Tool for Adaptive Wheelchair Seating. Gerontechnology 2002; 2(1): 131. Research has indicated that older individuals who use wheelchairs, experience the majority of wheelchair seating problems, including difficulty in chair propulsion, unsafe transfers to and from the chair, postural instability, pressure ulcers, and discomfort. Only a few studies have investigated the benefits of modification of wheelchairs and most of those have focused on children and young adults with disabling conditions. Compounding the lack of focus on the older population is the lack of appropriate screening and assessments for use in long term care facilities, i.e., nursing homes. The Minimum Data Set (MDS), the comprehensive assessment of medical, psychological, and social characteristics of nursing home residents, does not capture residents' posture nor does it provide any correlation of their size and functional ability to appropriate wheelchair selection. As a result, the present study focused on development of the Resident Ergonomic Assessment Profile (REAP) for seating. The REAP was designed for ease of use by any level of nursing/caregiver staff to enable them to observe and record residents' sitting posture, and thereby make appropriate referrals to formal seating clinics. The domains of the REAP include: observation of: foot support, height and position of knees, height of armrests and position of arms, seatbelt presence, head control, leaning, sliding, ability and method of propelling, and history of falls. Pilot testing indicated that, although some raters did not receive training on wheelchair seating, the REAP produced high interrater agreement among levels of staff with varying knowledge of adaptive seating. The REAP appears to be a brief and reliable screen for observing and recording the anthropometric characteristics and functional posture and mobility of wheelchair-confined nursing home residents.
Key words: screening tool, resident ergonomic assessment profile (REAP), nursing home resident.
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K. Slegers, M. van Boxtel, J. Jolles, P. Houx. Increasing autonomy of older people through the use of computers and the Internet. Gerontechnology 2002; 2(1): 131 - 132. The rationale and design of a randomized intervention study are presented in which the effects are studied of use of computers and Internet on cognitive functioning in older people. 240 individuals (age 65-75) will participate. Most of them are interested in computers and Internet (n=180). All interested participants are randomly assigned to one of three groups: training + computer (intervention group); training only (1st control group); no training or intervention (2nd control group). The remaining group of 60 participants with no interest in computers or Internet forms a 3rd control group. The intervention group is provided with a computer and a fast Internet connection for a one-year period. The control groups will refrain from computer use for the duration of the

study. All groups are screened twice (dual baseline) pre-training for cognitive abilities, general health, social network aspects, functional status, and quality-of-life. Reassessment is performed at month 4 and 12. In addition to a basic neurocognitive test battery, participants will be compared with respect to everyday coping strategies, mood, and anxiety. The intervention group is expected to benefit from the Internet and computer facilities by showing a relative improvement in several domains of function: basic cognitive performance (executive function, sensorimotor speed, memory, attention), autonomy and everyday problem solving. Also, it is hypothesized that the intervention group shows less difficulties with operating modern technological appliances. Some baseline results will be discussed.
Key words: cognitive aging, autonomy, computers, World Wide Web, intervention study.
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F. Carlin-Rogers, J. Smither, S. Sauls, S. Samson, J. Guerrier. Evaluation of Promising Tools for Determining Fitness to Drive. Gerontechnology 2002; 2(1): 132. Measures of various individual characteristics have been developed to determine older drivers' fitness to drive. Some of these purport to predict drivers at risk of crashes. Indeed, the research has shown some significant relationships between crashes or other critical components of driving performance and such driver characteristics as status on the Useful Field of View (UFOV) test, Trails B, as well as contrast sensitivity. Other measures of attention and memory make similar claims. The availability of effective instruments that can permit the identification of drivers at-risk is an important consideration in assisting healthcare and social service professionals, as well as licensing professionals in determining driving fitness. These tools will be particularly helpful in providing to the professionals mentioned the tools necessary to assist older drivers in identifying appropriate means for addressing their safe mobility. In this regard, under grants by the National Highway Traffic Safety Administration and the Florida Department of Transportation, Safety Office, the Tampa Bay Area Agency on Aging, the University of Central Florida, and the University of Miami are currently collaborating on a study to determine the ability of computerized measures of attention and memory, and measures of visual functioning to predict crash risk in two groups of older drivers, a high MMSE group (28+) and a low MMSE group (< or = to 27).
Key words: driving, fitness, older driver, mobility, safety.
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R. Kaspar. Moderating effects of technology on the experience of loneliness in old age. Gerontechnology 2002; 2(1): 132 -133. Accelerated implementation of technology has changed many aspects of individuals' everyday lives as well as it has altered social relationships and contributed to the development of modern society as a whole. The ability to use complex technology has become a key competence for independent and successful living. Elderly people have often been hypothesized potential losers of this modernization process, as they are more likely to lack this competence (Reichert, 2001). Modern technology has often been linked implicitly to loneliness in older adults rather than its effects have been tested explicitly. Technical appliances have been discussed as both powerful means for directly maintaining social participation (e.g. telephone, internet) as well as endangering social integration (e.g. automatic teller machines, internet), thus hindering and enhancing the experience of loneliness, respectively. The objective of

this study was to investigate possible effects of technology on psychological components in the development of loneliness. Aspects of personality, social network, health status, as well as technological experience and technology acceptance were modeled as predictors of loneliness in older Germans. The sample consisted of 1,417 independently living individuals 55 to 98 years of age. Structural equation modeling was used to impose and test theoretical assumptions on moderating effects of technology on loneliness. Considered a construct sensitive to both societal and technological changes, perceived obsolescence prove to be a strong predictor for loneliness. Results indicate substantial impact of technology reception on the experience of loneliness in old age.
Key words: technology, old age, loneliness, obsolescence, societal participation.
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I. Alakarppa. The Acceptabilty of Assistive Devices. Gerontechnology 2002; 2(1): 133.
The goal of this research is to produce information on the factors that affect the use of assistive devices, their acceptance, avoidance, or rejection. Through this research, the answers to the following questions were sought; (i) Why do some aged people not want to use assistive devices for walking? (ii) How can the use of such assistive devices be promoted? Many studies have shown that the non-use or little use of assistive devices is a large problem. Several studies show that assistive devices intended to compensate for inability, for one reason or another are not used. An eight-person group participated in group discussions, moreover, five people in Northern Finland were interviewed in their own homes and 5 people were interviewed in Helsinki. A total of 37 people participated in the research (11 'user' and 26 'non-users'). The reasons for non-use can be roughly divided into six areas that result from (i) the product, (ii) the social and physical environment, (iii) the user, (iv) the system of health care, (v) guidance and the supply of information (marketing), and (vi) distribution. The use of assistive devices could be promoted by increasing the range on offer, as well as by focusing on marketing and end-users, by making the guidance on their use more efficient, by developing products in accordance with needs, and by supporting a user to start using the device in question. At the following stage of the study the mobility device has been developed on the basis of the results that have been obtained from the earlier study. One of the objectives of the follow-up study was to investigate the effect of the design style on the acceptability of the product. A method was developed for the determination of the pleasing style.
Key words: acceptance, assistive device, design, marketing, mobility device, walker.
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A. Mihailidis. Intelligent Supportive Home Environments For Older Adults With Dementia: Current And Future Research Gerontechnology 2002; 2(1): 133-134. The development of supportive environments for older adults with dementia is one of the key research areas in the new Biomedical Engineering initiative at Simon Fraser University. Our long-term goal is to develop an intelligent supportive home for older adults with dementia. We have started by developing a supportive environment in the washroom. The most recent computerized system monitored progress and provided assistance during hand washing. Using artificial intelligence, pre-recorded verbal prompts were automatically selected and played by the system in order to correct a user's error(s). The system also had the capability of learning about each user and

