Hsu, Y.-L. [徐業良]. Editorial: Special issue on "Cross-strait research collaboration: responding to aged society". Journal of Gerontechnology and Service Management 2016;4(1):1-4; doi:10.6283/JOCSG.2016.4.1.1 Based on very similar cultural backgrounds, lifestyles and family types, cross-strait research collaboration between scholars from Taiwan and China Mainland is being planned under the theme "Responding to the Aged Society". This special issue invites the principle investigators of the approved research projects to share the abstract and "background and research purpose" of their proposals, intending to provide more understanding and communications between research teams and facilitate further collaborations.

Keywords: aged society, research projects, cross-strait research collaboration

Liang H-F [梁曉帆], Sun T-L [孫天龍]. Design and evaluation of user experience with interactive healthcare games for elderly persons. Journal of Gerontechnology and Service Management 2016;4(1):5-10; doi:10.6283/JOCSG.2016.4.1.5 Aging population is a concern across the Taiwan Strait. Taiwan is an aging society that is projected to become a super aged society by 2025, with 21% of its population 65 years old or older. At the same time, the total aged population will be three hundred million in the Chinese mainland. As a result, products or services for elderly persons will gain in popularity in light of this trend. However, technology-driven but not human-centered design is the common means now used for the development of products and services as well as relevant research on aging issues. Since the elderly usually experience various degrees of cognitive or physiological deterioration, it is important to understand the elderly's diverse needs so that the proposed technology can meet their unique requirements. Therefore, this three-year project aims to design and evaluate the user experiences of elderly persons with interactive healthcare games using a research team across the Taiwan Straits. In the first year of the project, user requirements will be identified and prioritized through surveys, interviews, and observation. The contents of the interactive healthcare games will be designed according to the needs of the elderly persons. In the second year, a prototype of interactive healthcare games will be developed with interactive mechanisms so that usability tests can be conducted to reveal usability problems and to provide possible corresponding solutions. In the last year of the project, design guidelines and a database about interactive healthcare games for elderly persons will be constructed based on the results of the last two years and the analysis and evaluation of user experience for playing the games between the Taiwan Straits. It is anticipated that the guidelines and database can provide useful suggestions for further development and research on localization and personalization for Human-Computer Interaction (HCI) for elderly persons so that the technologies and applications will meet all the user requirements.

Keywords: user experience, aging, interactive game

Lin C-P [林慶波]. Mapping brain connections change across the human lifespan with optimum diffusion and functional MRI. Journal of Gerontechnology and Service Management 2016;4(1):11-20; doi:10.6283/JOCSG.2016.4.1.11 Brain development, maturation and senescence are a complex process linked with widespread change that underlies sophisticated cognitive functions and neuropsychological behaviors including memory, attention, and cognitive control. Growing evidence shows that human brain function is not only modulated by brain topological changes but also operates coherently by large-scale brain organization for specific complex cognitive functions. Anatomical linkage of synapses and associated neurons supplies the basic architecture of brain functions that are of interest to neuroscientists since connectivity patterns define functional networks. To understand the extensive cognitive and behavioral advances in both healthy and disease states, study of brain connectivity from childhood to aging is crucial and necessary. Recent advances in the study of structural and functional brain connectivity inspire new conceptualizations of large-scale brain networks. The dynamic and neuropsychological behaviors have been demonstrated to link the topology of the brain networks, which changes over the lifespan etiology following a specific anatomical sequence. With the aid of novel in-vivo MRI techniques, a thorough knowledge of brain network across the lifespan in living humans sheds light on an integrated understanding of the interplay of structural and functional brain organization and behavior. Based on our previous work and the foreseeable importance of age-related behavior and brain connection associations, the goal of this project is to develop a robust reconstruction algorithm for structural connectivity to build reliable brain connectivity models in living human brains, or human connectomics (neuroconnectomics). Sequentially, the properties of structural and functional

networks will be examined and further integrated to improve the models of functional integration. It will allow us to study brain connections and functional integration across the lifespan in a large-scale brain network. In the last two years, to elucidate a complete view of the functional dynamics and the underlying anatomical connections across the lifespan, behavior-linked functional dynamics and the underlying anatomical connections in the living human brain across childhood-adulthood (3rd year) and adulthood to ageing (4th year) will be studied. In order to achieve this goal, we anticipate to (i) optimize imaging methods in reconstructed brain networks, especially for most of the previous DTI dataset that was already acquired in various global brain enters, and to (ii) construct the topological patterns of large-scale brain networks across the lifespan for the (iii, iv) behavior-linked developing process of brain organization during early adulthood and in older adults, which may be applied to predict the maturing of particular cognitive functions and to predict years until neurodegenerative symptom onset in high-risk subjects. With these efforts, we can reveal the development of brain structural and functional connectivity underlying alterations in cognitive abilities and predict individual brain maturity through the lifespan. At the end of this project, the database will be released for international academic research, under the agreement from Taiwan's Ministry of Science and Technology. This project should prove helpful to further aging/development studies in brain functions and disorders, and inform evidence-based robust clinical interventions.
Keywords: aging, lifespan, brain network, cognitive decline, diffusion MRI, functional MRI

