

2017

AGE-WELL Annual Conference
Winnipeg, Manitoba



Aging Gracefully across Environments using Technology
to Support Wellness, Engagement, and Long Life

CONFERENCE ABSTRACT BOOKLET

Bereskin & Parr
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Canadian Association
on Gerontology



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Creating More Independence

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1. Activity Recognition with J!NS Glasses

presented by Dillam Jossue Diaz Romero, University of Alberta

Older adults are sometimes limited in their ability to perform activities of daily life, due to physical and/or cognitive challenges. Wearable sensors, producing a continuous record of activity “fingerprints”, can potentially be used for activity profiling and recognition, and can provide important contextual information for caregivers and clinicians to plan suitable actions for providing adaptive care. We demonstrate our method for posture and activity recognition based on accelerometer and ocular electromyography data, collected through the J!NS MEME glasses, an accessory that many seniors are likely to be needing and, therefore are unlikely to forget wearing.

2. Ambient Activity Solutions for Maintaining Well-being and Function in People with Dementia

presented by Andrea Wilkinson, University of Toronto

Two technologies that offer anytime access to meaningful and rewarding interactions for people with dementia will be demonstrated: 1. Ambient Activity Technologies (AAT) integrates personalized profiles (favourite music, movies) with tablets, sensors, and hardware input devices (wheels, switches). Wilkinson (HQP) led an evaluation of AAT in six Ontario homes; 2. The Centivizer – designed and developed by Chignell and his team - is a behaviour management system that rewards targeted activities (playing Whack-a-Mole, slider movement) with various rewards (applause, music, lights). Ambient technologies are poised to revolutionize dementia care by reducing responsive behaviours through providing anytime access to engaging activities.

3. An Accessible Application for Medication Management

presented by Rawad Mcheimech, University of Ottawa

Older adults must manage their medications to live independently. However, lists of medications can be complicated. This creates risks for health issues, hospitalizations, and dangerous side effects. The inability to manage medications is a major cause for placement in nursing homes, which costs the Canadian government over \$300 million. Our project is developing a medication management app with knowledge from older adults, caregivers, stakeholders, and researchers. Our app is unique, because it is (1) Accessible, (2) Respectful of user privacy (3) Supporting communication with different caregivers, and (4) Accommodating users’ needs. Our app can help older adults live independently.

4. An AGE-WELL ‘Sound-Bite’ for Transdisciplinary Working

presented by AGE-WELL CC3 Transdisciplinary Working Team

This Drinks N’ Demos exhibition showcases a new digital resource developed by the CC3 Transdisciplinary Working team. Entitled “Transdisciplinary Game Night”, our 2-minute animation highlights principles of transdisciplinarity such as the importance of stakeholder engagement and its benefits for aging and technology research and development. Made widely available for the network, it’s a great sound-bite for AGE-WELL members to share with stakeholders in training sessions, conference presentations, and community engagement events. This fun-filled video will be played in succession during the Drinks N’ Demos session where the CC3 team will be available to answer any questions.

5. An Online Escape Room Game for Older Adults' Social Connectedness

presented by Amir Doroudian, Simon Fraser University

This is a demonstration of the online escape room game, entitled 'A Tale of Tales', and developed by our SFU Faculty of Education research team in collaboration with the Centre for Digital Media in Vancouver, BC. The game is inspired by face-to-face escape rooms and designed to address older adult players' needs. The game's theme is based on the novel 'Alice in Wonderland.' It is intended as a fun, meaningful, and engaging activity for older adults that provides opportunities for interaction and social connectedness with other older adults as well as younger family members. We adopted a user-centred design process that involved the end-users throughout the game development process in providing their feedback on the game play and various design elements of the game. Further, we refined the game through iterations that involved testing the usability and playability of the game with older adults. Our next steps are to field test the game and make it available online. If successful, we hope to expand the game by adding several more themes.

6. An Online Pain Assessment/Management Training Program for Long-term Care Staff

presented by Natasha Gallant, University of Regina

Pain in long-term care (LTC) is very prevalent but undertreated partly because residents with severe dementia cannot communicate the subjective state of pain due to the cognitive and linguistic impairments that accompany the disease. Effective, clinically useful observational pain assessment methods are available but many LTC staff do not use them due to documented knowledge gaps. Staff of LTC facilities located in rural/remote areas have limited opportunity for continuing education in cutting edge assessment methods. We will demonstrate an interactive web-based platform for providing evidence-based pain assessment training for staff in rural and remote areas.

7. Brain Exercises for Aging with a Healthy Brain

presented by Zahra Moussavi, University of Manitoba

Memory lapses are a common concern among elderly. It is known that age is associated with decreasing memory in particular associative and spatial memory types. At any age, however, it is possible to sharpen and strengthen memory. The purpose of this presentation is to discuss the effect of different brain exercises on associative and spatial memory types in aging populations. We hypothesize that frequent and regular exercise of associative and spatial memory types improves the mental state of the elderly.

8. Braze Mobility

presented by Graham Browning, Braze Mobility

Braze Mobility develops innovative accessibility technology to enhance individuals' mobility and access to the world. Braze Mobility is launching its flagship product (Sentina), a retrofit sensor system for mobility devices that improves navigability and safety. The device uses highly customizable multi-modal feedback to alert its users to the presence of obstacles around them, and can be configured to be suitable for a wide variety of individual user needs. These devices can empower individuals to be more independent, and make that independence safer.

9. Caregiver Needs: Data Development and Dissemination (Huddol)

presented by Andrew Magnaye, University of Alberta & Mark Stolow, Huddol

Huddol is the first cross-disease, cross platform, bilingual social health network recently launched that aims to help caregivers across Canada navigate their complex, diverse and often isolating journeys. The experience on Huddol starts by helping caregivers define their needs. Based on caregivers' input, Huddol builds a custom network of care around the caregiver, linking them to those best equipped to help and also allowing them to create their own networks. Our demonstration walks potential users of Huddol through registration, navigation and preliminary

use of the application from a caregiver's perspective. Findings from an initial literature search on caregiver trajectories and of the everyday realities and challenges faced by caregivers will also be shared. Connecting with fellow AGE-WELL researchers, partners and collaborators will inform our data development plans, and also give the AGE-WELL network a formal introduction to Huddol.

10. Cross-cultural Design : Have you given it some thought?

presented by Mary Ellen Johnson, University of British Columbia

A Vox Pop is an informal interview with members of the public. These are spontaneous interviews that are generally informal and/or unrehearsed. Our Vox Pop will include questions that may help to raise awareness about the cross-cultural transferability of health innovations and to identify the most important guidelines on the cross-cultural transferability according to AGE-WELL network investigators.

11. Demonstration of the DIY-AIDE System

presented by Hubert Ngankam Kenfack, Université de Sherbrooke

The goal of this demonstration is to show how a caregiver or elderly person with little technological knowledge uses the DIY-AIDE system. DIY-AIDE has 3 steps, which are design, installation and operation. These steps are performed using a dashboard or augmented reality. The design allows the user to customize or create a set of activities and actions for the realization of activities of daily living (ADLs). These ADLs represent scenarios of assistance. Each assistance scenario generates list of sensors/actuators necessary to accompany the person in the realization of his ADLs. DIY-AIDE, in a step-by-step process, guides the person in the acquisition, positioning and orientation of the sensors/actuators. The system provides a live view of the physical environment. The information collected includes, among other things, the environment elements and the state of the sensors/actuators involved in the realization of an ADL.

12. Design, Implementation, and Usability of a Web-Based Consumer Guideline for Decision-Making about Locator Technologies: Stakeholder Perspectives

presented by Lili Liu, University of Alberta

An online consumer guideline of commercially available locator technologies was developed to allow vendors to describe their products and consumers to access this information and make purchase decisions. The perspectives of stakeholders on the implementation, design, and usability of the guideline were explored. Stakeholders perceived the consumer guideline to be valuable in helping them decide which technology would be most suitable. The usability of the guidelines was assessed by caregivers of persons with dementia and vendors of locator technologies who thought that the information in the webpage was relevant and useful. Main usability issues were identified. Website will be shown.

13. Digital Storytelling in Models of Indigenous Dementia Care (MInD) Care: Critical steps in Engaging First Nations communities for Community-Based Participatory Action Research

presented by Janet McElhane, Health Sciences North Research Institute

Digital storytelling is a form of digital media production where everyday people share aspects of their life story and aligns with the Indigenous ways of knowing. "Story is a practice in Indigenous cultures that sustains communities, validates experiences and epistemologies, expresses experiences of Indigenous peoples, and nurtures relationships and the sharing of knowledge" (J. Iseke, Indigenous Storytelling as Research, 2013). Our project builds on story as a tool of data collection and knowledge mobilization. Digital and media technologies enable us to preserve the oral tradition and improve the availability of stories of caregivers of persons living with dementia.

14. Engaging Older Adults in the Technology Research and Development Process: OA-INVOLVE Resources for AGE-WELL projects

presented by Izabela Panek, Dalhousie University

OA-INVOLVE has created a number of resources to help guide AGE-WELL researchers to involve older adults in the research and development process. These include two searchable literature databases, a series of easy-to-use practical guides, information-rich animation videos, as well as webinars and reports on surveys and case studies of older adult engagement across the AGE-WELL network. Our Drinks & Demos contribution will showcase these resources, as well as stimulate discussion about key challenges, facilitators, and models of best practice concerning the involvement of older adults as participants, advisors, and co-producers within projects.

15. Frame of Mind: Unstructured Digital Picture Interaction for Documenting Reminiscence

presented by Bennett Axtell, University of Toronto

Smartphones and tablets now allow people to carry all their pictures with them wherever they go, but current options for portable photo viewing are not intended for in-person sharing and reminiscence. Frame of Mind presents a new way to interact with digital pictures on a touchscreen that encourages storytelling through its free-flowing interaction using the metaphor of viewing pictures on a table top. This allows family reminiscence to be lightweight, portable, and more accessible by supporting photo viewing on tablets that can have access to complete picture collections. So Frame of Mind moves towards digital tools that support our current photo viewing and sharing activities.

16. INTOCARE Website: Innovative Technology for Caregivers

presented by Maude Beaudoin, Université Laval & Randa Dalle, University of British Columbia

The INTOCARE project identifies the needs of family caregivers to help improve existing technologies and develop new ones. As part of this project, we completed two sets of interviews. In the first interview we identify needs and in the second interview we discuss potential solutions. To identify potential solutions, we've refined a website where participant personas/vignettes are presented and their needs are identified. People who visit the website are invited to provide potential solutions, which are then discussed during the second interview. We want to get feedback about this website and find people who are interested in contributing.

17. Language Customization Tool to Simplify Health Information

presented by Sho Conte, University of Toronto

There is a wealth of information about health that is available online; however, most of it is written in terms that are not accessible to older adults. In this poster we present the design and case for an interactive tool that allows older adults to understand online health information. This adapts to users' required reading level, by providing on-demand contextual help to the more difficult terms appearing in an online health document. This is in the form of a novel interactive web browser extension, allowing users to iteratively elicit increasingly more detailed additional information about key terms.

18. Mozzaz care PRO

presented by Anar Dilara, Ontario Shores Centre for Mental Health Sciences

In collaboration with a commercial company (Mozzaz Corporation) we have modified an existing platform made for people with behavioral and/or mental health concerns into a prototype self-management tool for people with dementia. The new "Mozzaz care PRO" aims to connect individuals and support caregiving by remotely monitoring and tracking patient progress. We will demo the prototype which we are testing with dyads of people with dementia and caregivers to identify suitable contents and functions (e.g. cognitive exercises activities, scheduling tasks/appointments, communicating with family/friends, finding local services, leisure activities) as

well as barriers and challenges to adoption.

19. NICKEL - Needs Investigation Methods Compatible with End User Limitation

presented by Joash Sujan Samuel Roy, Ryerson University

Older adults and people with disabilities have a diverse set of needs that may require adjustments to standard needs elicitation methods. These methods may have different cognitive, physical and perceptual requirements that make them ineffective for gathering user needs. NICKEL is a tool designed to assist novice designers, developers or researchers who conduct needs elicitation studies with older adults. Studies are conducted to determine needs elicitation methods that are compatible, user involved, and based on the potential participants' human capability limitations. To use this tool the users need to input their potential participant's level of cognitive ability, physical hand dexterity, level of vision and hearing.