adjusted its parameters accordingly. The device was tested with 10 subjects with moderate-to-severe dementia. These subjects attempted to wash their hands with and without the assistance of the device in a study lasting 60 days. These trials showed that the number of handwashing steps that the subjects were able to complete without assistance from the caregiver increased overall by approximately 25 %t when the device was present. These positive results have prompted us to continue with this area of work. The next phase of research will include improving the current system that we developed in the washroom, and expanding this technology to other applications and aspects of the home environment. We feel that this area of research could have a positive effect on the lives of many people with dementia, as well as on their professional and family caregivers, and may result in people with dementia being able to remain at home.

Key words: supportive environment, smart home, cognitive device, memory aid, dementia.

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Symposium on User-centered design for independent living

V. Taipale. Combining Needs and Technological Opportunities for Success: User-centered design for independent living–a Finnish R&D approach. Gerontechnology 2002; 2(1):135. Aim of the symposia is to introduce and discuss how the user-centered design of gerontechnology products can be organized so that fundamental items like user needs, technological possibilities, usability, participation and ethics are not handled separately but build directly in to the research and product design processes. The symposia will introduce thorough approaches which have been created and successfully gained evidence during the last ten years in Finland, and in European collaboration.
Key words: user orientation, usability, social participation.
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V. Taipale. How research networks and collaboration are organized in European Research Area. Gerontechnology 2002; 2(1):135. European Research Area (ERA) is a new concept in European research. It will strengthen the networking capacity of European researchers, and develop methods for Member States to collaborate closer. The new instruments include Centers of Excellence with partners from several countries and several research institutes or research groups within the countries. The ERA will also develop large-scale integrated projects. As COST (Cooperation in the field of Scientific and Technical Research) -structure has already more than 30 years enhanced European research cooperation, there are already good opportunities, skills, and capacities to develop networks within EU 6th Framework Programme (PF). In the field of gerontechnology these new instruments will enhance cooperation and comparative, multidisciplinary research. However, the competition is hard and the results from the 5th FP are not as good as expected.The presentation will analyse the instruments of research policy on EU and national level and refer to an impact assessment of Key Action 6," the Ageing population and their Disabilities" especially in the field of gerontechnology.
Key words: network, collaboration.
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J. Ekberg. European wide Collaboration for Older People. Gerontechnology 2002; 2(1):135. The presentation will show how European research has approached the prerequisites for creative use of technology for better aging and independent living by: (i) collecting pan-European statistics on older peoples needs and attitudes, (ii) producing guidelines for how to design products and services, (iii) developing tools for integrating the guideline requirements into design tools, (iv) providing Good Practices and Design for All information to stakeholders, (v) setting up a European center of excellence in Design for All network.
Key words: social participation, older adults.
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S. Väyrynen, J.M. Härö. Ergonomic Approach for Developing Diverse Products Aimed at Aged Users – Review on Cases and Literature. Gerontechnology 2002; 2(1):136. The paper is a review of 10-year experiences in the field of user-centred product development for aged users in Northern Finland. The main focus is in methodology and especially in high and low tech product cases. The methodology is based on international literature. The results and lessons learned will be discussed.
Key words: product development, older adults.
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M. Vaarama. Collaborative design of Information Systems for Care Management – European experiences. Gerontechnology 2002; 2(1): 136. Presentation introduces and summarises experiences of three experiments in developing IT-tools for management and performance evaluation of care services for older persons, exploiting also Internet. Special focus has been on linking the client needs, care supply, and cost-effectiveness of care to develop tools that can support care managers in their practical work. The development method has been a collaborative, iterative process of specification of user (care manager's) needs, definition of concepts and measures, system-specification and design-test-re-design of the IT-tools. To meet the true needs of care managers, we have taken care of active user involvement, stakeholder empowerment, and co-operative approach between all stakeholders. The projects have resulted to marketable products that also are used by practice, and to a useful framework for any multi-user, even multinational R&D project.
Key words: collaborative design, ICT, care, older adults.
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V. Tornberg, S. Väyrynen. Experiences and Examples from Versatile Cluster Development on the Area of Ageing and Technology. Gerontechnology 2002; 2(1): 136. The presentation introduces practical experiences on how user-centered design of gerontechnology products have been organized as versatile cluster development in a national technology development program in Finland, and also some concrete and successful examples of products resulting from recent research and development activities of the program.
Key words: ageing, technology.
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I. Alakärppä, L. Kovanen. Assessing the appearance of a product in the product development process together with aged user. Gerontechnology 2002; 2(1): 137. The aim of this study was to investigate the significances arising from the appearance of a product and their impact on product acceptability. The forms of the product were assessed in an interview survey with the help of sample pictures. The article deals with the process of assessing the significances of the product's appearance and the method used in this as well as the results of the interview survey.
Key words: product development, older adults.
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Nursing Home Symposium

K. Curyto. Bringing Technology into the Nursing Home: Barriers and Opportunities. Gerontechnology 2002; 2(1):138. There is a gap between technology products available to society in general and what is available specifically for older adults. The institutionalized and cognitively impaired are particularly excluded in this regard, and the challenges in applying new technology to this group can be formidable. However, gerontechnology offers numerous possibilities in providing comfort, safety, and improved communication and physical functioning to this traditionally underserved population. Discussion will synthesize presentations with an aim toward identifying barriers, solutions, and opportunities for bringing technology to the nursing home setting.
Key words: long-term care, assisted living, nursing home, Alzheimer's disease.
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K. Curyto, K. van Haitsma. The implementation and evaluation of passive monitoring and computer-based nurse-call technology based on resident movement for use in improving safety and quality of care in persons with dementia. Gerontechnology 2002; 2(1): 138. Drs. Curyto, Van Haitsma, and Hodgson will be discussing the implementation and evaluation of passive monitoring and computer-based nurse-call technology based on resident movement for use in improving safety and quality of care in persons with dementia. They will also discuss the possibilities of using a facial recognition biometric surveillance technology in monitoring entry and egress from high risk exits in their nursing facility.
Key words: monitoring, long-term care, nursing home, dementia.
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B. Roos, J. Ruiz. The use of computers, the Internet, and CD-ROMS for staff training, care enhancement, and facility organization and management in the long-term care setting.Gerontechnology 2002; 2(1): 138. Drs. Roos and Ruiz will present and demonstrate the use of computers for training and for care enhancement in the long-term care setting, a broad topic that will encompass computers and the Internet in the nursing home for education and facility organization and management; CD-ROMS and other approaches to computer-assisted training in dementia and other major long-term care topics; and computers and the 'cyber café' as approaches to improve the quality of life of long-term care residents.
Key words: training, computer assisted, long-tern care, nursing home.
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J.A. Sanford. The application of activity-monitoring technology in the nursing home setting and the barriers to use among residents with dementia. Gerontechnology 2002; 2(1): 138. Mr. Sanford will be presenting on the application of activity-monitoring technology in the nursing home setting and the barriers to use among residents with dementia. He will discuss the potential use of wearable devices to measure health benefits of going outdoors by monitoring activity, light, and sleep levels among nursing home residents.
Key words: monitoring, nursing home, dementia.
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Discussant: J. Coughlin