Tuan P-C [段伴虹], Chen T-C [陳聰堅]. Lin C-S [林清壽], Pei C [裴駿], Wang P-C [王佩琴], Sun T-L [孫天龍]. Exploring the Realization Model of Ageing Smart Care System from the Service Provider's Point of View. Journal of Gerontechnology and Service Management 2016;4(1):21-28; doi:10.6283/JOCSG.2016.4.1.21 There is a growing trend to combine ICT technology and health information management systems for the benefit of health care targeted at the elderly. The effectiveness of a smart technology care service system depends not only on the functionality of the system provided, but also on how well the needs of both service providers and users are met in the service delivery process. In this project, research teams from Taiwan's Nan-Kai University and Mainland China's Peking University will work together to research a smart health service system for the elderly. The main goal of both teams is to verify that such a smart system can work well and help elderly people preserve their quality of life. Another objective is to provide theoretical and applied research evidence to support the realization of a long-term elder care policy. We proposed to put the research topics forward to "Enhance the smart technology elder care service system performance from the service provider's perspective". The Mainland China research team will use the user perspective to explore issues related to the realization of a smart elder care system. The project will span three years and will employ Service Experience Engineering (SEE) and Kansei Engineering (KE) methodologies to explore the effectiveness of a smart elder care system in three settings: home, community, and institution. We plan to explore the following: (1) To understand the interactive relation between function and Kansei when the smart service is processed at different age and health portraits; (2) Using the existing smart service system to verify the effectiveness of SEE and KE; (3) Develop the S.O.P. for the smart technology service process. Three typical smart care systems will be tested for effectiveness after reviewing domestic or foreign literature and expert interviews in the first year. An innovative long-term care information management system with i-smart platform will be provided in the third year.
Keywords: kansei engineering, service experience engineering, service process design, smart technology

Wu F [吳帆], An N [安寧],Wu Y-H [吳雅惠]. Development and implementation for elder collaborative and smart community. Journal of Gerontechnology and Service Management 2016;4(1):29-42; doi:10.6283/JOCSG.2016.4.1.29 Every country has an aging population and providing effective and substantive healthcare service to elders has become an urgent and important problem all over the world. Taiwan and mainland China in particular have a sharply increasing proportion of elderly people. This multi-year project will combine the skills and knowledge of experts and professionals in medical informatics and public health from Taiwan and mainland China working in collaboration. It aims to unify Taiwan's IT ability and the elite manpower of mainland China for the benefit of the elderly. The project will focus on scientific problems in the monitoring and alarming of and responding to elders' health status. We will utilize leading-edge technologies like Internet of Things and cloud computing to construct an ambient intelligence. In addition, the project will adopt social

media to help the elders enhance their communication and lessen loneliness. The project scope encompasses the following: (1) Creative service model for elders' healthcare across the strait; (2) Implementation of an elders' health service;(3) Information system infrastructure for elders' health;(4) Development of computing and information model for elders' health;(5) Research of biological and psychological symptoms for elders (e.g., reminiscence therapy, sensing of mobility, timing, and spacing through the Internet of Things);(6) Big Data analysis model for the evaluation of elders' health. This project will mainly utilize healthcare service to prolong the wellness of elders, improve their psychological status, stabilize the ability of elders, and enhance nursing care. The first imperative is to construct a healthcare platform which will technologically support fast response by elders' relatives and caregivers. A layer on top of this platform will incorporate sensors that ubiquitously sense the elder's health status. Equipment that can be connected online will include sensor-embedded mattress, other types of sensors, and a location sensing system, all of which can eliminate or significantly reduce the repetitive tasks now performed by nurses. In the third year, a reminiscence therapy system incorporating video conference capability and social media for engaging relatives and friends will be provided. The system will include a search engine for retrieving old photos and other materials (videos, songs, music, etc.) from an elder's early years. Such photos and other materials can help elders feel more comfortable, especially when they are in an irritable mood or suffer from dementia.
Keywords: long-term care, home care, elder technology, smart mattress