20. PARTNERS Guide – Best Practices for Engaging People Living with Dementia in the Design and Development of Technology

presented by Lisa Loiselle, University of Waterloo

To successfully design, develop, and implement new technology, researchers and developers must acquire a comprehensive understanding of end user needs. However, the process of engaging with persons living with dementia meaningfully and respectfully throughout the design, testing and commercialization of the technology is not well documented. The PARTNERS guide outlines best practices for engaging people living with dementia in the design and development of technology meant for their use. It is the result of a developmental evaluation and participatory research project that followed the design and development of a new app called MemorySpax being created by project partners, Emmetros.

21. PRITECH Policy Primer Website

presented by Maggie MacNeil, University of Waterloo & Melissa Koch, University of Waterloo

PRI-TECH developed its Policy Primer Website as an accessible resource to trial with AGE-WELL projects to aid understanding of policy and regulatory considerations during the innovation process. This website brings innovators through a series of questions, which will lead them to different considerations (for research and development; technology assessment and regulation; and adoption/reimbursement considerations). This website demo will provide innovators with an individualized map highlighting key considerations throughout the innovation journey, along with providing useful feedback for the PRI-TECH team on their resource.

22. SimpleFB: A Simpler Facebook for Older Adults

presented by Elisabeth Sulmont, McGill University & Taciana Pontual Falcão, McGill University

SimpleFB is a Google Chrome Extension aiming to make Facebook more usable for older adults by modifying Facebook's interface. The modifications are largely based on previous research on older adults' preferences when using Facebook. Examples of modifications of the interface include removal of advertisements, a new navigation setup, and minimal layout. The prototype was presented to three older adults who gave us mixed but useful feedback which we will discuss with the conference attendees. We propose a demo where attendees can log in to their own Facebook account or use a "dummy" account to try out our extension.

23. SmartCondo™ Viewer

presented by Victor Fernandez, University of Alberta

The SmartCondo™ Viewer is a 3D virtual environment that reflects the architectural layout and furnishings of a home and communicates the analysis of the SmartCondo™ ambient-assisted living platform deployed in this home. The viewer receives updates on new sensor events and activity inferences from the underlying platform and simulates them with one (or more) avatar(s); in effect the viewer replays the activities of the home occupants, as inferred by the underlying

platform. In addition, the viewer can be integrated with video-camera feeds (if available), which can provide a record of the actual activities in the space, for validation of the SmartCondo™ platform. The SmartCondo™ Viewer can be used to review the activity in the home at real time as it happens, or after the fact as a recording. In this later case, the user can pause, play, go forward, or backward, jump to a specific time or event, and run the simulation (and synchronized video-camera feeds) at different speeds. We will demonstrate the tool using a recent data set we collected in the ECHA SmartCondo™

24. Socially Assistive Robots for Improving Quality of Life

presented by Christopher Thompson, University of Toronto; Silas Franco dos Reis Alves, University of Toronto & Goldie Nejat, University of Toronto

Socially assistive robots have been used to aid people in various activities of daily living (ADLs), including exercising, dieting, meal assistance, and recreational activities. Robots can improve the enjoyability of tasks, increase motivation, and provide cognitive and social stimulation. The focus of our research is to develop intelligent robots to assist the elderly to perform ADLs. Please meet our robot Leia. She will demonstrate how she can assist with two ADLs: dressing and exercising. Leia will obtain information regarding the weather, the user's preferences regarding comfort and dress code, and information about their activity plans such as if they will be outside, and if the activity is athletic in nature. In turn, Leia will provide personalized clothing choices. The robot also motivates a user to exercise with it, by asking the user to mimic its movements. It then tracks the person's movements and provides encouragement. Leia displays appropriate emotional behaviour during both interactions to be a better assistant. We welcome you to interact directly with the robot and see for yourself.

25. Solitaire Quiz & TicTac Quiz : Serious Fun for Seniors

presented by Pierre-Olivier Dionne, TELUQ

In this demo, we will present our serious games for seniors: SolitaireQuiz and TicTacQuiz. People will be invited to play games with our tablet or by installing the games on her mobile. It will be possible to play alone, in multiplayer mode, or against our artificial intelligence Well-A. The project's main computer scientist, HQP Pierre-Olivier Dionne, will show the games to the participants, presenting the various elements of the interfaces, how to start a game, and, of course, how to win. A bonus first view of the web environment that transforms seniors into game makers will also be shown.

26. Technology for Injury Prevention in Seniors

presented by Brigitte Potvin, Simon Fraser University & Karam Elabd, Simon Fraser University

Falls are the number one cause of injuries in older adults. Researchers have collected video evidence of the circumstances of real-life falls in long-term care. We have also developed and pilot tested a novel "stick-on" hip protector for acute care. We are conducting a clinical trial in long-term care of the effectiveness compliant flooring to reduce injuries from falls. In this "Drinks and Demo" session, we will have physical samples of hip protectors and compliant flooring, and sample video footage of falls in seniors.

27. Virtual Gym

presented by Victor Fernandez, University of Alberta

Virtual-Gym is a kinect-based system designed to help older adults to exercise at home. Each exercise description can be personalized to consider the individual's physical limitations. The system offers a simple interface and easy to follow instructions, always visible at the centre of the screen. Instructions and guidance are communicated through audio, and text, while, at the same time, the exercise is demonstrated by an avatar. The system observes the user as he exercises, compares his postures and movements with the correct exercise specification, and provides feedback as necessary. Each session can be saved for future replay and examine each movement from multiple perspectives. The system is currently equipped with a variety of balance and stretching exercises, which can be performed in standing or sitting position. Virtual-Gym was

developed by a multidisciplinary team at University of Alberta including Computing Scientists and Occupational Therapists.

Posters

Session I: October 18, 2017, 9:30 – 10:30 AM CST

Session II: October 19, 2017, 9:45 – 10:45 AM CST

1. 'Just Access'? Questions of Equity in Access and Funding for Assistive Technology

presented by Evelyne Durocher, University of Toronto

Assistive technology has great potential to contribute to health, functioning and quality of life. To date, as exemplified in the Canadian context, variations and inequities in access to assistive technology are evident. The development of legislation, policies and programs has not kept up with the increasing use of assistive technology. In this paper, we apply Daniels' (2008) theory of 'Just Health' to argue that equitable access to assistive technology funding and services is necessary for justice. In doing so, we offer theoretical guidance for the development of legislation, policies and programs to guide such access in health and social services.

2. A Novel Framework for the Comprehensive Evaluation of Ambient Assisted Living Systems

presented by Eric Coates, Saint Mary's University & Manjari Murthy, Saint Mary's University

We have built a robust theoretical framework to evaluate the quality and implementation of Ambient Assisted Living Systems in a home care setting for independently-living older adults. Using four established health technology evaluation frameworks as a basis, we identified a set of critical indicators (CIs) that address the key concerns about AALS fit, usability, and end-user perception. We classified and weighted the CIs based on incidence, relevance, and category, and subsequently developed a comprehensive evaluation framework. Finally, we performed a systematic review of all peer-reviewed papers published between 2015 and 2017, in which AALS systems are evaluated. We discuss our novel framework in the context of the methods used for said evaluations.

3. A Portrait of Canadian Caregivers

presented by Maude Beaudoin, Université Laval

More than eight million Canadians provide care to a relative with a chronic health condition. Being a caregiver can have psychological and health consequences. This poster presents data collected as part of a larger study looking at caregivers' needs to alleviate challenging situations, their use of technologies, and their preferences in terms of technological solutions to fill their needs. The purpose of this poster is to present preliminary findings of the Caregiver Assistive Technology Outcomes Measure that was completed by the 59 caregivers recruited. The help provided, their use of technologies, and the most challenging activities, will be described.

4. A Rating Scale for Mental Health Mobile Applications for Older Adults

presented by Peyman Azad Khaneghah, University of Alberta

There are numerous mental health mobile applications (apps) available to the public, yet very few of these apps are designed to take into consideration age-related cognitive, perceptual and sensory changes. We have used stakeholder focus groups and a review of the literature on mobile health usability, to design a new rating scale to help clinicians quickly screen and identify apps that are appropriate for older adults. Subscales identified from the literature and focus groups include ease of use, usefulness, appearance, compatibility, and cost. The scale can help organizations and clinicians to identify and classify appropriate health apps for older adults.

5. A Scoping Review Exploring the Concept of Trust in the Adoption and Use of Intelligent Assistive Technology to Support Older Adults Age in Place

presented by Josephine McMurray, Wilfrid Laurier University

Older adults can benefit significantly from the use of intelligent assistive technology to support activities of daily living. However, they assume more risk as they move from non-intelligent devices, to intelligent devices where responses and outcomes may become less predictable. This relationship relies on older adults' willingness to trust the actions of an autonomous agent (i.e. intelligent assistive technology), whose behaviours they do not directly control. The results of a SSHRC-funded scoping review explore the notion of 'trust' in the adoption or use of intelligent assistive technology by older adults and found the concept fluid, non-stable, and mediated by the technology examined.

6. A Serious-Game Based Cognitive Assessment for Cognitive Screening with Elderly, Emergency Adults

presented by Tiffany Tong, University of Toronto

We have designed a serious game for cognitive screening for use by older adults in emergency care. This game is based on evaluating general executive function and inhibition ability, which has been shown to decline with age. We have demonstrated the test-retest reliability and validity of the tool in screening for delirium onset. Performance on our screening tool is significantly correlated with patient performance on standard cognitive assessments such as the Mini-Mental State Examination, Montreal Cognitive Assessment, and Confusion Assessment Method. Our serious game has also been adapted for use by older, emergency patients at risk for frailty and functional decline. In this work, we have shown that our game-based screening tool can be used by a sample with different abilities. This research demonstrates the adaptability of using our serious game for screening for both cognitive and functional abilities, as an alternative and complementary method to existing non-computerized methods.

7. A Usability Test of an Online Catalogue with Older Adults

presented by Jiamin Dai, McGill University

We seek to find out possible issues preventing older adults from using online library catalogues more actively, focusing on identifying usability problems with the interface. We carried out a usability test involving 4 participants aged 65 or older, using a think-aloud protocol complemented with a questionnaire and semi-structured interview. Although participants managed to successfully complete the search, they encountered a number of difficulties along the way. We find that interventions regarding both online catalogue interface and library service could be implemented to encourage older adults to use online catalogues and to help them search more successfully.

8. Acceptability of Autonomous Cars among Older Adults

presented by Shabnam Haghzare, University of Toronto/Toronto Rehab – UHN

Out-of-home mobility is important to all age groups, though it is arguably the key factor in facilitating the quality of life experienced by older adults. At present, cars play a crucial role in this out-of-home mobility. In the light of the ongoing developments towards highly autonomous cars or vehicles (AVs), the significance of out-of-home transportation in older adults' quality of life and their anticipated initial rejection of autonomous cars, forward planning is essential to ensure that older adults will eventually cope with this technology. Older adults must be involved in the design process of any potential approach that will bridge the gap between older adults and AVs. To do so, we have designed an experiment to measure their acceptability of the technology after being exposed to different scenarios and conditions of autonomous driving in a driving simulator. Their acceptability levels, as well as their driving performances in manual driving scenarios, will shed light on the preferences and expectations of older adults from autonomous cars.

9. Accessible Social Engagement for Older Adults

presented by Elisabeth Sulmont, McGill University

Age-related motor and cognitive impairments, and fast-paced changes in communication tools, can hinder the social engagement of older adults. Our goal is to develop a new generation of assistive devices and accessible technologies that are sensitive to the social environments where they will be used, while leveraging and supporting therein. Projects include a digital pen and paper email system, accessible touchscreen interfaces, a redesign of Facebook, and a usability analysis of an online catalogue for older adults. All projects aim to reduce digital divides across generations and improve connectivity to decrease social isolation of older adults.

10. Activity Recognition with Wearable and Environment Sensors

presented by Dillam Jossue Diaz Romero, University of Alberta

In our most recent Smart-Condo™ study, twenty-six participants were recruited to spend one two-hour shift, either alone or in pairs and to perform a scripted sequence of activities of daily living. We used a number of different types of ambient and wearable sensors, including (1) PIR motion sensors, (2) BLE beacons, and (3) wearable accelerometer and electrooculography sensors, to observe the activities of our participants. In this poster, we describe our analysis and sensor-fusion methods for synthesizing the evidence collected through these sensors to estimate the locations and recognize the activities of the participants at each point in time.