Auditory and Visual Acuity in Aging

T.L. Mitzner, W. Rogers. Effects of Contrast Reduction on Reading Strategies of Young and Older Adults. Gerontechnology 2002; 2(1): 139. People often read in sub-optimal conditions, such as reading in a room that has inadequate lighting. Poor lighting conditions can reduce the contrast between text and its background making it difficult to perceive and may result in reading problems unless a reader is able to compensate. Semantic and pragmatic information contained in text can be relied upon to facilitate reading and this contextual utilization reading strategy may be particularly advantageous when text is visually degraded. This study explored contextual utilization and the effects of various degrees of contrast reduction on young and older adults' reading times and comprehension. Sentences were presented word-by-word at a self-paced rate. Target words varied with respect to their predictability based on the sentence context in which they were presented. Text was presented in three levels of text/background contrast (high, medium, low). A blocked design was used for the contrast manipulation to explore whether reading strategies changed based on the presentation order of the text/background contrast levels. The results are discussed within the framework of current cognitive aging theories. The implications of this research for computer-presented text design guidelines will also be discussed.
Key words: aging, reading.
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K. Sagawa, H. Ujike, T. Sasaki. Visual acuity and minimum readable character size as function of age. Gerontechnology 2002; 2(1): 139. Visual acuity is a fundamental visual function to obtain spatial information such as characters in visual signs, and this function changes with age because of a loss of elasticity and transmittance of the eye lens. This makes it hard for older people to read small characters especially at near sight. The present study was aimed to clarify the quantitative characteristics of the loss of visual acuity with age for a large variety of viewing conditions and to provide a formulation for a minimum readable character size at any age and any condition. To investigate a correlation between visual acuity and readability of characters, an experiment was carried out to get data on visual acuity at variable viewing distance (0.3 to 5 m) and variable luminance (0.05 to 1000 cd/m2) for a number of 111 people from 11 to 78 years old. Using the same experimental condition and observers, the experiment was expanded to get data on readability on a single Japanese character classified into three groups in figural complexity. From these data the minimum readable size was derived as a function of age, viewing distance, and luminance. This formulation for minimum readable character size will be useful in designing visual signs such as traffic signs as well as labels on electric appliances for better visibility for older people.
Key words: visual acuity, character readability, minimum readable size, age.
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Y. Inukai, H. Taya, K. Sagawa. Threshold, Unpleasantness and Subjective Acceptability of Low Frequency Sound in Older Adults. Gerontechnology 2002; 2(1): 139-140. Low frequency noise below 100Hz is often very annoying to some persons, but the available psychophysical data are relatively small and the standard method of evaluation has not

been established. Especially, it is almost unknown how the sensitivity to low frequency sound changes in older adults. In order to investigate sensory thresholds and subjective evaluations of low frequency pure tones in older adults, thresholds and equal unpleasantness sound pressure levels of pure tones from 10 Hz to 100 Hz were measured in 23 older adults with ages from 60 to 75. In addition, the maximum acceptable sound pressure levels at the low frequencies were measured, assuming the situations of a living room and a bedroom. The obtained results were compared with the younger adults' data from our previous experiment. It was shown that older adults' thresholds at low frequencies were higher than those of younger adults. But the dynamic ranges of unpleasantness were narrower and the maximum acceptable sound pressure levels were not necessary higher in older adults than in younger adults. The relations of the results with the hearing levels of the participants were examined, and the method of evaluation of low frequency sound for older adults will be discussed.
Key words: low frequency noise, older adult, threshold, acceptability, hearing level.
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K. Kurakata. A Sound Level Meter Based on the Auditory Characteristics. Gerontechnology 2002; 2(1): 140. The sound level meters in current use employ frequency-weighting networks for A-weighting characteristics as prescribed within industrial standards. However, A-weighted sound pressure levels sometimes show large deviations from the loudness perceived by elderly persons. This is because the weighting function was determined based on the frequency sensitivity of young people, rather than on that of the elderly with hearing loss. It is therefore necessary to consider the changes in sensitivity due to aging in order to properly evaluate loudness perceived by the elderly. In this presentation, after first presenting some psychoacoustic data indicating changes in loudness perception with aging, a possible method of developing a sound level meter for the elderly will be introduced. Then validity of the method will be discussed based on some experimental results with young and elderly listeners.
Key words: hearing loss, loudness perception, sound level meter, noise evaluation.
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Computer Usage

A.S. Melenhorst. When do seniors choose the Internet? The role of communication goal and user experience. Gerontechnology 2002; 2(1): 141. Perceptions and experiences of both usability and usefulness motivate or discourage older adults to use the Internet. The present study focused on Internet usefulness, or benefit. Thirty older Internet users and non-users aged 60-74 years evaluated traditional media and Internet applications for different communication purposes in their own everyday lives. The amount of Internet experience as well as the goal of the communication affected their judgments. The Experience _ Goal interaction revealed users' considerations leading to differentiated judgments: Experienced users valued Internet applications higher than less- and non-experienced users, but not for every purpose. Major considerations of users and non-users were benefits of the Internet depending on the goal of the communication, but also on the establishment of the medium in their social environments. The results of this study indicated a selective Internet use by older adults, explained by their benefit-driven approach of media, and in this respect their specific social preferences and communication priorities.
Key words: World Wide Web, older adult, experience, usefulness, communication.
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M. Nagamachi, S. Ishihara, K. Komatsu. Elderly People's Motivation Change Process and Psychological Barrier to the Net. Gerontechnology 2002; 2(1): 141-142. Kimita village is one of the most aging village (over 65; 34.7%) in Hiroshima Prefecture. Internet environment was introduced to homes of elder residents by community office and a telephone company. We have been promoting teaching manipulation of kinds of terminals/PCs, and giving aids to solving many troubles around net usage. In this report, we present psychological attitude and barriers, motivation changes and expectancy to the Net; those were founded in a longitudinal study. (i) Survey of expectancy to Web contents. We had a questionnaire study asking needs to web contents to all residential households including net user and nonuser. By omitting error answers, the sample number was 247. Over 60s rated high on 'health', 'local politics', 'nursing-care insurance' and 'daily living'. We concluded that health and medical services, local politics and farming information should be provided to elder persons of Kimita village. Then, many of them were provided on village web site. (ii) Computer literacy and Psychological-Barrier survey. Student volunteers frequently visited elder's houses and taught how to use PCs and the net. In a year of the experiment period, they kept journals. After experiment, the volunteers asked to have a discussion and picked up keywords from the journals. Then they classified each keyword and tracked each case on keyword mapping. From classified keywords, we consider factors of attitudes to the net. They are Expectancy (for specific information), Frequency of usage, Positive/reluctant to use the Net, Literacy improvement and Anxiety or uncertainty to use PC. The elders who acquired PC and net skill commonly have strong interests and clear aim. By such aim, they could get over operation and minor machine troubles. In elders who gave up the net (who could not acquired skill), we find several reasons for motivation decline and psychological barriers, such as 'not related to (my) job', 'ill-health' and 'machine trouble'. We concluded that there are two keys for promoting the net for elders. One is making attractive contents for elders. It is highly depends on local cultures, community, and daily job. The other is immediate visiting technical support. It is the key to prevent fear to PC and the net.