Chang P-L [張博論], Kuo M-C [郭明娟], Tsui Y-Y [崔妍妍]. Integrating comprehensive geriatric assessment in long-term care with mobile health technology to develop an active total participatory smart mobile cloud support model for the aged. Journal of Gerontechnology and Service Management 2016;4(1):43-48; doi:10.6283/JOCSG.2016.4.1.43 How to establish an effective model of caring for the aged has emerged as a significant healthcare issue because of the rapid growth in the elder population. Among many approaches, the Integrated Care model of monitoring the aged starting from acute care through post-acute care, community care and ending with home care has been highly used in advanced countries. The success of this model relies on the use of uniform Comprehensive Geriatric Assessment tools but is often discounted because of limited professional assessors, lack of time and failure to acquire the most updated information on the elderly's health status due to the traditional batch and quarterly assessment modalities. The mobile health model which uses smartphones and wearable devices has become popular and is widely regarded as the future healthcare model. This model could utilize the mobile platform composed of smartphone devices and the internet, service apps, and instant messaging to facilitate real-time and efficient communication and interaction among all stakeholders. This study team with experience in mobile health and health service for the elderly, propose this plan to accomplish the following goals in the next three years: (1) Develop CGA-based apps and intelligent smartphone and communication platforms for the elderly, family, caregivers, service and healthcare professionals; (2) Establish an interchangeable CGA data base; (3) Design modules to segregate the one CGA into many small context-sensitive components for mobile data collection; (4) Establish the guideline components on mobile devices and cloud center; (5) Design the system interfaces based on good usability design principles to make tools easy and satisfying to use; (6) Design an advanced service model to better use the capability of instant messaging; and (7) Accomplish a creative, spontaneous and long-term-care-based mobile cloud service model.
Keywords: integrated care, comprehensive geriatric assessment, mobile health, cloud service

Lin C-S [林清壽], Lin L-H [林麗華]. A study on importance and satisfaction of intergenerational relationship among middle-aged and older people. Journal of Gerontechnology and Service Management 2016;4(1):49-64; doi:10.6283/JOCSG.2016.4.1.49 As time progresses, the current trend of low birth rate and consequent aging society has brought about changes to the family structure, with the behaviors of getting along between generations and among multiple generations becoming different from those of traditional society in the past. Middle-aged and older people who maintain better intergenerational relationship perceive higher life satisfaction. Furthermore, such people can obtain respect and contentment. Therefore, to enable middle-aged and older people to achieve successful aging, the extent to which middle-aged and older people value intergenerational relationship and their satisfaction with intergenerational relationship are worth investigating. In this study, the theory of intergenerational relationship, Importance Performance Analysis, is utilized as the framework to explore middle-aged and older people's importance and satisfaction with

intergenerational relationship and investigate the quadrant placement of all the dimensions of such relationship. A questionnaire survey was conducted in Nantou County, and 385 valid questionnaires were obtained. The questionnaires were analyzed by SPSS 18.0, and the Cartesian coordinate map of IPA was applied to probe into the distribution of the factors used to explore intergenerational relationship. The results show that among three dimensions – Interaction, Instrumental Support, and Emotional Support - seven factors were categorized in the fourth quadrant. This indicates that while middle-aged and older people perceive intergenerational relationship to be highly important, the satisfaction they derive from such relationship is low. Educators and Ministry of Health and Welfare professionals can use the result to plan future policy aimed at strengthening and improving intergenerational relationship.
Keywords: middle-aged and older people, intergenerational relationship, Importance Performance Analysis

Zeng W-T [曾琬婷], Wang L-L [王玲玲]. Elder-friendly mobile website design guidelines. Journal of Gerontechnology and Service Management 2016;4(1):65-82; doi:10.6283/JOCSG.2016.4.1.65 The number of persons aged 60 or over in the world grows by two percent every year. Many elders use smartphones owing to the popularity of the Internet and their number can be expected to increase quickly in the near future. However, most mobile website designers plan their websites for younger mainstream users and do not incorporate ease-of-use elements for older users. This paper aims to provide design guidelines for mobile website designers that take into consideration older users' vision impairment and cognitive ability, both of which decline with age. We gathered the statistics of feature values from 100 well-known foreign senior sites, invited several elders with smartphone usage experience to evaluate the recommended feature values, and finally obtained the design guidelines regarding visual and cognitive features for mobile websites. These guidelines can help designers create more elder-friendly websites.
Keywords: elder, mobile website, visual design, cognitive design