11. Aging-related Technologies: A Multiple Case Study of Innovation Processes

presented by Melissa Koch, University of Waterloo

A multiple case study was conducted of four AGE-WELL technology projects to explore barriers and facilitators related to the innovation journey from development to implementation. For each, data were collected through: interviews with project members and key stakeholders; surveys; ethnographic observations at each project site; and document reviews. Data were analyzed using directed coding, guided by the ADOPT (Accelerating Diffusion of Proven Technologies for Older Adults) framework (Wang et al., 2010). Both barriers and facilitators were identified. Examples included challenges in recruitment of study participants, and facilitation of progress through collaboration among stakeholders (e.g., clinicians, industry, end-users).

12. An Online Assistive Technology Rating System for Caregivers

presented by Muuo Wambua, University of Toronto/Toronto Rehab – UHN

Providing care for someone living with dementia requires a wide variety of products, services, and other resources to support both people in the care partnership. There is a tremendous amount of information available online, however, not knowing what to look for or where to find it can cause potentially helpful information to remain hidden. CARE-RATE is an artificially intelligent, cloud-based system that leverages natural language processing and deep learning to find personalized solutions to dementia caregiving problems. It uses relevant contextual information provided by users through dialogue to perform a search, filter, and rank results of relevant online resources.

13. AMBIENT Technology to Monitor Gait and Balance as a Predictor of Fall Risk

presented by Elham Dolatabadi, Toronto Rehab – UHN

We will be presenting an innovative vision-based approach (AMBIENT) to unobtrusively monitor gait and balance for the eventual goal of dynamic falls-risk assessment in advanced dementia. We will present the AMBIENT set-up, methodology and preliminary results from a feasibility longitudinal study with 20 participants (age: 78.1 ± 7.4 years, female: 31%) in the geriatric psychiatry unit. The system automatically monitors participants' gait as they walk within the view of the sensor during their daily routine and computes the spatiotemporal parameters of gait. We also tracked any fall incidents and use of psychotropic medications. Our goal is now to collect longitudinal data and to use state-of-the-art machine learning techniques to build a multivariate predictive model capable of detecting changes in mobility and falls risk.

14. Barriers and Facilitators of Integrating an Immersive Wheelchair Simulator (MiWe) as a Clinical Tool for Training Powered Wheelchair Driving Skills: Methodological Approach
presented by Amine Choukou, Université Laval

Training using a validated and portable virtual reality platform may address the need to increase the amount, frequency and efficacy of power wheelchair (PWC) skills training. The McGill Immersive Wheelchair simulator (MiWe), which has been already developed and validated for PWC training, is an innovative platform for this purpose. However, integrating MiWe into clinical practice is a challenging process. The goal of this project is to investigate the potential to implement MiWe as a PWC skills training program in a rehab setting. Stakeholder opinions will be collected through four focus groups and an online survey targeting therapists and program directors.

15. Bringing Family Photo Interaction into Speech-Enabled Digital Spaces to Support Older Adults' Reminiscence
presented by Bennett Axtell, University of Toronto

Sharing pictures and stories can help older adults stay socially connected and reduce social isolation. Digital storytelling enables this in new ways, using different types of technologies. While prior research has explored the benefits of storytelling for older adults, little research has investigated better supporting their digital picture interactions and reminiscence. Our Contextual Inquiry into older adults' reminiscence and interactions with family pictures reveal that there is no digital equivalent to current photo-prompted storytelling activities and that structured picture organization tools limit storytelling. We assess our new free-flowing, speech-enabled digital picture storytelling app, and find that supporting reminiscence without limiting structures can prompt longer, more detailed storytelling.

16. Chatting with my Virtual Doctor – a Study of Effectiveness, Usability and Acceptance
presented by Jaisie Sin, University of Toronto

Doctors are excellent sources of healthcare for patients, however they are not always available nor accessible for patients' questions and concerns, especially when it comes to the aging population. Telemedicine is a communication option that enables remote consultation with doctors without any physical barriers. Virtual agents, software interfaces enabled by artificial intelligence, is another promising option, with the added benefit of working around time-related constraints. This research explores the effectiveness, usability and acceptance of virtual agent versions of family doctors as an interface for personalized medicine for senior patients. It provides comparisons of various media-mediated information-communication strategies.

17. Conversational Voice Interfaces to Support Older Adults' Online Social Activities
presented by Christine Murad, University of Toronto

There has recently been an emergence of social online services, such as purchasing and sharing of media and music. Commercial conversational interfaces (e.g. Alexa) have recently been introduced to support these services. However, these are not universally accessible, risking to further digitally marginalize seniors. Nevertheless, there is great potential to increase socialization by improving the interaction with these interfaces. Our goal is to investigate design theories and principles for conversational agents to interface with these services, and to develop an interface that employs these design principles in support of increasing older adults' online participation.

18. Creating “space” for Women Entrepreneurs & Innovators in Regional Innovation Ecosystems - The WEiRED Project
presented by Katherina Kuschel, Wilfrid Laurier University

The generally small size, slower growth, and lower profitability of women's businesses is known as the “female underperformance” hypothesis; innovation is similarly gendered. This has implications for the development of effective, inclusive and accessible regional support for innovative activities and entrepreneurship that support the development of health and age-related

technologies. We present the results of the WEiRED (Women Entrepreneurs, Innovators, and Regional Ecosystem Development) symposium involving 51 researchers, professionals, entrepreneurs and trainees from universities (Canada, Chile, Scotland, Germany, Denmark, U.K. and the U.S.), healthcare providers, industry, government, not-for-profits, community groups and the entrepreneurial community held at Communitech, Ontario, from June 15-17 of this year.

19. Digital Storytelling and Dementia - Edmonton

presented by Lili Liu University of Alberta

Digital storytelling, using media technology including photos, sound, music, and videos to create a story, has been used with people with dementia as an intervention with positive results. The purpose of this research is to explore and understand digital storytelling as experienced by the storytellers - persons with dementia, across three sites in Edmonton, Vancouver, and Toronto. In Edmonton, the workshop facilitator met with seven participants (4 men, 3 women) over 8 sessions, where participants created digital stories with the help of the researcher and caregivers. We discussed the experience of using digital media to create stories, and the final digital stories were shared with loved ones and the public. All participants appreciated the process and emphasized the importance in being involved in developing and shaping the digital stories. The participants were engaged with creating the digital stories, expressing a range of emotions and spending time to think about what stories are meaningful to them.

20. Evaluation of Exploratory Learning Methods to Help Seniors to Better Adopt Mobile Technologies

presented by Sho Conte, University of Toronto

Shortfalls in technical education for seniors and the consequent gaps in their confidence to effectively utilize information technologies remains a significant barrier to entry for older adults seeking to incorporate mobile devices into their lifestyles. Despite positive feedback from seniors who have successfully adopted information technologies, only 18% of adults in the US over 65 own a smartphone, only 27% own tablets or e-readers, and 41% do not go online whatsoever. Building upon pedagogical understandings of learning strategies unique to older adults, we developed a tool to deliver contextually pertinent information upon pressing a tactile, bluetooth enabled button, to assist in the exploratory learning process.

21. Evaluating the Potential Accuracy Limits of an Automated Pain Detection System when Focusing on Profile (as Opposed to Frontal) Views of Faces Expressing Pain

presented by Erin Browne, University of Regina

We are developing an automated system to detect facial expressions of pain in older adults with dementia. Such systems can only be as accurate as human observers, and past research on pain expression has relied on a front facial view. As our system incorporates multiple views, we examined pain judgment accuracy from left vs. front. 61 undergraduates viewed 80 video clips (left and front view of a baseline and pain segment for 20 older adults with/without dementia). Participants distinguished baseline from pain clips, and judged pain more accurately from the left. Results support using multiple views in automated pain detection.

22. Exploring the Feasibility of a Digital Self-Management Program for Older Adults Living with Dementia and their Caregivers

presented by Anar Dilara, Ontario Shores Centre for Mental Health Sciences

This study investigated the feasibility of a commercially-available digital self-management app (MozzazTM) to support older adults with dementia and their caregivers. Six patient-caregiver pairs were trained to use MozzazTM and asked for a three months home-trial. Data were collected in the form of standardized measures plus in-depth interviews, to capture the barriers and challenges as well as participants' expectations of MozzazTM. Interviews revealed a range of functions and features that must be considered when designing mobile apps for older adults with dementia and their caregivers including simplification of the scheduling functions and removal of

unnecessary functions.

23. Exploring XBOX Kinect Gaming Experiences of Older Adults

presented by Julija Jeremic, Simon Fraser University

This research had the aim to investigate the gaming experience of older adults and identify the benefits and obstacles they encounter while playing XBOX Kinect games. A total of ten older adults (an average age of 80) played a number of mini exergames from collections: Kinect Sports, Dr. Kawashima Body and Brain Connection, Yourshape, Kinect Adventures, and Dance Central 3. Five weekly sessions were audio and video recorded, field notes were taken, and interviews conducted after each session and at the end of the study. The findings show that older adults enjoyed most games they played, but preferred ones they were familiar with, such as bowling. Also, they valued the exercise aspect of games because they had to use their cognitive and physical abilities at the same time.

24. Facial Landmark Detection for Pain Expression Recognition in Older Adults

presented by Ahmed Ashraf, University of Toronto/Toronto Rehab – UHN

Older adults living in long-term care (LTC) facilities with advanced dementia are unable to communicate their pain. A key prerequisite for automatic pain expression recognition is the detection of certain reference points on the face, also known as facial landmarks. Traditional landmark detection methods are tuned to young and healthy adults with their images captured in controlled settings. Using video data of older adults captured in realistic settings (LTC), we present a comprehensive comparison of existing landmark detection methods. We show that with some modifications to one off-the-shelf algorithm we can generalize well to the older population.

25. First Nation Elders who Use Wheeled Mobility: An Exploration of Culture and Health

presented by Lindsay Croxall, Queens University

The purpose of this project is to gain an understanding of the importance of cultural participation, and barriers to participation for First Nation Elders who use wheeled mobility (WM) and live on reserves in Canada. Eight themes were extracted from the interviews including: (1) participation in cultural ceremonies, (2) perceptions of the usefulness of the device(s), (3) access to the outdoors, (4) transportation, (5) exterior paths of travel, (6) accessibility at events, (7) stigma, and (8) burden. The findings demonstrate that policy changes are required regarding the allocation of accessibility funding on reserve.

26. Frailty Toolkit: A Sensor-based Solution for Frailty Assessment and Prediction in Home Setting

presented by Chao Bian, University of Toronto

Clinicians currently use clinical frailty scales to assess frailty of older adults. However, the complex scales which always require clinicians to administer and the infrequent clinic visits could delay the detection of frailty and thus miss the early intervention to reverse the progress into frailty. This research proposes a frailty toolkit which is a portable multi-sensor-based tool to autonomously, continuously and unobtrusively assess and predict frailty for older adults in home settings. Machine learning algorithms will be used to classify frailty statuses and predict frailty progress. Finally, this toolkit will enable early detection and intervention of frailty.

27. From Thought Experiment to Product Development: Ethics on the Ground

presented by Katherine Wayne, University of Ottawa

This interactive presentation involves decision-making through consideration of visual scenarios, and discussion exercises. It aims to enrich tools for ethical discussion and problem-solving. Participants (groups of 2-4) complete basic ethical decision-making task, engaging with visually represented thought experiment (trolley problem). Follow up questions elicit views on how ethical issues are identified, and intuitive approaches to ethical challenges. Participants then consider a concrete scenario requiring decision on a course of action (developing home monitoring system). Follow-up questions highlight connections between the two scenarios to enhance confidence and

efficiency in applying an ethical lens in decision-making.

28. Fun is Serious : Development Process of Games for Seniors, from Idea to Marketing Strategies

presented by Pierre-Olivier Dionne, TELUQ

The goal of this project is to create, research, and commercialize digital games to enhance older adults' quality of life. This poster will represent all the steps of the design process of our games. We will present the different stages of ideation and design as well as the different research documents produced. The technical architecture supporting the project will also be illustrated as this is a significant challenge that has been identified (Google Play, App Stores, Facebook, BASS, servers, etc.). Knowledge mobilization and marketing strategies will also be introduced to promote discussions with the public.