Key words: www, computer literacy, psychological barrier, elder, village, content, survey, PC.
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R. Fukuda, H. Bubb. Analysis of difficulties in Web use for elderly people. Gerontechnology 2002; 2(1): 142. Nowadays the World Wide Web is one of the most popular services in Internet. However, its usability is still under discussion. Because of confused site structure and insufficient navigational aids users loose sometimes their orientation and cannot find the information they need. If they found some information, they are confronted with the inconvenient page design. There are two problems with the conventional studies on Web use analysis. The first problem is the lack of objective evaluation. The subjective evaluation based on questionnaire or interview provides useful information, however, it is not convincing enough . The second problem is that such studies target mainly on younger people. The aging process cause some specific difficulties for elderly people. These difficulties should be treated in order to consider the demands of the continuously increasing elderly user population. To solve the above two problems, we analyzed the information retrieval in electric timetable of three public transport information sites using eye tracking and compared elderly with younger users. As a result, it is clarified that the eye movements are directly influenced by page and also by navigation design. The small characters, inconvenient location of navigation tools, ambiguous terms, and inappropriate navigation possibilities cause longer fixations, more eye movements, longer time to accomplish each task, and more errors. Based on these results recommendations for improved Web design are proposed.
Key words: World Wide Web, navigation, user interface, eye tracking.
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G. Vanderheiden, D. Kelso, K. Barnicle. A Natural Accessibility Interface for Voting System. Gerontechnology 2002; 2(1): 142. Building accessibility into voting systems has taken on new significance with the increasing elder population and recent problems in voting. However, directly applying access techniques from other technologies to voting is unlikely to be effective given the peculiar nature and constraints of voting. These include the sudden introduction of a new technology, lack of any training, lack of awareness of poll workers to disability issues, aversion of elders to identify any functional limitations, prevalence of multiple disabilities, and need for near absolute accuracy (confusion and error in using the device are likely to cause significant backlash). This paper describes an approach that might be called 'natural accessibility' that addresses these and other issues by creating a voting interface that is easy and efficient for voters without functional limitations but also is flexible enough to work for voters with poor or no vision, reading skills, or hearing, and poor or very limited physical control or reach. The system does not have any specific disability modes. There is just one mode of operation for all users, with a flexible interface to accommodate users abilities (e.g. able to use touch screen or arrow buttons to choose candidates, making fonts bigger, etc.). The design and cuing are based on 10 years of no-training, walk-up-and-use, cross-disability interface design research. Testing includes use (without instruction) by elders who have never used a computer or electronic voting machine and must use the device without vision, without reading, or without hearing.
Key words: access, voting, ADA, visual impairment, hearing impairment, reading, physical impairment.
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Telehealth

P. Whitten. Telehome Health for COPD & CHF Patients in Michigan. Gerontechnology 2002; 2(1): 143. Purpose: The goal of this NIH-funded project is to conduct a study on the impact of tele-home health services for COPD and CHF patients in Michigan's Upper Peninsula. Subjects receive a home-based telemedicine unit that transmits video, audio, and vital sign data through the analog phone line in their home. Specifically, the researcher is evaluating patient data availability and frequency, access to services, increased medical outcomes and functional status scores, required delivery resources, and acceptance. Methods: Each patient diagnosed with COPD and/or CHF who is prescribed home health services from a physician is randomly assigned into a control group receiving traditional home health or an experimental group receiving a combination of telehome and traditional services. The majority of the data are extrapolated from patients' charts. Additional data are collected via pre and post SF 36 survey, as well as through patient and provider interviews. Results: Preliminary data analyses indicate that telehome health offers increased access to a range of home health providers, provides a secure means to gather and store patient vital sign data on a more frequent basis, results in lower incidence of hospital admissions and ER visits, and provides an acceptable means of delivering care for both patients and providers. In addition, results indicate that additional planning and resource requirements (e.g., space, telephone lines, personnel) appear for this delivery modality.
Key words: telemedicine, telehome, access, delivery issue, health outcome.
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D. Perdomo, S. Czaja, M. Rubert. Tele-REACH: A Telephone Intervention for Caregiver. Gerontechnology 2002; 2(1): 143-144. Nearly 25.8 million informal caregivers, i.e. spouses, adult children, and other relatives and friends, care for a person age 50 or over with a disability or chronic illness. The existing literature on caregiving networks consistently reports that there are increasing numbers of caregivers who find themselves alone in the process of caring for their disabled elderly. Many caregivers, such as family caregivers of Alzheimer's patients are homebound because of social and logistical factors and are less likely to be reached by traditional supportive services, such as support groups, educational workshops, case management and counseling services, etc. These 'sole' caregivers are not able to attend support groups because they do not have anyone to leave their loved ones with, have their own physical limitations, time constraints or scheduling conflicts, face emotional and economic problems, and/or lack the knowledge to seek the appropriate supportive services. The Tele-Reach project was developed to aid and support the needs of this group of caregivers. The goal of the Tele-Reach intervention was to provide 'sole' caregivers the opportunity to gain access to a range of information and supportive service agencies, and participate in a psycho-educational support group at flexible times and from the convenience of their home through the use of a customized Computer-Telephone Intervention System (CTIS). The CTIS is 24 hour a day information network system based on computer-telephone technology. The system uses a screen phone, which "marries" basic telephone use with interactive computer technology. The CTIS is menu driven and allows users to place and receive calls, send and retrieve messages, access databases, and conference with several people simultaneously. Tele-Reach caregivers were provided with information via voice and text menus, tailored to the user's menu choices and language. This paper presents the findings of the Tele-Reach intervention and the following research objectives: (i) To evaluate the efficacy of the Tele-Reach intervention for 'sole' caregivers; (ii)To evaluate eth-

