

2016

AGE-WELL Annual Conference
Montréal, Quebec



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

PROGRAM & ABSTRACT BOOKLET

Alzheimer Society

Canadian Association on Gerontology / Association canadienne de gérontologie

gilbrea centre
for Studies in Aging

MEDTEQ
L'INNOVATION POUR LA SANTÉ
INNOVATION FOR HEALTH

ONTARIO BRAIN INSTITUTE / INSTITUT ONTARIEN DU CERVEAU

revera

Toronto Rehab Foundation UHN

UBER

VHA Home HealthCare
Creating More Independence

Table of Contents

Program	2
Keynote	5
Minute Madness (Session 1)	6
Research Plenary (Session 1)	11
Research Plenary (Session 2)	13
Minute Madness (Session 2)	14
Research Plenary (Session 3)	19
Catalyst Grant Projects	20
Posters	21
Crosscutting Activities	33
Demos	35

AGE-WELL 2016 ANNUAL CONFERENCE – PROGRAM OF EVENTS

Hotel Bonaventure, 900 Rue de la Gauchetière O, Montréal

MONDAY, OCTOBER 17, 2016

PRE-CONFERENCE MEETINGS

8:30 – 16:00 **AGE-WELL Innovation Workshop** (*by pre-registration*) **LaSalle**

TUESDAY, OCTOBER 18, 2016

PRE-CONFERENCE MEETINGS

12:00 – 16:00 **Research Management Committee (RMC)** (*by invitation*) **Jacques Cartier**

12:30 – 16:30 **Catalyst Program Workshop: Innovation for carer-friendly workplaces: Good business sense, not corporate philanthropy** (*by invitation*) **St. Pierre**

15:00 – 17:00 **CONFERENCE REGISTRATION OPENS** **Foyer Outrement**

15:30 – 16:30 **AGE-WELL HQP Orientation Session** (*pre-registration required*)
Hosted by AGE-WELL CC4: TRAIN **Salon Bonaventure**

17:00 – 18:30 **Innovators of Tomorrow Workshop** (*pre-registration required*) **Salon Bonaventure**

19:00 – 21:00 **HQP Elevator Pitch Social** (*pre-registration required*)
Hosted by the HQP Advisory Committee **Salon Bonaventure**

21:00 – 23:00 **HQP Networking Social**
Les 3 Brasseurs, 732 Rue Sainte-Catherine

WEDNESDAY, OCTOBER 19, 2016

Main Conference Room - Outrement

7:30 – 9:00 **LIGHT BREAKFAST** **Ville-Marie**

7:30 – 17:00 **CONFERENCE REGISTRATION OPEN** **Foyer Outrement**

2016 Conference Welcome And Opening Remarks

9:00 – 9:10

- **Alex Mihailidis**, PhD, PEng | Scientific Director, AGE-WELL NCE Inc.
- **Andrew Sixsmith**, PhD | Scientific Director, AGE-WELL NCE Inc.

Keynote Speaker

9:10 – 9:55 **The 21st Century Care Agenda. Innovation, Technology and the Built Infrastructure**
James Barlow, PhD | Professor of Technology and Innovation Management (Healthcare), Imperial College Business School, UK

9:55 – 10:05 **20/20 in 2020: Looking ahead to AGE-WELL's renewal**
Andrew Sixsmith, PhD | Scientific Director, AGE-WELL NCE Inc.

Minute Madness – Session 1

10:05 – 11:00 *WP1: NEEDS-OA, WP2: NEEDS-CG, WP3: TECH-FAI, WP4: TECH-APS, HQP Awardees*
Moderator: **Jesse Hoey**, PhD | Associate Professor, University of Waterloo | WP3.3 Project Lead

11:00 – 11:30 **NETWORKING BREAK / POSTER VIEWING** **Ville-Marie**
Sponsored by Ontario Brain Institute

11:30 – 12:30 **Panel Discussion: Innovating policy to support the integration of technology for seniors in the health care system**

- Steven Hart, Assistant Deputy Minister (Seniors and Long Term Care), New Brunswick