29. How Deep is the Digital Divide?

presented by Choong Kim, University of Alberta

Workforce participation of older workers is critical to sustaining economic growth, particularly in a knowledge economy. Although ageist stereotypes about the 'digital divide' between younger and older persons' skills with computers and technology abound, we know little about older workers' current level of skills in information and communication technology (ICT). Using Canadian respondents to the Program for the International Assessment of Adult Competencies survey, we debunked the stereotype. Nearly 1/3 of older workers were well-versed in ICT skills. Being older was not the main reason some Canadian older workers struggled with technology. Rather ICT literacy was more about socio-demographic disparities.

30. Implementation of a Framework of Priorities for Engaging Older Adults and their Caregivers in Health and Aging Innovation Ecosystems

presented by Heather McNeil, Wilfrid Laurier University

Greater involvement of older adults and their caregivers in health and aging innovation can result in new technologies and processes that are more likely to meet their needs and preferences. We explored how this greater involvement could be achieved in Canadian Regional Health Innovation Ecosystems (RHIEs). A three-phase integrated mixed-methods study, ECOTECH, identified clusters of priorities for older adults & their caregivers to support meaningful engagement with RHIEs. Specific targets, goals, and indicators were developed, providing an understanding of how progress toward greater engagement of older adults and caregivers in RHIEs can be measured.

31. Influence of Handhold Orientation on Balance Recovery Reactions Following Unpredictable Perturbations

presented by Konika Nirmalanathan, University of Toronto

Falls and fall-related injuries are a major concern for older adults as they result in high rates of hospitalization, loss of independence and reduced quality of life. Handholds (handrails, grab bars) are inexpensive assistive devices that can aid in mobility and reduce the severity of falls by allowing users to grasp and generate stabilizing forces. However, there is little biomechanical evidence supporting handhold standards which can be detrimental to individuals' safety when they're not effectively developed or installed. Our aim is to understand how orientations (vertical, horizontal) of handholds impact balance recovery by exploring maximum applied forces and centre of mass (COM) variables. Findings will reveal how orientation affects the effectiveness of grasping responses, by investigating the relationship between COM control and applied forces. This will inform guidelines and accessibility standards related to development and safe installations of handholds, limiting the risk of falls and fall-related injuries in older adults.

32. Interaction Safety Issues in a Non-passive Telerobotic Neuro-rehabilitation System

presented by Seyed Farokh Atashzar, University of Western Ontario

This poster describes our work on the design of a novel bilateral telerobotic neuro-rehabilitation system. The objective of the telerehabilitation system is to allow supervision by a human physiotherapist in a force-enabled robotic rehabilitation system. Our focus has been on ensuring safety of patient–telerobot interactions. A new design framework and control environment have been developed to guarantee this stable, transparent patient-telerobot interaction in the presence of the non-passive, nonlinear, behaviour of the therapist and patient while also accommodating communication delays in the case of cloud-based in-home therapy. Several practical considerations are considered to match clinical needs and minimize cost.

33. Knowledge Mobilization Oriented Research on Aging at Home with Dementia

presented by Guang Ying Mo, Ontario Telemedicine Network and Baycrest Health Sciences & Renée Biss, Ontario Telemedicine Network and Baycrest Health Sciences

We are collaborating with two health care organizations hoping to implement technology-based care for people with dementia (PWD) to age at home. Conducting the research piece to inform this a priori knowledge mobilization goal, we aim to investigate (1) the most effective interventions and technologies for PWD living at home, (2) the most pressing needs of PWD and caregivers, and (3) the barriers to high quality care caused by inefficient communication and stigma. We will discuss the research methodology used and lessons learned from collaboratively designing and conducting an umbrella review and a survey for informal and formal caregivers.

34. Learning to Kinect with People with Dementia

presented by Erica Dove, Ontario Shores Centre for Mental Health Sciences

This study explored whether people with dementia could learn to play games presented on motion-based technology (Xbox Kinect). Eleven participants were recruited from a community-based adult day program and invited to play Xbox Kinect bowling two days/week for twelve weeks. Data captured in the form of video-recordings were analyzed using behavioural coding software. Analysis revealed that participants were able to learn to play games on motion-based technology with repeated exposure, which was evident through reduced prompting, increased independent play, and shorter turn length. These findings highlight the abilities of people with dementia and the feasibility of this type of technology.

35. Machine Learning and Factors Affecting Healthy Brain Aging

presented by Greg Christie, Simon Fraser University

Rates of dementia are rising as Canada's population ages. Engagement in various leisure activities may help reduce the incidence and progression of dementia, but the impact of these lifestyle factors is poorly understood. Our project involves analyzing longitudinal health databases to identify and quantify the impact of these activities, towards the development of a personalized health application for healthy aging. Our preliminary findings highlight that typical, linear analysis approaches often fail to identify many important factors in these health databases. Instead, non-linear methods using Machine Learning may offer a more comprehensive view of the factors affecting healthy aging.

36. Modelling Finger Trajectories to Understand Touch Interaction of Older Adults

presented by Afroza Sultana, McGill University

The majority of older adults encounter selection difficulties, while interacting with touchscreen devices (tablets, smartphones). Finger trajectory analysis from touch interaction can help understanding such difficulties. One major obstacle is that commercial touchscreen devices can

capture data when the finger is in contact with the screen, but not when the finger is in the air. This poster presents a novel finger trajectory-modeling tool that can collect finger-interaction data from a motion-capturing device, and integrate them with touchscreen data. This tool can be useful for analyzing interaction data from older adults to improve the accessibility of touchscreen devices.

37. Neurofeedback Assisted Mindfulness Meditation for Older Adults

presented by Simon Cook, University of Toronto

Learning and maintaining a mindfulness meditation practice as an older adult has particular challenges which current practices are not designed to address, and there is evidence for improvements in cognitive function which are relevant for activities of daily living. The engineering of good interventions for technologically assisted meditation practice is an area that is only beginning to be explored, and we argue that it shows promise for these purposes. Building on recent work in brain-computer interfaces we are developing an application to be used with EEG hardware to track the user's brain activity during meditation and give them feedback about their attention. We are currently investigating neural correlates for relevant kinds of attention which are involved in mindfulness meditation, and plan to evaluate the acceptance of our design which uses these neural correlates with older adults in an upcoming study.

38. NICKEL - Needs Investigation Methods Compatible with End User Limitation

presented by Joash Sujun Samuel Roy, University of Ryerson

Older adults and people with disabilities have a diverse set of needs that may require adjustments to standard needs elicitation methods. These methods may have different cognitive, physical and perceptual requirements that make them ineffective for gathering user needs. NICKEL is a tool designed to assist novice designers, developers or researchers who conduct needs elicitation studies with older adults. Studies are conducted to determine needs elicitation methods that are compatible, user involved, and based on the potential participants' human capability limitations. To use this tool the users need to input their potential participant's level of cognitive ability, physical hand dexterity, level of vision and hearing.

39. OA-INVOLVE: Projects' Survey 1 Results

presented by Oriana Vaccarino, University of Guelph

AGE-WELL projects strive to develop solutions to help current and future generations of older adults (OAs) and caregivers live quality lives as they age. OA-INVOLVE conducted an email survey inviting AGE-WELL project leads, cross-cutting teams, and network management office staff to describe aspects of engaging OAs in their work. The survey was emailed to 35 AGE-WELL projects from April-August 2016 (100% response rate). Survey responses suggest that the engagement level of OAs in AGE-WELL projects varies across the network. OAs are involved as participants, advisors, and co-producers (decision makers). They can be involved in multiple roles.

40. Organizing Elderly Therapeutic Adherence and Medication Monitoring in the Healthcare and Homecare Ecosystem

presented by Lise Boudreault, University of Quebec at Montreal

Medication adherence and drug monitoring to improve the functional autonomy and well-being of seniors in their homes or seniors' residences remains an important societal challenge. The intake of medication is far from secure, due to frequent errors, from the loss of medication to elderly's confusion. This could improve, thanks to the capabilities of a multisided platform for medication monitoring practices from health professionals and patient's medication adherence practices. A first step in the research entails the elaboration of a conceptual framework on how a business ecosystem evolves toward a digital health ecosystem.

41. Peer Feedback to Facilitate Writing Development for Mature English Language Learners

presented by Amna Liaqat, University of Toronto

My research explores the theory behind writing development, and applies these findings to a learning web application for older adult English language learners that helps provide meaningful feedback. Providing feedback is a time-consuming task for instructors. Peer review, where other learners critique a learner's writing, is as a way of improving the writing of both the giver and the receiver of feedback. This study looks at how learners respond to feedback provided by their peers. Both attitudes towards peer review among older adult English language learners, as well as any writing improvements from peer review are examined.

42. Privacy and Information Technology Use: The Perspective of Aging Persons with Intellectual and Developmental Disabilities (IDD)

presented by Hajer Chalghoumi, University of Ottawa

Information technologies (IT) offer opportunities for encouraging social inclusion and autonomy for persons with intellectual and developmental disabilities (IDD). However, privacy breaches are a major risk for this population. This study explores their attitudes and behaviours towards privacy when using IT. Six persons with IDD participated in a series of three focus groups. Participants were aware of privacy concerns in everyday life setting but were unable to transfer this awareness to the virtual context of IT use. Our findings highlight that caregivers have significant influence on the participants' attitudes and behaviours towards IT and privacy.

43. Protecting the Privacy of Persons with Cognitive Impairments in the Development of Technologies

presented by Amélie Gauthier-Beauprè, University of Ottawa

Technology developed for persons with cognitive impairments and related policy work tends to focus on their protection to the detriment of the respect of their privacy and autonomy. For example, technology is used to monitor their whereabouts, with often little considerations of the privacy implications of collecting such data. This poster presents a proposal for change based on scientific knowledge and a review of relevant policies. The following steps of the project include an analysis of AGE-WELL members' practices. The overall project aims to disseminate best practices when developing technologies that protect the privacy and the autonomy of persons with cognitive impairments.

44. Providing Urgent Home Medical Diagnostic Services to Older Adults with Complex Care Needs: A System Level Snapshot of Current Challenges and Motivations

presented by Vicky Young, University of Toronto

Older adults with complex care needs often have difficulty accessing medical diagnostic services at home. Many may postpone seeking medical attention and ultimately end-up receiving urgent care in hospital emergency departments. In hospital, additional complications may occur from which they may never recover (infections, falls). This research explores the challenges and motivations to providing home medical diagnostic services to this target cohort group from the health care provider perspective. Thirty four stakeholders working across the home-to-hospital continuum were interviewed. Their input helps examine implementation considerations for supporting medical diagnostic services with primary health care services in the home.

45. Reflections on an Intergenerational Digital Storytelling Program in a First Nations Community in Northern BC

presented by Georgia Betkus, University of Northern British Columbia

The Nak'azdli Whut'en recognize the importance to promote intergenerational relationships through meaningful engagement of Elders in the community. In partnership with the Nak'azdli Health Centre, we adapted a digital storytelling workshop to be used with Elementary school children and Elders in the Nak'azdli and surrounding communities. Elders met and shared their stories with grade 6 and 7 students. The students audio recorded the stories and added music and pictures to make them into digital stories. As this was a pilot, we will discuss how we adapted

the workshop process and will share our learnings for future revisions of this workshop.

46. Self-healing in the DIY-AIDE system: a Bayesian network approach

presented by Hubert Kenfack Ngankam, Université de Sherbrooke

Do-it-Yourself Adaptable Intelligent Domestic Environment (DIY-AIDE) enables older adults to live independently by allowing them or their carer to personalize and install, on their own, an AI-based smart home. One of its critical components is the sensor network. The detection and recovery of faults in a sensor network are indeed very complex tasks not within the reach of standard users. Aiming to develop a relying autonomic system, we implemented a framework for self-healing based on Bayesian networks that can enhance the autonomy and reliability in a DIY-AIDE. We used assistance to nighttime wandering to illustrate resulting self-healing properties of the sensor and actuator network.

47. Smart Devices for Older adults

presented by Ben Kim, University of Waterloo & Olivier Ngyuen, University of Waterloo

We present two independent studies focusing on the well-being of older adults. In the first study, a scoping review of smart devices was conducted to explore their uses for chronic disease management among older adults. A prospective cohort study was conducted to investigate the acceptability of smart devices and revealed they are highly accepted among older adults. In the second study, we focus on the issues of loneliness and social isolation, which are major predictors of poorer health. We investigate the usefulness of conversational agents as virtual companions that can converse to reduce feelings of loneliness and social isolation.