nic differences in response to the Tele-Reach intervention; and (iii) To evaluate the feasibility of delivering a psycho-educational training sessions via the CTIS.
Key words: caregiving, intervention, communication, support system.
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M. Rubert, S. Czaja, S. Walsh. Tele-Care: Helping Caregivers Cope with Cancer. Gerontechnology 2002; 2(1): 144. Caring for a terminally ill cancer patient presents personal, social, and economic hardships for family members and logistical factors can prevent caregivers from getting help, especially elderly spousal caregivers who may have medical problems of their own. Our prior work has shown that computer and communications technologies can be used to help caregivers of persons with dementia. We have now employed these technologies to family caregivers of persons who are seriously ill with cancer and the purpose of this presentation is to describe the implementation of a telephone-based group intervention for those caregivers. The group intervention was administered through 10 sessions of support and educational guidance which were delivered using a computer/telephone system. Each caregiver received a screen phone which supports the transmission of voice and text-based information. The screen phone allows the caregiver to access the Tele-Care System functions which include the weekly group 'meeting', a special on-line resource guide for caregivers of persons with cancer, individual calls to other members of their group and other messages and reminders. Examples of the use of the Tele-Care system by the caregivers and the impact of the intervention on caregiver health, burden and depression will be discussed.
Key words: caregiver, communications technology, cancer, depression, burden.
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J. Sanford, P. Daviou, M. Jones. Using TeleRehabilitation to Provide Home Environmental Interventions. Gerontechnology 2002; 2(1): 144. Home environmental interventions can be an important part of a rehabilitation strategy to facilitate aging in place. However, widespread implementation of environmental interventions has not yet occurred. A major reason for their underutilization has been difficulty in accessing services, particularly for those living in remote areas, due to a lack of experts and fragmentation of the delivery system. The purpose of this project was to determine the feasibility of using teleconferencing technology to perform home assessments and recommend environmental modifications for individuals prior to their discharge from a clinical setting. A two-stage standardized protocol was developed. The triage stage identifies barriers in the home through photographs and feedback from the individual and family members. The follow-up assessment provides detailed descriptions of barriers, including critical measurements (e.g, height of steps) and spatial relationships (e.g., room layout) via teleconferencing. Testing by occupational therapists (OTs) has shown that information collected and interventions based on the teleconferencing protocol have high criterion validity (>90%) when compared to those based a traditional on-site assessment. The pilot data from this project demonstrated that teleconferencing is a potential tool for reducing environmental barriers. Based on the results of this project, a new randomized controlled study has begun to evaluate the efficacy of using telerehabilitation technology to support a home environmental intervention by OTs targeted at improving functioning of older adults after discharge from a medical unit.
Key words: aging in place, telerehabilitation, telehealth, occupational therapy, rehabilitation.
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Symposium on Domotics and Networking

W. Friesdorf, K. Fellbaum, S. Meyer, M. Hampicke, W. Rossdeutscher, G. Vanderheiden, H. Mollenkopf, E. Schulze, B. Schadow, H.-W. Wahl, A. van Berlo. Domotics and Networking. Gerontechnology 2002; 2(1): 145. This symposium is divided into 2 parts. Part 1 concerns today's state of the art in the domotics area. After a general view of smart home (domotics) concepts, the first presentation introduces the idea of networking (e.g. technical, man-machine, research, multidisciplinary and social networks) and describes why it is an important and challenging task to harmonize and integrate these different networks. As an example of an interdisciplinary research network in the domotics area, the German project SENTHA (Seniorengerechte Technik im häuslichen Alltag, Everyday Technology for Senior Households) is described. The second presentation focuses on social and socio-demographic aspects with the accent on the elderly and the disabled. In conclusion, the needs and desires of these persons for new technology are outlined. The third presentation discusses human-computer interaction (mainly voice- and video-based) and illustrates that the quality of this interaction strongly influences user acceptance. Finally, the fourth presentation reports on emergency-call systems, which play an extremely important role for seniors and disabled persons. Part 2 consists of a description of future technology in domotics and a panel discussion. Topics include self-adapting components, intelligent agents, WLANs, smart clothes and environment control systems. The main focus of the paper is a description of technological innovations which are still in development and might sound futuristic. The next presentation, which serves as a counterpoise to the first one, predicts future societal trends and the expectations of the next generation of domotics users. We intend to make these presentations controversial and enjoy those attending to take issue with the speakers. The panel discussion, will bring together scientists of different disciplines, will critically comment, complete and summarize the presentations of Part 1 and 2.
Key words: domotics, networking, emergency call systems, user interface, societal trend.
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W. Friesdorf. SENTHA - A German research project in the field of domotics and networking. Gerontechnology 2002; 2(1): 145-146. A full, safe and healthy life, independent in self-determination - as long as possible - that is the goal of sentha. Sentha stands for a public funded research project which aims to work out rules for the design of domotics and services according to the requirements of the elderly. The multidisciplinary approach brings together 8 research departments with their very different theories, knowledge, and methods from engineering, social sciences, ergonomics and design. What did we learn in the past 5 years? (i) We should not focus on the restrictions of the elderly but foster their resources; (ii) The elderly should be discovered as an own target group. 'Design for all' fails; (iii) Smart and trendy solutions instead of stigmatisation is the design strategy; (iv) Products and services should be adapted to and integrated into smart home concepts. The potential of synergy is fascinating; (v) Usability tests have to take user cases into account based on situations and tasks of the daily living of the elderly. Empathy is required. (vi) Active participation of the elderly is needed to develop their products and services. Sentha has activated the elderly - an important side effect. They are no longer 'used' as test persons but, in a first step, they have built up their