Kuo P-L [郭姵伶], Lin C-Y [林千玉], Chang L-T [張立東], Chu P-H [鄒碧鶴]. A practice model and its efficacy for resistance training in the elderly. Journal of Gerontechnology and Service Management 2016;4(1): 117-128; doi:10.6283/JOCSG.2016.4.1.117 Aging is not just the passage of time, but an accumulation of biological events over time. Resistance training for the elderly is a well-known method of improving muscle mass, strength and bone density, the latter helping to combat osteoporosis. Achieving appropriate levels of function is important to the elderly as it empowers them to carry out most of the daily living skills necessary for independent living. In this study, to create a comprehensive resistance-training program, eight types of air resistance training equipment were used that incorporated six muscle groups, classified into arms, shoulders, chest, back, abdomen, and legs. Items from the "Senior Fitness Test" were employed to assess improvements in the subjects' bodies as a result of the resistance training. In addition, a structured group exercise approach was used to promote motivation of the elderly participants during the resistance-training program. The results showed that structured group exercise dramatically enhanced elderly motivation during the training. The training used a moderate-intensity exercise prescription and lasted for 12 weeks consisting of two days per week able to significantly increase muscle strength. The increase in muscle strength was confirmed using a series of tests, namely the Arm Curl and 30-Second Chair Stand test, the Single-Leg Stand duration time test, the dynamic balance 8-foot Up-and Go test and the alternate aerobic endurance during the 2-Minute Step Test. However, the exercise prescription did not seem to improve upper and lower body flexibility as assessed by the Back Scratch test and the Chair Sit-and-Reach test, respectively. Finally, there was no significant change in bone density over the training period.
Keywords: elderly, resistance training, senior fitness test items

Lin L-W [林麗紋], Chen T-F [陳黛芬]. A study on psychological adaptation and coping strategies of an elderly female caregiver- from the perspectives of an elderly female caregiver who takes care of her spouse in Yunlin County. Journal of Gerontechnology and Service Management 2016;4(1):83-94; doi:10.6283/JOCSG.2016.4.1.83 In Taiwan, it is very common that elderly wives take care of their sick spouses. However, the hardships those elderly caregivers face are often neglected and remain unnoticed. The purpose of the current study is to understand the daily experiences of the elderly caregiver and to explore how they take the challenges in taking care of their ill spouses.

Hopefully, the current study would enable people to recognize and acknowledge the noble acts of those caring women. The study has adopted qualitative method using an in-depth interview of an elderly caregiver over 80 years old in Yunlin County. The significant results obtained from the study are: (1) the primary reason for the interviewee to choose to be a family caregiver is her love and responsibility for her husband, children, and other family members. (2) The caring job influenced the physical health, psychological health, family system, and social condition of the elderly family caregiver. (3) The factors that the elderly family caregiver copes up in this challenging task are mainly external adaption, emotional adaption and recognition adaptation.

Keywords: the elderly, taking care of spouses, psychological adaptation, coping strategies

Chen C-F [陳振甫], Hsu C-Y [陳裕升]. Design research of an assistive device for the elderly based on therapeutic recreation. Journal of Gerontechnology and Service Management 2016;4(1):95-104; doi:10.6283/JOCSG.2016.4.1.95 Aging for the elderly has been widely discussed and is an important research and design issue. To improve quality of life through healthy recreational activity for the elderly, there is a need to explore therapeutic recreation in terms of assistive devices for the elderly. This study conducted field study in an Elder Center along with expert interviews to collect and analyze the elderly's needs as well as their lifestyles. Then design concepts for assistive devices were proposed and evaluated by physical therapists. The design concept of a Music Potato was chosen for further development since it possesses suitable attributes such as music for the elderly. The Music Potato should be able to provide both physical and psychological experiences for the elderly to use conveniently and safely based on therapeutic recreation.

Keywords: aging society, assistive device, therapeutic recreation, ergonomics, universal design

Shih M-J [施孟均], Ho Y-H [何原璜], Hsu H-Y [許芯瑜], Hsu H-N [許笑妮], Hsu W-L [許文俐], Tsai P-L [蔡碧藍].3-in-1 multifunction umbrella cane. Journal of Gerontechnology and Service Management 2016;4(1):105-116; doi:10.6283/JOCSG.2016.4.1.105 Falls are one of the major accident events among the elderly. There are approximately 30~40% of the elderly, aged over 65, who may experience falls every year. Therefore, many of them acquire canes or walking assistance devices. Global climate change has prolonged the length of the rainy season, but traditional umbrellas can be used only as either a cane or an umbrella. Hence, as presently designed its disadvantage is being unable to function as both a cane and an umbrella. In this study, the application requirements were observed and a survey was conducted to understand the wind resistance factors to elucidate a stable center of gravity. The theoretical foundation of the model of an intravenous injection was applied to invent this 3-in-1 multifunctional umbrella cane. The elderly can go out with this 3-in-1 cane, with no concern about changes in weather, so they may be more willing to go out and benefit from walking. In the future, we hope this 3-in-1 cane will be mass produced, so the price of the product will be more acceptable to the public. Using this product can benefit the elderly, so those elderly with decreased muscle power and rigidity of joints can nevertheless still go out safely.

Keywords: elderly, fall, crutch

Yeh-Liang Hsu [徐業良] PhD, editor of the Journal of Gerontechnology and Service Management
E: mehsu@saturn.yzu.edu.tw