48. Technology Training for Older Adults with Subjective Cognitive Complaints

presented by Hamdi Hussein, University of Toronto

Telerehabilitation has enormous potential for improving access to care. A critical, yet under-discussed component of telerehabilitation is what training and support is required to enable older adults to use internet-based technology to engage in rehabilitation. The purpose of this study is to describe the process and outcomes of administering technology training and supports in the context of a pilot study examining a telerehabilitation program for older adults experiencing subjective cognitive complaints. We used a qualitative descriptive design, analyzing videotapes of treatment sessions. Findings can inform best practice recommendations when engaging older adults with cognitive complaints in telehealth initiatives.

49. The Health Capabilities of Caregivers: A Study of Conversion Factors and the Democratic Process in the Development of an eHealth Tool.

presented by Karine Latulippe, Université Laval

eHealth is developing rapidly and brings with it a promise to reduce social health inequalities (SHIs). Yet, it appears that it also has the potential to increase them. Few empirical studies demonstrate effective solutions to avoid increasing SHI through e-health. However, strategies for the development of an eHealth tool in the reduction of SHI have been highlighted by a systematic review of the literature. The objective of this project is to identify ways to integrate positive conversion factors and to explain how the democratic process (co-design) is realized in the development of an inclusive e-Health tool for caregivers.

50. The Power of Digital Storytelling: Benefits and Opportunities for People with Dementia

presented by Hollis Owens, Simon Fraser University

Our project explored the experiences of digital storytelling as perceived and expressed by persons with dementia. This project included three sites: Edmonton, Vancouver and Toronto. In Vancouver, six participants were recruited from retirement residences, a care facility, and the Alzheimer Society of B.C. We met with participants over 6 to 8 sessions to create digital stories. Data included observational field notes, audio recordings from the sessions, and interviews that were transcribed and analyzed. The process illuminated best practices for digital storytelling for persons with dementia. For our participants, digital storytelling was a meaningful, rewarding and

viable way to share and preserve stories.

51. Touch Screen Applications as a Co-Play Activity for People with Advanced Dementia and their Carers

presented by Arlene Astell, Ontario Shores Centre for Mental Health Sciences

Staff-client co-play may be an avenue for engaging people with advanced dementia using iPad games. Eight clients with dementia and 4 nursing staff took part. Staff co-played with clients on 3 occasions, selecting from a puzzle, a strategic, a creative and a sensory game. We examined engagement and impact of engagement through face- and screen-view videos using Observer™. We qualitatively analyzed themes in post-play interviews to evaluate facilitators and barriers. Touchscreen games through co-play provide opportunities for success and engagement, and were a positive experience for clients with advanced dementia and carers.

52. Towards a Better Understanding of Challenges Involved in Participatory Design with Older Adults

presented by Taciana Pontual, McGill University

The fast adoption of diverse communication tools by society places barriers for older adults' interaction and increases their social isolation. With the aim of prototyping a system to facilitate older adults' communication, we ran nine participatory design (PD) workshops. Results were two-fold: design ideas were generated for a digital pen and paper e-mail system, but we also perceived important methodological challenges of PD with this population. An iterative process of qualitative analysis led to a concept map grouping these challenges into categories, then used as a coding scheme to extract from the data objective recommendations for future studies.

53. Unobtrusive Monitoring of Fluid Intake and Bladder Voiding

presented by Stephanie Bennett, University of Ottawa

The presented research examines the potential for pressure sensitive mats (PSMs) to be used in the detection of nocturia (excessive night-time urination) by monitoring fluid intake/output events from a volunteer. Data were collected while the volunteer laid down on a foam mattress (on top of a PSM), then repeatedly stood and was instructed to (1) do nothing, (2) drink water or (3) void their bladder. Pressure responses from consecutive sessions were compared, resulting in significant bladder and stomach region pressure differences between sessions when drinking or voiding. There was no significant difference between sessions where the subject did nothing.

54. Usability of a Kinect-based System to Improve the Physical and Mental Health of Persons with Dementia

presented by Victor Fernandez, University of Alberta

Exercise is effective at improving overall health of dementia clients however, barriers can limit participation. The study purpose was to evaluate the usability of a home-based kinect system (Virtual Gym). The research protocol included two phases: (1) Piloting usability; and (2) Piloting usability from a distance. Phase one revealed changes were required to the tutorial, avatar, and feedback provided by the system. Phase two demonstrated Virtual Gym could be successfully integrated in a typical day program, can be used without the presence of dedicated Virtual Gym expertise, and persons with mild dementia are best suited for this system.

55. Using Virtual Reality to Treat Health Anxiety: A pilot Study Comparing Physiological Reactions between Younger and Older Adults to Determine its Usefulness

presented by Bruno Gunther, McGill University

Virtual reality (VR) immersion has been shown to be effective in treating phobias, schizophrenia, and eating disorders. However, no study has explored its usefulness in treating elderly health anxiety (prevalence of 10.2%). The physiological responses of seniors collected during a VR

immersion session will determine the exposure therapy's effectiveness. We hypothesized that during a VR session, (H1) participants worried about their health will have more intense physiological responses than non-anxious participants, and (H2) young anxious participants will have more intense physiological reactions compared to anxious elderly. Participants (n = 40) were divided into four groups according to age and anxiety. Preliminary results demonstrate that using VR may be effective in treating health anxiety. VR exposure seems to generate enough physiological responses to be used in cognitive behavioral therapy adapted to the needs of older adults with health anxiety.

56. Videos of Falls in Older Adults in Long Term Care: What We have Learned and Future Plans for Data Sharing and Knowledge Translation

presented by Brigitte Potvin, Simon Fraser University & Karam Elabd, Simon Fraser University

We have collected a unique database of video footage of real-life falls (over 2000 to date) experienced by older adults in long term care homes. The videos provide a previously unavailable depth of information on the circumstances of falls, to drive prevention strategies. Key findings relate to the causes and activities leading to falls, the circumstances of hip fractures and head impacts, and the associations between fall characteristics and clinical status. Future directions include sharing of videos with researchers and stakeholders, and the development of educational tools for medical students, care staff, residents, and families.

57. Walk to Remember: Feasibility of Physical Activity Tracking and Intervention in an Elderly Population

presented by Rebecca Vendittelli, University of Victoria

Despite the established role of an active lifestyle in staving off age-related diseases, and in enhancing well-being, individuals tend to become less active as they age. Previous research has demonstrated simple prompts delivered via telephone or by mail to be an efficient and low budget method to significantly increase exercise behaviours in older adults, outperforming more involved motivational programs. This poster will discuss my proposed doctoral research, which intends to assess the acceptability and usability of activity trackers in a sample of older adults, and to determine the efficacy of a cost-effective, empirically derived, and minimalistic prompt-based mobile PA intervention for older adults. The vision for this study is the eventual incorporation of empirically based interventions for increasing activity amongst older adults, with exercise tracking devices that are suitable for their needs.

58. Wellness Needs for PEI Indigenous Communities: Opportunities for Development of Technology-based Remote Support

presented by Ben Gould, University of Saskatchewan

Although research on Indigenous health and wellness is growing, our understanding of appropriate services is still in its infancy. Challenges in identifying appropriate wellness services and products for Indigenous populations are related to cultural values, traditions, beliefs, and an impactful history of turmoil and oppression. Through embracing a Community-Based Participatory Action approach, we partnered with two PEI communities to explore the communities' expressed wellness needs. This partnership allowed for an analysis of the communities perceived wellness needs in consideration of their context of use. Understanding their unique wellness needs increases the likelihood of developing appropriate and sustainable services.

59. What should be Prioritized for an Internet-based Intervention for Mobility Assistive Technology (AT) Users and Caregivers?

presented by Zineb Alliche, Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain

An Internet-based intervention called MOvIT-PLUS™ was developed to monitor older adults who use assistive technologies (ATs) and offers training tools for their caregivers. Two sources of data were used to identify the features and guide the technology development: features extracted from existing caregiver portals supported by high quality evidence and 30 stakeholder interviews about feature preferences. Using the TRIAGE method, an expert panel prioritized 36 out of 66 features

covering three categories of services: monitoring, remote counseling, and training. Prioritized intervention features were characterized by interactivity, task-specificity, and empowerment to independently manage AT use, with professional support available for more complex challenges.

1. Aging Persons with Cognitive Impairments and Access to Assistive Technology: Where do they stand?

presented by Hajer Chalghoumi, University of Ottawa

Persons with cognitive impairments constitute about a quarter of the aging population in Canada. They include those with dementia, intellectual and developmental disabilities, brain injury, or stroke. They encounter barriers in their daily living and inclusion due to limitations in their abilities to process and recall information, or communicate with others. Persons with cognitive impairments, may also have mobility or sensory limitations and therefore may benefit from the existing assistive technology (AT) to support mobility and sensory function. They may also benefit from information technologies (IT) use because these technologies can support information storage and recall, or communication. IT are sometimes called AT for cognition. In this paper, we present an overview of the AT funding and service provision programs for persons with cognitive impairments in Canada with the aim to inform policy development and identify priority research areas in this field. We collected information about AT funding and service provision programs offered by the federal and provincial government agencies and charity organizations from 14 Canadian jurisdictions. We found that there are few AT programs available for cognitive impairments compared to other impairments. These programs are dedicated to productive activities such as employment, which limit their access to older people who are not focused on these activities. Many of the programs overlap with others to offer the same services or funding for the same devices. Worse, although more and more IT serve as AT for persons with cognitive impairments, they are not considered as assistive devices, but rather as general consumer products that are not funded. With the lack of funding and regulations related to these technologies, the cost of such products can be prohibitive and other additional issues regarding their cognitive accessibility may arise, limiting their efficiency to better enable persons with cognitive disabilities to carry out their everyday activities. In the discussion, we bring justifications to this neglect of AT for cognition in current programs and services in Canada while proposing a way forward in improving their access.

2. Involving Older Adults in Aging and Technology Projects: Key Challenges and Facilitators

presented by Susan Kirkland, Dalhousie University

Recent Canadian government policy has highlighted the value of person-centered involvement in the research and development of assistive technologies (AT), and the role of AT in providing care and support for older people. The underpinning notion is that older people's involvement will help to ensure that products and services produced will be fit for purpose, accessible and effective in improving the health, wellbeing and quality of life of older people. However, involving older people integrally as co-producers in the research process can be challenging, particularly as 1) visualization of new technologies that do not yet exist can be difficult to convey, 2) the theoretical models and frameworks used are often abstract, and 3) meaningful involvement often hinges on being familiar with complex and diverse knowledge bases which requires capacity building for some older adults (OAs). However, OAs bring important, experiential knowledge into technology projects, which is vital to the production of relevant and effective technologies. OA-INVOLVE has captured barriers and facilitators, as well as best practices regarding meaningful involvement of OAs via a scoping review of the relevant literature and an interview study focused on AGE-WELL case studies. We present here practical, temporal, social/interactional and structural barriers alongside solution-based facilitators. We highlight the need to de-bunk 'myths' around older adult involvement. Capacity building and training for both researchers and OAs to interact more positively within technology projects is also needed. Knowledge concerning the identified challenges and facilitators are being developed into support tools for the AGE-WELL network.

3. Maintaining the Autonomy of Older Adults with Subjective Cognitive Decline using Tele-rehabilitation: A Randomized Pilot Study in a Primary Care Setting
presented by Emily Nalder, University of Toronto

Between 25 and 60% of older adults experience subjective cognitive decline, that is, concerns regarding changes in cognition, despite no objective impairment evident in neuropsychological testing, and normal performance in activities of daily living. Real World Strategy training, is an intervention, adapted from the Cognitive Orientation to daily Occupational Performance Approach™, which aims to support individuals to learn and apply strategies to compensate for cognitive decline, and to adopt healthy lifestyle behaviours. Real World Strategy Training has only been provided face-to-face, and the feasibility of delivery, via tele-rehabilitation, and from specific care contexts, needs to be explored. To prepare for a future randomized controlled trial, the objective of this study was to test the feasibility of study procedures (recruitment and data collection methods) for a trial conducted in a primary care setting. Sixteen older adults with subjective cognitive decline (average age 71, SD = 7.85) were randomized in blocks of 8, to a treatment (TX-G) or wait-list control (CON-G) group. Two TX-G (each with 4 people) received seven 90-minute group, and three, 45-minute individual sessions. The intervention was delivered by a trained occupational therapist using Adobe Connect, and included: education, goal setting, learning a problem-solving strategy, and using guided discovery and dynamic performance analysis, to select strategies to improve performance on self-identified goals. At the end of an 8-week waiting period, two CON-G's received the same intervention. Feasibility measures included, recruitment and retention of participants, and changes in performance on self-identified goals, using the Canadian Occupational Performance Measure. Following screening, 40% of individuals contacted were eligible and agreed to participate. Interim data analysis, conducted half-way through data collection, indicated that performance and satisfaction with performance improved by 1.73 and 2.53 for the TX-G, compared to 0.9 and 1.2 in the CON-G, where 2-points reflects a clinically meaningful change. These data suggest that recruitment from within a primary care setting is feasible, and that the tele-rehabilitation intervention, may improve satisfaction with performance of daily activities.