own 'sentha senior research group', which is becoming a very strong movement.
Key words: domotics, social network, elderly.
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S. Meyer, E. Schulze. Smart Home and the Aging User - Trends and Analyses of Consumer Behaviour. Gerontechnology 2002; 2(1): 146. BIS pursues two-fold goals in its empirical studies on Smart Home, which are conducted regularly: first, to collect data on consumer needs as related to Smart Home applications, and second, to understand the acceptance of Smart Home products. The lecture will present results of the latest survey data (2001and 2002) on Smart Home, including both consumer awareness of Smart Home and consumer acceptance of networked systems. Analysis focuses on which particular Smart Home features the user finds most convincing, and which are less relevant. Focus will be the Smart Home Acceptance of different age groups, household types and lifestyle patterns. The presented data are based on a specific approach to the area 'Smart Home' consisting of a match of the variables 'everyday life', 'household type', 'lifestyle', and 'technology biography'. This approach assumes that it is the pressures of everyday life faced by different individuals (across a range of household types) that call forth distinct sets of demands on technologies and services. The data again shows that the user-friendly operation of devices and systems is a decisive factor for the actual acquisition and application by the user, especially by the elderly. The linkage of in-house networks with the information highway is another essential factor. The future of in-house networking continues to stand in direct relation to the development of services for private households.
Key words: smart home, acceptance, smart home products, household type, lifestyle.
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M. Hampicke, K. Fellbaum. Human-Computer Interaction in a Smart Home Environment. Gerontechnology 2002; 2(1): 146. Smart home systems are primarily designed for the support of persons in their daily life, above all, they improve comfort, communication, safety and security, and energy saving. In general, a smart home system consists of a network which connects control modules like sensors and actuators, visualization units, communication systems, household devices, and many others. The heart of the network is a central processor which acts as a general supervisor and this processor is the communication interface to the human user. In our case, the target group are the elderly persons. These persons are normally no computer experts which means that the operation procedures must be extremely simple and, if possible, widely self-explaining. As a second consequence (of our target group), all system components have to be very reliable because in the case of a malfunction these persons cannot perform any repairing work. The scope of our paper is twofold. Firstly, we will present an actual state of the art in smart home devices and networks with a special accent on speech communication systems (speech and speaker recognition, speech synthesis). One example, which is part of our research project, is an ordinary remote control module for operating a tv device but this module has also many other (mainly voice-controlled) functions, for example environment control, entrance control, telephone and video telephone operation and memory functions. Secondly, we will discuss the interface problems between elderly persons and a high tech smart home system. It will be shown that in many cases a voice control is the most natural and easiest operation mode.
Key words: smart home, remote control, speech recognition, speaker recognition.
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W. Rossdeutscher, B. Schadow. Emergency call systems (systems based on human bio signals, user adaptation, location-aware systems). Gerontechnology 2002; 2(1): 147. Increasing networking within wide areas of technique enables the application of efficient person emergency call systems. The current state of the art will be pointed out and some available systems will be described. Past systems are usually released by pressing the button of a so-called radio finger. In case of emergency fast and secure help is needed. Particularly older persons with handicaps or persons who had an accident are most often not able to manually release this button. For this reason the automatic detection of a case of emergency is of vital interest. Even multiple vital parameters give no reliable indication. The combination of smart home parameters with vital parameters, however, seems to be the step forward to the secure recognition of a case of emergency. Smart home parameters of a location-aware system may be: activity, consumption of water and electricity, opening or closing of doors as well as the usage of household appliances and consumer electronics. Possibilities by measuring and analyzing suitable parameters are described. These parameters have to be processed by an intelligent, trainable system, which is adapted or is self-adaptable to the individual medical conditions and individual behavior of the user. This should be done in the de-central in-house smart home communication center.
Key words: emergency call system, smart home, location aware system, human biosignal.
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G. Vanderheiden. Future developments in technology (intelligent agents, smart clothes, scenarios). Gerontechnology 2002; 2(1): 147. Rapid advances in electronic and biological technologies are creating new potentials for Domotics. These have the possibility of completely redefining assistive technologies, their role, their effectiveness, and their acceptability. New network and interface standards and product designs will allow mainstream device control from a wide variety of sources, without custom modification. New interface technologies from voice to direct brain control will provide new access strategies for individuals with severe motor restrictions. Telecommunication advances will allow the transport of support services to any location that an individual may find themselves in. Agent oriented interfaces can allow assisted operation of devices that were beyond the comprehension of many users. This includes both home technologies and technologies faced by users as they venture forth into the environment.
Miniaturization and alternate display technologies can make products more convenient and more invisible – making them more acceptable where they are effective.
Networked services on demand and 'try harder' features can combine with packet based communication networks to allow users to call up a wide range of services as (and only as) they need them, with an easy escalation path if simpler services fail to be effective. Of particular interest are the technologies that can allow 'Companion' functionality to allow maximum independence for the users, maximum but scalable support services, and minimum monitoring or control.
Key words: domotics, assistive technology, home services, user interface.
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H. Mollenkopf, H.-W. Wahl. Future Societal Trends and Expectations of the Next-Generation Older Users of Domotics. Gerontechnology 2002; 2(1): 147-148. For some years now we have witnessed the development of new technologies which will greatly

affect all domains of private and public life and hence, the living conditions of the aging population. New technologies, in particular 'intelligent' household technologies and information and communication technology applications, will provide important opportunities in the fields of prevention, compensation, and enhancement through their potential to facilitate many aspects of daily life like housing, mobility, communication, and learning. These technological advances will at the same time meet new generations of older men and women who will have experienced industrialization and mechanization of the private domain and of working life. They will have acquired different competencies and attitudes in terms of health, autonomy, and lifestyles as compared to the present generations of older people. Against that general background, we will use in this presentation four lines of arguments and questions to highlight the potential and limits of the forthcoming technology trends for future aging populations: (i) Users and nonusers - or: How to avoid a growing gap between the haves and have-nots? (ii) Dependency and autonomy - or: How to avoid new dependencies due to technology while autonomy will be enhanced at the same time? (iii) Support and Nonsupport - or: How to avoid a too strong focus on compensation instead of stimulating 'growth' by technology? (iv) Technology euphoria and sensible living - or: How to avoid expectations that technology will automatically lead to better aging?
Key words: domotics, future generations, autonomy, dependency.
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Health Supports

T. Tamura, T. Yoshimura, M. Nagaya, K. Chihara. A Fall Analysis System. Gerontechnology 2002; 2(1): 149. It is reported that the fall is a great reason of the bedridden next to the cerebrovascular accident. Thus the prevention of the fall is an important issue to reduce the bedridden, and elderly people improve their quality of life. The traditional method of a fall detection is an epidemiological survey by the questionnaire or an observation for unexpected falls. It is difficult to determine the underlying causes of the fall by epidemiological survey, because this result depends on the subject's memories. To determine the underlying causes of the fall, the measurement of the impact acceleration is proposed. It is desirable that system must be work for a long time without discomfort, because the fall does not frequently occur. Therefore, it is important that the monitor is small and lightweight. The aim of this study is to develop an ambulatory fall analysis system, which records the impact acceleration, fall direction, and fall time by accelerometry. We developed the system consisted of tri-axial accelerometer microcomputer and data logger. The developed system was tested in elderly outpatients with Parkinson disease. We have detected 19 out of 22 falls. From the result, this system may be useful to analyze the characteristics of falls including fall direction, time and gait analysis before fall.
Key words: elderly, fall, fall analysis system, accelerometer, impact acceleration.
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L. Normie, M. Topping, T. Soede, J. Sánchez-Lacuesta, W. Harwin, J. Pons, M. Manto, J. Williams, S. Skaarup. Smart Orthotics for Active Suppression of Pathological Tremor. Gerontechnology 2002; 2(1): 149. Everyday activities of daily living present a formidable challenge to victims of Parkinson's disease and other age-related neurological conditions resulting in pathological tremor. Approaches introduced with variable success to relieve tremor include drug therapy (still the most common treatment) and surgical procedures such as thalamotomy and, more recently, deep-brain electrical stimulation. In addition, various noninvasive methods have been investigated for mechanically damping tremor but, so far, no truly effective therapeutic device of this type is available. Although active cancellation of the indirect effects of tremor in man-machine interfaces has been widely investigated, virtually no work has addressed the problem of the direct suppression of upper-limb tremor by active mechanical means. This paper presents preliminary results of the system requirements phase of DRIFTS (Dynamically Responsive Intervention For Tremor Suppression), a multinational 3-year project supported by the European Commission's Fifth Framework Programme. The ultimate goal of the project is to develop a smart orthotic system that actively arrests upper-limb tremor whilst preserving normal movement. The new active orthosis is to be constructed of composite fabrics embedded with a network of sensors and 'soft' actuators and will be wearable underneath conventional clothing. The DRIFTS project is a collaborative endeavour of nine participants in six countries and draws upon diverse knowledge and skills in the fields of materials science, neurophysiology, rehabilitation engineering, cybernetics, mechatronics, and ergonomic design.
Key words: tremor suppression, Parkinson's disease, active orthotics, rehabilitation.
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S. Tsukamoto, M. Nambu, K. Nakajima, T. Tamura. A Simple Evaluation Method for Pressure Distribution. Gerontechnology 2002; 2(1): 150. The prevention of pressure sore is important issue for bedridden patients. The pressure sore arises by various reasons, e.g. pressure, humidity, existence of joint contracture, or nourishment etc. Actually, to prevent a pressure sore, caregivers change the patients posture every two hours and pressure must be under 32 mmHg at contact points. However, the result of the treatment is difficult to be judged since the pressure distribution existing over the patient's body is not measured. Recently, the body pressure distribution can be measured by using a pressure sensitive, tactile sensor sheet. The obtained pressure distribution is two-dimensional, and there is no standard with which to evaluate such pressure distributions and results of postural changes every two hours still cannot be discussed to be adequate or unnecessary treatment. In this study, we propose a simple evaluation method to evaluate the pressure distribution in tactile sensors. The method focused on the steepness of pressure gradients and the magnitude of applied force at defined local areas. In the preliminary experiment, the proposed indices reflect reasonably well the influence of posture for individuals, and positioning without any further optimization was insufficient to relieve fully regions of concentrated pressure.
Key words: pressure sore, tactile sensor, concentrated pressure, evaluation.
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D.A. Ross. Dark-Adapting Glasses for Older Adults with Low Vision. Gerontechnology 2002; 2(1): 150. (i) Objective of Project: The purpose of this work is to adapt new ElectroChromic (EC) technology for use as a fast-darkening coating for eyeglasses. The objective is to meet the needs of older people whose eyes adjust more slowly to changes in lighting and whose ability to function under a wide range of light levels has diminished.(ii) Methodology: VA investigators are currently collaborating with Ashwin-Ushas Corp. on a Phase Two NIH-NEI SBIR project to adapt Ashwin's existing fast-darkening EC technology for use as a thin-film coating for prescription lenses. Prescription lenses coated with this EC material will be constructed for 100 older test subjects with low vision. Electronics for controlling these lenses will be miniaturized and integrated into glasses frames. Measures of functional vision and mobility will be taken under a variety of outdoor and indoor lighting conditions. To demonstrate the benefit of wearing EC glasses, subject performance while wearing EC-coated lenses will be compared to baseline measures (no sunwear) and measures taken for subjects wearing the best existing sunwear available. (iii) Results to Date: Previous work demonstrated the benefit of fast-darkening lenses for many aging persons, particularly those with macular degeneration. However, the weight of the prototype was a problem for many. Working with Ashwin-Ushas Corp., investigators have now developed a very thin, light-weight plastic coating for prescription lenses. Initial participant testing results will be available by August 2002.
Key words: elder vision, older user, macular degeneration, light adaptation.
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Creativity and Socialization