4. Remote Training for Technology Needed to Meet Needs of Rural/Remote Older Canadians
presented by Megan O'Connell, University of Saskatchewan

Training older adults how to use newly developed technology is critical for sustained use. Remote methods of training are required for rural/remote older Canadians, and we detail how training using principles of cognitive rehabilitation, such as errorless learning, can be adapted for remote delivery using videoconferencing. Nevertheless, reliance on videoconferencing for remote training of new technology will not meet the needs of rural/remote older adults. For quality videoconferencing, at least 5Mbps is required, and these speeds are not available in approximately 1.2 million rural households across Canada (CRTC, 2016). In Saskatchewan, 15% of households and 79% (55 out of 70) of First Nations communities have access to bandwidth speeds less than 5Mbps (CRTC, 2016; INAC, 2013). Lack of access to needed infrastructure impacts familiarity with technology platforms that might be used for remote training. We surveyed 84 rural/remote dwelling older adults (M = 71 years old) about their experiences with technology. Of the sample, 81% indicated they communicated daily with other people. Ninety percent of participants reported using the telephone, 68% the Internet, 63% a cellphone, and 7% a videophone "most of the time/always" for communication purposes. Most participants (89%) said technology is "important/very important" for communication purposes. While a significant proportion used technology regularly for communication purposes, some reported no experience with computers (17%) or the Internet (13%). Many mentioned slow, intermittent, or non-high speed Internet, with over half indicating that living in a rural/remote location impacted their use of technology due to reliability and access issues. In terms of training, half had taught themselves to use technology, 73% agreed that given time and training they could learn to use a computer, and 31% said they would like to have a moderate amount of training with computers. It is clear from the survey that many rural/remote older adults use technology, but there is need for more training in its use and remote training methods will have to take into account lack of broadband Internet access and low use of videophones. Remote training protocols might have to be adapted for the telephone to meet the needs of rural/remote older Canadians.

5. Robots for Homecare of Seniors

presented by Goldie Nejat, University of Toronto & Francois Michaud, Université de Sherbrooke

One of the greatest demographic and social transformations facing developed countries is caused by the aging of their populations, increased life expectancy and related challenges. Incidentally, this supports the fast growing use of assistive technologies, such as robots, in providing needed home care to our older adults. In particular, mobile robotic platforms are now commercially available and can provide mobility to sensors, actuators, and interactive devices in real world settings, without having to engineer the environment for their use. In this talk, we discuss how we are developing and integrating the required sensing, acting, and interacting capabilities to have mobile robotic platforms be used to conduct virtual visits for remote consultations or assistance, to provide cognitive assistance for activities of daily living, and to interact meaningfully with people in a socially and economically responsible fashion. Our research involves the integration and improvement of a cloud-based multi-streams video/audio/data telecommunication platform, an artificial audition system, an appearance-based mapping and localization navigation system, verbal and non-verbal interaction modalities (e.g., greeting and pointing gestures, facial expressions, video and text instructions) on directional and omnidirectional mobile robotic platforms. We specifically focus our presentation on two main elements we have been developing, i.e., the capabilities required to make a mobile robot an effective remote telepresence system for home care assistance, from the perspective of the remote operator, the patient, the operating environment and the health monitoring tasks, and the social interaction capabilities to engage and assist users with activities of daily living to promote aging-in-place.

1. Cause and Prevention of Fall-related Hip Fractures in Older Adults
presented by Steve Robinovitch, Simon Fraser University

Over 95% of hip fractures in older adults are caused by falls. Wearable “hip protectors” are designed to cushion the fall and prevent hip fracture. While specific types have been shown to be clinically effective, there are important barriers to user compliance and biomechanical performance of hip protectors that our researchers are working to address. CLINICAL EFFECTIVENESS. We conducted a 12-month, case control study of falls (n=5330 falls in 1033 residents) in 13 Fraser Health long-term care (LTC) homes. The risk for hip fracture was 64% lower when wearing a hip protector (95%CI: 10-86%). DETERMINANTS OF ADHERENCE. Residents were wearing hip protectors at the time of falling in 60% of falls. Reasons for non-adherence included discomfort (71%), cost (68%), appearance (21%), and perceived lack of need (17%). Staff commitment to hip protectors depended on championing and education. BIOMECHANICS OF FALLS CAUSING HIP FRACTURE. We analyzed the circumstances of 23 hip fractures captured on video in two LTC facilities. All cases involved falls from standing height (during walking (48%), standing (48%), or transferring (4%)). In 91% of cases, impact occurred to the fracture side of the pelvis, at the posteriolateral aspect in 65% of cases, lateral in 22%, anteriolateral in 4% and to the buttocks in 9%. In only one case was there evidence of a potential spontaneous fracture (the fall was initiated by limb collapse). HIP PROTECTOR GUIDELINES. Working with Canadian Standards Association and international experts, we developed an Express Document on wearable Hip Protectors (EXP08-17), that provides guidelines for biomechanical testing and labelling of these devices in Canada. STICK-ON HIP PROTECTORS. Working with a Vancouver-based company, we developed a low-cost hip protector that adheres directly to the skin and provides improved protection (based on tests with the SFU hip impact simulator). Clinical trials are planned for the acute care environment. COMPLIANT FLOORING. Our researchers are conducting a randomized control trial (ClinicalTrials.gov NCT01618786; end date Sept 2017) of the effectiveness of compliant flooring in preventing fall-related injuries including hip fracture.

2. From User-friendly to Senior-friendly Digital Technologies: Improving the Practice of UX Design
presented by Cosmin Munteanu, University of Toronto & Taciana Pontual, McGill University

Older adults are using the Internet and mobile technologies in increasingly large numbers. As evidenced by recent R&D and commercial activity, including that conducted under AGE-WELL Workpackage 4, the usability and user experience (UX) of interactive technologies designed for older adults is of significant concern. This is grounded in prior research that has revealed usability as being a key factor for the successful long-term adoption of such beneficial technologies by older adults. However, the tools and methodologies employed in the research and commercial development of Internet and mobile technologies at best follow user-centred principles that are largely the same as those used for any other user group. At worst, some of the current practices of technology development only marginally incorporate UX design approaches (and often only in name). While this is in part due to a lack of industry awareness or knowledge about UX design and development, more often this is in fact due to a widespread lack of adequate tools to support senior-focused design and development. The consequences of this are twofold: a further widening of the digital divide facing older adults, and a barrier toward market adoption that technology development industries face. In this presentation we describe the knowledge tools that we have refined and validated over the course of some of our recent projects designing and developing interactive digital technologies for older adults. We propose a set of updates, methodological tools, and approaches that facilitate the design of technologies that are more usable by older adults and that lead to a better UX for them. In particular, we focus on innovations to Contextual Analysis methods for collecting design requirements and to Participatory Design methods for implementing such requirements in practice. We then discuss how our approaches contribute to the enrichment of knowledge in the practice of technology design. This discussion is grounded both in methodological contributions to geronto-techno-centric research and in the

validation of our innovations through technology and knowledge transfer to our AGE-WELL partners.

3. Reducing Senior's Digital Marginalization through Natural and Social Interactions and Interfaces

presented by Cosmin Munteanu, University of Toronto & David Kaufman, Simon Fraser University

We are witnessing a rapid transformation in how we access information, share knowledge, or participate in society. This is largely facilitated by advancements in mobile and connected technologies, and by new interaction paradigms (touch interfaces, speech-enabled virtual agents, digital assistants, tangible or smart devices). These have helped and empowered us; yet have also marginalized many vulnerable users. For some, such as older adults, even simple tasks (reading a book, understanding a user manual, comprehending a health pamphlet, sending an email, sharing a memory) can be a struggle despite the potential for assistance afforded by smart, portable, and personal interfaces. This is even more evident when lack of technology savviness exposes them to additional cyber safety risks or when available technologies are unusable. Such older adults could benefit from a greater digital participation; yet, the current ecosystem of design paradigms, interfaces, services, and knowledge excludes many from benefiting from current technological advances. Our work in AGE-WELL Workpackage 4.3 has thus been dedicated to researching and developing technological and knowledge products that enable safe access to knowledge, facilitate social sharing of stories and memories, support social connectivity, and reduce digital marginalization across devices, modalities, and abilities. In this presentation we show how the natural, intelligent, social interactions, and user interfaces that we have designed can be useful in improving older adults' interaction with assistive technologies and in reducing their social isolation and digital marginalization. We present several practical cases where our suite of interconnected software applications and accompanying knowledge products have made an impact to seniors' quality of life. These include: dozens of locations where we have conducted ten-week long digital storytelling workshops, mobile applications that use artificial intelligence and spoken interactions to capture life stories, smart devices to enable written inter-generational connections, or smart crowdsourcing for critical knowledge access. We conclude by discussing our work in facilitating the adoption of such technologies by older adults through tools that increase digital literacy, facilitate access in a safe manner, and are socially inclusive.

4. Using Technology as a Bridge to Build Meaningful Relationships between Elders and Youth in a First Nations Community in Northern British Columbia: Results from the Nak'azdli Lha'hutit'en Intergenerational Digital Storytelling Project

presented by Shannon Freeman, University of Northern British Columbia & Carrie Nash, Nak'azdli Health Centre

Lha'hutit'en in the Dakelh language means "we work together, we help one another". This presentation will illustrate how our team co-led by the Nak'azdli Health Centre and the University of Northern British Columbia was able to successfully introduce digital storytelling technology into the Nak'azdli community to build intergenerational relationships and support cultural preservation activities. A priority for the Nak'azdli Whut'en is to support the mental health and wellbeing of Elders through meaningful engagement and improved connection to community. Nak'azdli Elders identified that sharing cultural knowledge and oral traditions was meaningful and were keen to engage with youth to share cultural wisdom for future generations. In spring 2017, a 10-session workshop that involved Elders from Nak'azdli and surrounding First Nations communities in northern BC and all grade 6 and 7 Nak'albun Elementary School students, was conducted. During the workshop, Elders shared their wisdom and knowledge through storytelling. The students recorded stories then added imagery and sounds to capture their understandings and create a digital story. Group events were held to showcase the videos to the community. Digital storytelling involving youth and Elders is a useful way to document oral histories while simultaneously building intergenerational relationships. This workshop supported creation of meaningful relationships between Elders and youth to help preserve cultural identity. It also helped to reduce social isolation and improve the mental health and wellbeing of Elders by facilitating an opportunity for meaningful contribution and to connect to younger generations in the community.

5. Using Technology to Enable a Continuum of Independence in Wheeled Mobility
presented by Bill Miller, University of British Columbia & Emma Smith, University of British Columbia

Powered mobility provides opportunities for independence for individuals who may not have the ability to ambulate or efficiently propel a manual wheelchair. Mobility in a powered wheelchair has previously relied on acquisition of driving skills through clinician-led training, however this relies on the user's ability to successfully complete the training and demonstrate safe and effective driving skills. As individuals age, the ability to learn or maintain these skills may be compromised by memory loss, changes in cognition, sensory, and perceptual processing, and decline in physical capacity. Given the variety of needs of older adults, technology solutions are required which address varying levels of capability. With new technologies, opportunities for supporting driving are emerging. In this session, we will discuss how advances in powered wheelchair technology can promote independent mobility, using technologies being developed by the investigators in Workpackage 3.2. These will follow a continuum of independence, from technology which enables independent driving through enhanced training using shared control teleoperation to technologies which provide intermittent or ongoing support to the user while driving (obstacle avoidance and intelligent powered wheelchairs). Midpoint analysis of a clinical trial to evaluate the feasibility of the use of shared control teleoperation will be shared to illustrate the potential impact of this innovation. This presentation will highlight how these technologies address the specific needs of older adults and the potential use of these technologies for progressive conditions which may impact physical and cognitive capacities over time.

Carechair Solutions Inc.

The motivation behind this project is my aging grandmother and paraplegic aunt, who have limited mobility and assistance. We built a system that reduces the physical activity and occurrences of injuries to users and caregivers when repositioning an individual between a sedentary and supine position, while monitoring potential bedsores incidences. Given the rate at which the aging population is increasing, there are limited resources available to facilitate their needs as current methods are tedious and uncomfortable. Our innovative and patented solution is a standalone system that saves time, money, and space. Our anticipated global impact is to expand the functionality of the wheelchair and increase the independence of its users.

eTreat MD

As Canada's population ages, arthritis incidence is projected to increase, with unmet needs of early diagnosis. eTreatMD's solution is LiveWith Arthritis (LWA; app (<http://www.etreatmd.com/arthritis-app/>) and Web Portal (LWAP; <http://www.etreatmd.com/livewith-arthritis-plus-webportal/>). The app acts as a data collection tool for medical imaging and health tracking. The Web Portal is used to identify flare-ups, observe effects of lifestyle such as diet and activity, and assess treatment effectiveness and adherence. Instead of an X-ray or ultrasound, images can easily be taken using a smartphone, either by a clinician during a consultation or by patients from home. By shifting the diagnosis and management of arthritis away from the clinical setting, LWAP increases independence and quality of life in older adults, and reduces burden on healthcare systems including supportive housing environments and remote users. LWAP represents an important opportunity for economic growth and job creation in the fields of mobile technology, eHealth and the aging sector.

Heel2Toe

Many seniors are unable to sustain healthful walking because of illness induced deconditioning, inattention, or age-related gait abnormalities. Common gait abnormalities include slow, unstable, shuffling pattern that increases the work of walking, fatigue, and risk of falls, hip fracture, and even death. Evidence shows that gait training is effective in improving gait pattern but effects abate with cessation of training. Our team has developed a biofeedback device that provides auditory feedback for each "good" step, in which the heel strikes first. This simple device can reverse the negative cascade originating from poor gait pattern and promote healthful walking.

MyMem

MyMem aims to improve quality of life for the millions of families affected by dementia. Our platform helps people feel connected, preserve stories, and enjoy personalized care wherever they are. MyMem is the first platform to use voice-assistive, artificial intelligence to enable families and caregivers to recall information easily and independently. Trusted individuals can share updates, photos, caregiving information and life stories within their private group account. Our science-based brain games featuring one's own memories will provide people an entirely new, positive experience. Improving quality of life is the guiding principle around which we are building this transformative technology.

Stediwear Inc.

Stediwear Inc. caters to the dexterity needs of hand tremor sufferers. We have developed the Steadiglove, a glove that intelligently stabilizes the wrist joint in Essential Tremor and Parkinson's disease patients using vibration damping technology. This will allow users to go about their daily activities with significantly less negative side effects. Steadiglove is affordable, lightweight, compact and battery-free. Early beta results show 80% amplitude reduction in tremors.

Tikit Care

Shift Health believes patients and their caregivers are people first and the majority of people struggle with healthcare encounters. Our mission is to transform healthcare communication by engaging patients and caregivers as partners in care through patient/caregiver reported data. Our in-depth experience within the healthcare environment and our technical integration capacity allows our clients to implement a suite of accessible, interactive, and informative digital tools to assist providers and support caregivers through personalized navigation. The Tikit Care solution captures useful health information, drives down costs by streamlining care, assesses risks, and improves our patient and caregiver's experience.

Who Sees What

Privacy is a serious concern for all Internet users, but especially for many older adults whose lack of confidence limits their Internet use. We present Who Sees What, the tool that tackles privacy issues important to older adults who are eager to be active online, but are concerned about privacy and what they are sharing. This tool provides insight into who sees the information they are sharing online, as well as why their information is requested. By taking an educational approach, this tool will give older adults knowledge about the effects of their actions online, building confidence, and providing the chance for greater social connectedness and well-being.

1. Do It Yourself: Adaptable Intelligent Domestic Environments

Presented by Sylvain Giroux, Université de Sherbrooke

Informal carers and even elders with cognitive impairments are those with the knowledge to customize smart-home technologies. A “do it yourself” (DIY) approach can leverage this knowledge to build more effective, adaptable intelligent domestic environments (AIDE). DIY-AIDE is a functional kit that assists carers and elders throughout the design, the installation, and the operation of their own customized AI-based smart home to foster independent aging in place. The resultant AIDE is scalable: monitoring and assistance scenarios can be added, modified, or removed at any time. The DIY-AIDE kit provides carers and elders with tools to express their needs, co-build a 2D or 3D model of their home, define new monitoring and assistance scenarios (“I wanted to be informed if my mother leaves the house at night”), customize predefined scenarios (e.g. night wandering, cooking), and simulate how scenarios would perform in their home. Augmented reality helps for 3D home modelling, scenarios building, customization, and simulation. Artificial intelligence (AI) and ontologies are then used to generate a “blueprint” of the AIDE specifying an optimal set of sensors, their locations, and assembly instructions. Using the AIDE blueprint, sensors are then purchased, labeled, and delivered as a DIY package specifically tailored for one’s home. The DIY-AIDE kit provides tools to ease installation, testing, and troubleshooting. Some tools may be as simple and tangible as stickers and jigs to ensure the right sensor is installed at the right room location with the right orientation. Other tools may also be as hi-tech and virtual as augmented reality applications. Once deployed, the customized AIDE assists the elder in her home providing a sense of safety to both the elder and her carers. The AIDE leans on AI-based modules, e.g. for activity recognition and for ensuring autonomic properties like self-healing. Included in the DIY-AIDE kit is a dashboard enabling carers to monitor sensors, actuators, and behaviors, (de)activate scenarios, manage alarms (safe and unsafe behaviors, sensor malfunctions), assess behaviors over short and long periods of time, and ease carer’s coordination. Design and prototyping of the DIY-AIDE kit. The DIY-AIDE kit is the result of a close collaboration between computer science, occupational therapy, neuropsychology, and design. Many parts of the kit were prototyped. Night wandering was used as the main test case. Two studies on the “night wandering scenario” involved a person with Alzheimer disease and her carer. They were done in two real homes for durations of respectively 6 and 8 weeks. Individual interviews with informal carers were also conducted addressing design and functionalities of the DIY-AIDE kit. With respect to technology, we are developing releases for the short-term —relying on off-the-shelf and mature technology. For the midterm, we are relying on smart phones supporting Google Tango that are not available yet in Canada, and for the long-term, we are relying on full-fledged augmented reality provided by Microsoft Hololens. We are aiming at an integrated multiplatform approach: desktops, smart phones, tablets, and smart watches. With respect to commercialization and knowledge transfer, we are reflecting on the design of an ecosystem of services (hardware, software, support), stakeholders (healthcare system, carers, elders), and communities (non-profit organizations, marketplaces and social networks).

2. Journeys to Engagement: An Evaluation of Ambient Activity for People with Dementia

Presented by Andrea Wilkinson, University of Toronto

Many people living with dementia are under-stimulated, socially isolated, and sedentary. This inactive lifestyle contributes to the prevalence of responsive behaviours (e.g., hitting, screaming), which may lead to overmedication and poor quality of life. Ambient Activity Technologies (AAT) has developed a non-pharmaceutical approach to manage responsive behaviors among persons

living with dementia in long-term care (LTC) facilities. The AAT unit is a wall-mounted interactive tool that augments the LTC environment by providing anytime access to activity experiences that are personalized, appropriate and meaningful to residents.

The AAT unit was designed using Montessori principles (i.e., promote self-confidence and independence, focus on the person's functional capacity and interests) to engage, stimulate, and enhance quality of life through integration of tablets, sensors, and hardware input devices (e.g., wheels, levers). The individually tailored activities are physically, cognitively and socially stimulating, and are designed to engage and utilize strengths of existing functioning, past interests and current needs.

As part of Workpackage 6.1, the AGE-WELL funded Interactive Media Laboratory (University of Toronto) is working with Ambient Activity to evaluate the effectiveness of AAT units in improving outcomes in people with dementia, their family, and LTC staff. In this presentation, we will describe the pretest-posttest summative evaluation of AAT units, which is currently underway at six LTC facilities across Ontario, Canada. Data collection will be completed in November 2017.

Initial recruitment included 36 residents, 24 family members, and 78 staff. Preliminary results (pretest vs. posttest¹) demonstrated significant reductions in the frequency of agitated behaviours among residents (two sub-categories: verbally aggressive, physically non-aggressive), decreased paranoid and delusional ideation, and lower aggressiveness (as measured by the Behavioural Pathology in Alzheimer's Disease scale). Furthermore, staff demonstrated decreased frustrated empathy, a reduction in lack of recognition and lower emotional exhaustion after AAT installation. Video analysis results will also be presented, documenting factors such as gender differences in AAT usage, changes in emotional valence, and type of engagement.

Through appropriately designed ambient technologies, we hope to improve the well-being of individuals living with dementia in LTC environments by providing engaging and meaningful activities on a 24x7 basis. For more information - <http://www.ambientactivity.com>.

3. Innovation in an aging world: A multiple case study approach to the development of a regional health innovation ecosystem framework.

Presented by Josephine McMurray, Wilfrid Laurier University

Does it make sense to establish an innovation hub in our city/region? What do we need to start an innovation hub? Who should we collaborate with? What sort of resources do we need? What kind of impact might we have on the community? We will answer these questions and more, in this presentation that will guide the audience on a brief journey from theory to practice; how regional innovation systems theory has evolved over the last decade, and how it is helping to stimulate collaborative activities in cities and regions, to encourage global innovation and entrepreneurship.

The theoretical development of regional innovation systems evolved from literature on regional science, combined with evolutionary economics (Metcalfe, 1995; Nelson & Winter, 1982), the economics of innovation (Dosi, 1988; Kline & Rosenberg, 1986), theories of interactive learning (Lundvall, 1992) and institutional economics (Edquist & Johnson, 1997), and Etzkowitz and Leydesdorff's Triple & Quadruple Helix frameworks (1995, 2012).

Our team has developed a theoretical model that acknowledges the extant literature, but accounts for the peculiarities that distinguish innovation ecosystems in the health and agotech sectors. This work has been informed by a scoping literature review, and semi-structured interviews and focus group discussions (N=94) with stakeholders from government, industry, academia, civic society, innovation brokers and intermediaries, healthcare providers, and older

adults, in four regional health innovation ecosystems in Surrey (Canada), Cambridge (U.K.), Copenhagen (Denmark), and Boston (USA). Interviews were recorded, transcribed, and analysed using NVivo software. Thematic analysis identified emergent themes, and iterative discussions, combined with analysis of supplementary documentation, such as institutional strategic plans and meeting minutes, provided context and an opportunity to triangulate our findings. We add a fifth helix to Etzkowitz and Leydesdorff's model, and an array of factors that may influence the successful development of a regional health innovation ecosystems.

A survey of global regional health innovation entities (N=212), scheduled for the Fall of 2017, to further explore the relationships between factors that influence the successful development of regional health innovation systems, will be described.

4. Saphenous nerve stimulation: Can we develop a non-invasive bladder neuromodulation therapy for elderly patients?

Presented by Paul Yoo, University of Toronto

Overactive bladder (OAB) is a chronic urinary disorder that affects up to 18% of Canadian adults and approximately 30% of persons over 65 years of age. In addition to coping with symptoms such as frequency, urgency, and incontinence, OAB patients also suffer from anxiety, social withdrawal, depression, and falls while urgently seeking the bathroom. Many of the current treatment options can be effective; but long-term efficacy is limited. Drugs are known to cause severe side effects. Spinal nerve stimulation is expensive and involves relatively invasive surgery. And, percutaneous tibial nerve stimulation therapy requires weekly clinic visits that may not necessarily improve symptoms (60% success rate). We are developing a novel therapy for treating OAB that involves electrical stimulation of the saphenous nerve (SAFN). This idea was conceived from a series of preclinical animal studies, in which we showed that electrical stimulation of the SAFN – which is located subcutaneously along the medial aspect of the lower leg – can evoke significant changes in bladder function. We observed significant increases in bladder capacity and also larger time intervals between repeated bladder contractions, both of which persisted even after the stimulation was turned off.

In this presentation, I will share results from our recent studies that are aimed at clinically translating SAFN stimulation in OAB patients. These include a pilot study in which the SAFN of OAB patients was electrically activated by a percutaneous needle electrode; a study in healthy subjects where we characterized the use of transcutaneous electrical nerve stimulation (TENS) for targeting the SAFN, and a third study that is evaluating the feasibility of using TENS to treat OAB. We envision a TENS-based SAFN stimulation therapy could be particularly beneficial and high efficacious in elderly OAB patients.