A. Rogers, K. Hammond, K. Hyer. Using Technology to Engage Senior Learners: A Model. Gerontechnology 2002; 2(1): 151. Cognitive decline with age is neither inevitable nor irreversible. Research on successful aging suggests that older adults can protect and preserve functioning level through challenging intellectual stimulation, thereby inciting a cycle of maintenance or even enhancement of mental function: regardless of your current ability, the more you can do, the more you preserve; the more you preserve, the more you do. While community dwelling seniors may have a variety of intellectually engaging opportunities at their fingertips, those living in continuum care retirement communities (CCRCs) may be less apt to drive or to leave an environment that provides for all their physical needs, but often lacks opportunities for life-long learning. University of South Florida is currently testing a model that utilizes readily available and low cost technology to bring intellectual engagement to place-bound seniors. This project brought two undergraduate level humanities courses to 140 residents of two area CCRCs through a series of videotaped lectures of for-credit classes, followed by peer-facilitated discussion groups. Florida's Senior Citizen Tuition Waiver program allowed the courses to be offered to most residents at low to no cost; a community-university partnership grant allowed for the development of learner and facilitator discussion manuals. CCRC residents were trained to facilitate discussions utilizing resident experiences and education. Results of 140 participant demographics, course evaluations and post-course focus groups will be discussed. This model could be implemented at any CCRC to promote the protective effects of life-long learning among the oldest old.

Key words: continuing education, life-long learning, engagement, successful aging.
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M. Marx, A. Libin, K. Renaudat, J. Cohen-Mansfield. Barriers encountered in an e-mail tutorial program for computer-illiterate seniors aged 71-96 years. Gerontechnology 2002; 2(1): 151-152. One-on-one email tutorial sessions were provided for 28 elderly novice computer users at the Virtual Communications Community Technology Center. The participants, who had varying levels of cognitive and functional impairment, each received an average of five 45-minute tutorial sessions (range = 1 to 43 sessions). Four major barriers typically reported for seniors were encountered in our group of frail elderly. These barriers were: hardware problems (e.g., difficulty using the keyboard or mouse), software problems (e.g., lack of on-screen instructions), physical limitations of seniors (e.g., decreased vision or motor skills), and cognitive/emotional limitations (e.g., decreased mental status, computer anxiety). Moreover, we discovered a fifth barrier that further complicated the effectiveness of e-mail usage. We call this the barrier of technology mind-set (i.e., how one relates to new technology as well as its inconsistencies). For instance, each computer experience is not always the same as the previous experience: sometimes the server is down; sometimes the computer crashes; sometimes there is new e-mail and sometimes only previously read e-mail. This lack of predictability was particularly unsettling for our participants who have had few life experiences with new technology from which to draw. Participants who were able to overcome the 5 barriers were those who were strongly goal-oriented, and very much wanted to correspond through email with a geographically-distant family member. Funded by Montgomery County Partnership for Community Empowerment Grant #EMP-02FY02.

Key words: e-mail, tutorial program, frail elderly, barriers, technology mind-set, computer experience.
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D. McConatha. Aging, Technology, and Venture Capital: Boom and Bust during the .com Frenzy. Gerontechnology 2002; 2(1): 152. In the summer of 1999 an international group of gerontologists, computer scientists, and venture capitalists set out to create a unique learning environment for adults 60 and over. The principle concept driving this venture was the idea that the Internet could serve as a platform for older adults to teach and learn. A review of the supporting literature is offered. By the fall of 1999 $1,000,000 had been raised to hire a staff of 20. Having achieved the first step of a three phase business plan, the management team sought partners, additional capital and opportunities to field test the beta version of the program. In February of 2000 an additional $10,000,000 in contingency capital was secured and ten national and international partners agreed to cooperate in the third and final stage of the plan. This stage included establishing a co-partnership with a recognized brand organization that could provide in excess of one million users. The team also focused on the financial models needed to insure substantial return on investment for the venture partners. This third phase also required that the theory and research basis be integrated with the financial models and the extant partnerships. The company was unable to accomplish this third phase. An examination of the reasons behind the successes and failures of this venture are discussed and analyzed. Suggestions and perspectives are offered to those seeking venture capital support for technological based products and services targeting the aging population.
Key words: aging, technology, venture capital.
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D. Lansdale, L. Chappelle. Linking Ages in Communal Settings. Gerontechnology 2002; 2(1): 152. This session will highlight LinkingAges, a novel program that enables elders in congregate settings to get in touch with family and friends through e-mail and the Internet. Introduced and facilitated in small group settings, the technology provides a vehicle for elders to get back into their social networks. Participation of students provides a rich and mutually beneficial intergenerational dimension. The program is an affordable and powerful antidote to loneliness, helplessness, boredom, and cognitive decline. This program, through the vehicle of user friendly webtv promotes self-efficacy (built through mastery, modeling, social persuasion, adaptation) the theory (Albert Bandura) that confidence in one's ability to accomplish a task resulting in success, leads to greater confidence.
Key words: societal participation, quality of life, World Wide Web, intergenerational.
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C. Nicolle, M. Dekker, J. Molenbroek. The GENIE Design Workshops and their contribution to curricula for inclusive design. Gerontechnology 2002; 2(1): 152-153. The GENIE (Gerontechnology Education Network In Europe) Thematic Network project was funded by the SOCRATES / ERASMUS Programme of the European Union and ran from 1998 to 2001 (see www.gerontechnology.org/genie/). The network was established to