5. How much care could a robot give if a robot could give care?

Presented by Frank Rudcicz, Toronto Rehab – UHN

As the costs and prevalence of Alzheimer's disease (AD) rise, the need for assistive health technologies becomes more important. Conversational robots can reduce burden on caregiving by aiding in assessment, monitoring, and therapy. We present a pilot study that tested the feasibility and effect of a conversational robot, called Ludwig, in a picture description task with older adults with AD. We report significant effects in language and facial response in these individuals, and observe that interactions with Ludwig were more successful in individuals with less severe cognitive impairment. Here, we report two phases of interaction with older adults with AD, during a tablet-based picture description task. In the first phase, participants interact with a human, who prompts the participant to describe the image, and follows-up appropriately. In the second phase, this human is replaced with Ludwig, which is controlled remotely by a human. Eleven participants (nine female) diagnosed with AD were recruited, and had Mini-Mental State Examination scores ranging from 2 to 19. We perform two analyses on our results – we first

present general quantitative trends in each of the human-human and human-robot sessions, and we then present more qualitative results from three individuals, as use cases. From the collected speech data and their transcripts, we extract lexico-syntactic, semantic, and acoustic features, and find several linguistic differences between people with different levels of cognition. We also find differences in the manners in which of communication breakdown is exhibited, between interaction with a human versus a robotic partner, and between in facial reactions to the robot. This work with Ludwig is a component of a long-term research project aiming to develop a robotic conversational agent capable of engaging older adults with dementia in meaningful conversation. This will allow us to use linguistic and facial data to perform cognitive assessment and aid health-care providers in monitoring the progression of dementia and, subsequently, in the development of treatment plans. It is tightly connected to its parallel project, Catalyst 6.5 in the AGE-WELL network, and to the subsequent commercialization efforts of its startup company, WinterLight Labs.

1. Designing Technology That Cares

presented by Jen Boger, University of Waterloo & Ron Beleno, Caregiver

Our aging population is resulting in a growing number of family (unpaid) carers to provide support, many of whom are older adults themselves. While there is an abundance of technologies for care provision, little consideration has been given to how technologies might provide more holistic support. This talk will disseminate key findings from the “Designing Technology that Cares” workshop, which had 41 attendees, including people from across AGE-WELL (Workpackages 1, 2, 3, 7, and 8, Cross-cutting Activities 1 and 3, and the Network Management Office), non-profit, industry, government, and seven family carers. The workshop engaged this multi-discipline, cross-sector group to explore three themes: (1) How can technologies support the needs of carers as people (including outside the context of providing care)? (2) How can technologies support the relationship between the carer and the care recipient? (3) How can carers become more involved in the process of creating technologies intended to support them? The structure of the workshop positioned the carers as the experts and enabled all participants to truly engage in collaboratively creating innovative knowledge. Thirteen separate activities directly related to mobilizing knowledge generated by the workshop are being pursued, including journal publications, infographics, videos, and a design principles card deck. In addition to highlighting workshop outcomes, the talk will touch on the importance of human-centered design throughout the entire process.

2. Typology of Family Caregiver Needs and Technological Solutions

Presented by Ben Mortenson, University of British Columbia

A variety of technologies can be used to assist family caregivers with care provision and supervision, and to facilitate access of funding, services and education. To reduce caregiver burden and improve their quality of life, an innovative study was conducted to explore the experiences of caregivers to identify caregiving needs, current use of technologies, and potential technological solutions to fill those needs. This study used a mixed-methods approach involving sequential semi-structured interviews with a convenience sample of current and past family caregivers. The first interview investigated caregivers’ needs, current approaches, and gaps in use of technologies; the second interview explored potential new technological solutions. Standardized questionnaires (e.g., assistive technology-related caregiver burden, anxiety and depression scales) were also administered. Qualitative data were analyzed thematically. Fifty-seven family caregivers were interviewed from across Canada. The mean age of the sample was 62 years; the majority (40%) of participants were current spousal caregivers. Participants demonstrated elevated levels of anxiety and depression. Our analyses revealed three main themes: “The complexity of care provision” – described the challenges and intricacy involved in acting as a family caregiver. “Varied care giving outcomes” – highlighted the benefits and detriments associated with caregiving. “Assistive technology as a mixed blessing” - revealed the diverse impact of AT on caregiving. This study identifies gaps between caregiving need and currently available solutions. Understanding the complex needs of family caregivers will facilitate the development of targeted and prioritized new technologies and solutions (e.g., devices, policies and services).

3. Web-based Consumer Guideline for Locator Technologies

Presented by Lili Liu, University of Alberta

Consumer information about dementia-related locator technologies varies between products and vendors. This creates challenges for caregivers and community and health service providers to make sense of this information when seeking an appropriate technology. An online consumer guideline of commercially available locator technologies is needed to allow vendors to describe their products according to consistent features, and consumers to access this information, and make comparisons to inform purchase decisions. (1) To develop a web-based guideline of

features of commercially available locator technologies for carers of persons who have dementia and are at risk of wandering; (2) To examine the ease of use, acceptability, and usability of this guideline to assist in future adoption of the website. Ease of use was examined through a “think aloud” procedure that included 2 vendors and 3 caregivers. Participants were placed in front of a computer where they interacted with the webpage. Vendors added a product on the website and caregivers looked for a product. Verbal responses were recorded and transcribed. Acceptability and usability were evaluated by inviting 20-40 caregivers who visit the website to go to a link that contained an 8-item online 5 point Likert scale survey. The final version of the guideline uses standard categories of descriptors populated by vendors and include cost, functionality, and usability. The analysis of the think aloud protocol revealed that the information in the webpage was relevant and useful for caregivers and vendors. Results from the survey indicated that the information from the website was easy to understand and useful. Caregivers were likely to recommend the webpage to a friend or relative (Median=4), however, the webpage did not fully meet the caregivers’ expectations about the information they wanted to find (Median=3.5). Suggestions provided by the participants such as increased font size, improved navigation of the product comparison page, and including a feature that allows users to give feedback to other users and vendors, will be applied to the existing version of the consumer guideline to increase the usability and acceptability of the webpage.

4. What have we learned about the Clinical Assessment of Pain in Dementia while Working toward Technology Development?

Presented by Thomas Hadjistavropoulos, University of Regina

Through development work toward a computerised vision system to monitor pain behaviour in dementia, we collected clinical data: videos and information about older adults displaying pain behaviour. The videos were coded frame-by-frame for instances of pain behaviour. The richness of the clinical data revealed new and important information about pain assessment in dementia. We have been able to answer clinically relevant questions such as: (1) “Do different angles of observation affect behavioural assessment?” and (2) “Do time consuming fine-grained behavioural pain assessment approaches have a clinical advantage over quick clinical checklists?” Evidence-based, sometimes surprising, answers to such questions will be presented.

5. Insights from citizens and stakeholders about enhancing equitable access to assistive technologies for older adults in Canada.

presented by Rosalie Wang, University of Toronto

The need for assistive technologies (AT) in Canada is increasing, but access is inconsistent and fragmented across the country which can result in unmet needs. Our aim was to identify citizens’ values and preferences about how to enhance equitable access to AT for older adults in Canada and to engage policymakers, stakeholders, and researchers in deliberations to spark action for addressing this issue. In spring 2017 we convened three citizen panels in Alberta, Ontario, and New Brunswick, and a national stakeholder dialogue with Canadian policymakers, stakeholders, and researchers. We aimed to recruit a diverse group of 14-16 citizens for the panels through AskingCanadiansTM. Panel participants were sent a citizen brief that outlined data and evidence about the issue, three elements of a potentially comprehensive approach to address it and implementation considerations. Key findings from the panels were included in an evidence brief (a more detailed version of the citizen brief) that was sent to participants in the stakeholder dialogue. Thirty-seven citizens participated in the panels who were ethnoculturally, socioeconomically, and geographically diverse, and had experiences with a variety of AT programs. Participants emphasized the need for access to reliable information about programs, equitable access to AT (particularly those supporting basic needs) regardless of ability to pay, and the need for collaboration to support consistency across Canada. The stakeholder dialogue convened 23 participants (including six federal and provincial policymakers) who focused on the need for a guiding framework that supports fundamental change across the country. Examples of guiding principles for a framework include being client driven (including simplifying policies and programs), developing agreement on a bill of rights for those with disability, ensuring universal access to AT that support basic activities of daily living, fostering innovation (for both AT and policy) and fostering national leadership in this area. Our findings point to a need to foster buy-in from policymakers, stakeholders and researchers across the country for such a policy framework to work towards long-term goals such as simplified policy and regulations.

Crosscutting Activities (CC) Alley

CC1: Knowledge Mobilization

Led by: Amanda Grenier, McMaster University; Karen Kobayashi, University of Victoria; Lynn McDonald, University of Toronto

The objective of CC1 is to foster a vibrant culture of knowledge mobilization that is in alignment with the visions of AGE-WELL and the Network of Centres of Excellence (NCE).

Through our commitment to transdisciplinary research, high quality training, and commercialization, we contribute to building a community-engaged space of learning and exchange on knowledge mobilization, that is inclusive and open to all knowledge users.

Our vision is to facilitate the mobilization of notable research and expertise and its translation into social and economic benefits. Building on a plurality of approaches to knowledge mobilization, CC1 supports socially responsible research and development that improves the well-being of older adults.

CC1 approaches this task in close partnership with other stakeholders through conducting innovative research on knowledge mobilization, engaging in policy development, and contributing to training with regards to knowledge mobilization in the expanding field of aging and technology.

Together, we create a knowledge mobilization infrastructure that is effective in directing the flow of knowledge for social, economic, and intellectual impact, and in bridging the gap between new technological discoveries and real-world solutions for older adults, their families, and aging societies.

CC2: Commercialization and Technology Transfer

Led by: Ryan D'Arcy, Simon Fraser University & Geoff Fernie, Toronto Rehab – UHN

A diverse range of organizational mechanisms for enabling innovation exist, including incubators, accelerators, hubs, labs, clusters and ecosystems. CC2's poster focuses on one such form, innovation hubs, which have begun to be investigated in the last decade, and contrasts it with the highly similar organizational form of the innovation lab. Positioning hubs and labs in the innovation landscape, the poster summarizes extant literature on innovation hubs, identifies key characteristics of innovation hubs and labs, and discusses some of the controversies around these organizational forms. The review concludes by providing a list of questions to help guide AGE-WELL as it seeks to determine the appropriate organizational form for its network.

CC3: Transdisciplinary Working

Led by: Pia Kontos, Toronto Rehab – UHN & Judith Sixsmith, The University of Dundee

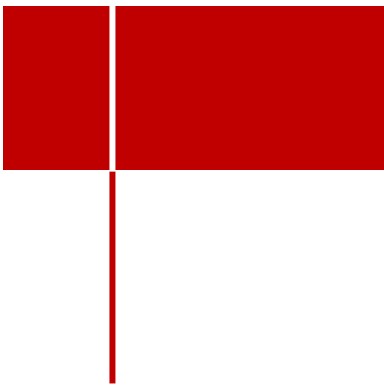
Transdisciplinary working is an approach to research that involves scientists from diverse academic disciplines and experiential stakeholders as researchers or partners to solve complex social problems by developing innovations and knowledge that have real-world impact. This session provides an opportunity for network members to learn more about AGE-WELL's Crosscutting Activity (CC3) on Transdisciplinary Working and the various types of resources available for members. The CC3 team will be available to answer any questions about transdisciplinary working and the resources (e.g. informative video, application in practice tools, scoping review) they developed to support the process.

CC4: Training and Mentorship

Led by: Susan Jaglal, University of Toronto

The CC4 research team is currently focusing on the evaluation and enrichment of 'core competencies' for

highly qualified personnel (HQP) as they progress through AGE-WELL's EPIC (Early Careers ,Inspired Professionals) training program. 'Competencies' are defined as skills and knowledge that can be taught or learned, and which guide trainees' curricula. We conducted a literature review, explored 'gray literature' for relevant competency frameworks, and conducted key informant interviews with AGE-WELL members. Challenges include identifying a 'core' that applies to the many and varied disciplines that comprise AGE-WELL, and then considering possible formats for and content of 'core competencies'.



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