improve the quality of education in gerontechnology and to promote its acceptance across universities and institutions of higher learning. A key component of the final GENIE meeting in Helsinki, August 2001, consisted of a number of Workshops spanning different age groups and disciplines. The purpose of these workshops was to provide an experimental and learning opportunity, enabling students to work together with older people to identify potential design solutions. The final outcome of the workshops was in the form of an idea for a new product, technology, service, system, or environment matched to the requirements of the older person. Following a general SWOT analysis for older people (SWOT = Strengths/Weaknesses/Opportunities/Threats), five groups were formed covering the themes of Mobility, Work, Technology, Housing, and Communication. Each group consisted of 3 students (representing a range of European countries), 1 senior person, 1 facilitator and 1 tutor. This paper will discuss the methodology used and its practical application, with emphasis on inclusive design principles and the importance of user involvement at all stages of the design process. The results of the Mobility workshop will be presented in detail, describing the specific methods used to identify the older person's needs, problems, and wishes, and how new design solutions would optimise their opportunities or reduce their threats to independent mobility. The paper will conclude with suggestions emerging from the workshop which can contribute to key knowledge and skills for a model curriculum in inclusive design.
Key words: gerontechnology, education, network.
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Technology, Caregiving and Training

K. Nakajima, Y. Sumi, T. Tamura. A Training System of Oral Care Support Equipment for Caregivers. Gerontechnology 2002; 2(1): 154. We have developed an oral care support equipment that consisted of power brush, water supply, and water vacuum to prevent aspiration pneumonia in the elderly. Medical staffs for instance dentist and nurse use this well, but the caregiver who does not have an experience of oral care needs training to use the equipment. To spread widely this equipment to inexperienced caregiver, we developed a training system to acquire skill of oral care easily and quickly. The training system consisted of a mannequin, an electronic balance, and the oral care support equipment. The mannequin anatomically mimics the oral part having a tongue and teeth with a drain tube at pharynx. Water leaks from the drain tube when the caregiver fails to vacuum all of saliva and the washing water. The amount of water leak corresponded to the oral care skill is measured with the electrical balance. Seven volunteers who were inexperienced oral care participated in a training program with ten times trial. Although 50% or more of the total amount of the water supply was leaked in the beginning, about 10% or less were leaked after seventh trial. The training system may be useful for effective oral care in inexperienced caregiver.
Key words: training system, oral care, support system, caregiver, aspiration pneumonia.
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L. Murdoch, J. Kinney, C. Kart, T. Ziemba. Caregiving In Place: The Role of Technology. Gerontechnology 2002; 2(1): 154. Most individuals with dementia 'age in place' through the assistance of family caregivers. This project explored caregivers' attitudes and use of technology in caregiving. Focus group findings indicated key challenges for families include the safety of the individual with dementia, receiving support from distant family and informing them about their relative's condition. We then explored how technology might assist in these endeavors. Despite the limited use by some caregivers of 'low-tech' tools (e.g., door alarms, intercoms), caregivers lacked a comprehensive system to enhance their relative's safety. Caregivers evaluated an Internet-based security system that was inexpensive and could be purchased in local electronics stores. This system allows monitoring within a home through video cameras and other enabled devices, including motion, power, temperature and noise sensors. Caregivers felt the system would allow them to focus on their relationship with the care recipient, and potentially provide opportunities for respite and support from other family members. Caregivers were optimistic about the use of this technology and were cognizant of the trade-offs between safety and dignity, respect, privacy, and desires for independence and autonomy. Caregivers identified advantages and limitations of the system, including barriers to its use. Results suggest that there are affordable technologies that can assist families in their efforts to care for relatives with dementia at home.
Key words: caregiving, aging in place, safety, dementia.
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A. Bialokoz, A. Turner-Smith, A. Tinker, P. Lansley, K. Bright. Using ICF Codes to Match Assistive Technology to Persons and Property. Gerontechnology 2002; 2(1): 154-155. This paper describes how the WHO 'ICF (International Classification of Functioning, Disability and Health)' classification has been adapted as a common language for the

integration of three separate types of assessment across different disciplines. A multi-disciplinary project is investigating the introduction of Assistive Technology (AT) into Older People's Homes in the UK in terms of feasibility, acceptability, costs and outcomes (www.fp.rdg.ac.uk/equal/AT) Three organisations are involved each with their own specialities: social gerontology, construction engineering, and rehabilitation engineering. The assessment of individuals includes bodily function (ICF domains such as locomotion, seeing, reaching and stretching), activities and social context. The assessment of buildings includes layout, construction type, and condition. The assessment of appropriate AT includes the degree and type of disability it addresses, the match with the building, and costs. All descriptive parameters were quantified using the ICF classification or comparable codes. By weighting and combining these codes, three multi-dimensional parameters were created that described the person, the building, and possible AT, and so enabled computation of appropriate matches of AT and housing to an individual. Analysis of a given building generates an indication of cost for adaptations and a score for the suitability for an individual. Typical user profiles enable housing providers to assess possible adaptations of their housing stock to match present and future needs of their tenants. This research has produced a tool based on the ICF classification enabling three separate disciplines to communicate in a common language when working to match people, technology and homes together.

Key words: ICF, multi-disciplinary, common language.

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R. Pieper. The impact of context on gerontechnology: The case of 'virtual nursing homes'. Gerontechnology 2002; 2(1): 155. Gerontechnologies are addressed to different target groups and implemented in different contexts. These contexts - rather than just the needs of the older persons - mediate and determine the use of gerontechnology. Examples of such contexts are housing provision, consumer markets, or the social and health care systems. Also model projects or concepts like the 'virtual nursing home' (VNH) are subject to contexts and as well as constituting more specific contexts for the selection and implementation of gerontechnology. The presentation will propose a 'social shaping' framework for the impact of such contexts, clarify the concept of VNH, describe two VNA model projects supported by Federal and State governments in Bavaria differing in their approach, and demonstrate the impact of these contexts on the use of gerontechnology.

Key words: virtual nursing home, telecare, social aspects.

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