- Shelagh Maloney, Vice President, Consumer Health, Communications and Evaluation Services, Canada Health Infoway

Moderator: **Don Juzwishin**, PhD | Director Health Technology Assessment & Innovation, Research, Innovation and Analytics, Alberta Health Services; | WP7 Co-Lead

12:30 – 2:00 **LUNCH / POSTER VIEWING** *Ville-Marie*
Sponsored by MEDTEQ

1:30 – 14:00 **AGE-WELL Annual General Meeting** *Outrement*

Research Plenary – Session 1

- WP3: Technology for Supporting Functional Autonomy and Independence (TECH-FAI)
- WP4: Technology for Active Participation in Society (TECH-APS)
- WP5: Technology for the Prevention of Disease and Disability (TECH-DD)
- WP6: Technology for Maintaining Good Cognitive and Mental Health (TECH-MCH)

14:00 – 15:40

Moderator: **Bill Miller**, PhD | Professor, University of British Columbia | WP3 Co-Lead

15:40 – 16:00 **REFRESHMENT BREAK** *Foyer Outrement*

Research Plenary – Session 2

- WP7: Health Systems, Practice, Policy and Regulatory Issues (POLICY-TECH)
- WP8: Ethical, Cultural and Social Aspects of Technology (ETHICS-TECH)

16:00 – 17:00

Moderator: **Josephine McMurray**, PhD | Assistant Professor, Wilfrid Laurier University | WP7.2 Project Lead

17:00 – 18:00 **HQP Mentorship Sessions** (*by pre-registration*) *Outrement*
Sponsored by Gilbrea Centre for Studies in Aging

18:30 – 20:30 **AGE-WELL “Drinks and Demos” Networking Reception** *Ville-Marie*
Sponsored by Revera
Hosted by the AGE-WELL Board of Directors

THURSDAY, OCTOBER 20, 2016 *Main Conference Room - Outrement*

7:30-9:00 **LIGHT BREAKFAST** *Ville-Marie*

7:30 – 12:00 **CONFERENCE REGISTRATION OPEN** *Foyer Outrement*

Opening Remarks

- **Mike Harcourt** | Chair, Board of Directors, AGE-WELL NCE Inc.
- **Bridgette Murphy** | Managing Director, AGE-WELL NCE Inc.

9:00

Minute Madness – Session 2

9:00 – 9:45 *WP5: TECH-DD, WP6: TECH-MCH, WP7: POLICY-TECH, WP8: ETHICS-TECH, HQP Awardees*

Moderator: **Thomas Hadjistavropoulos**, PhD | Research Chair in Aging and Health and Professor, University of Regina, WP6.3 Project Lead

Pitch Presentations

- 2016 AGE-WELL Pitch Competition Finalists: Winterlight Labs, Automated Pain Assessment and Monitoring in Dementia
- HQP Summer Institute Teams: rLIFE, DELTA, TRIUMPH

9:45 – 10:15

Moderator: **Rich McAloney**, PhD | Director, Technology Management & Entrepreneurship, Impact Centre, University of Toronto

10:15 – 10:40 **NETWORKING BREAK /POSTER VIEWING** *Ville-Marie*
Sponsored by MEDTEQ

Research Plenary – Session 3

- WP1: Understanding the Needs of Older Adults (NEEDS-OA)
- WP2: Understanding the Needs of Caregivers (NEEDS-CG)

10:45 – 11:45

Moderator: **Arlene Astell**, PhD | Research Chair in Community Management of Dementia, Ontario Shores Centre for Mental Health Sciences | WP1 Co-Lead

11:45 – 12:30	<p>Catalyst Grant Projects: Older Adults, Caregivers and the Workplace</p> <ul style="list-style-type: none"> Connecting Working Caregivers Supporting our Aging Workforce <p>Special Guest: Ian Peters, Chair, Employers for Carers Director of Customer Facing Strategy at Centrica</p> <p><u>Moderator:</u> Janet Fast, PhD Professor, University of Alberta WP2 Co-Lead</p>	
12:30 – 14:00	<p>LUNCH / POSTER VIEWING</p> <p>Sponsored by Alzheimer Society of Canada</p>	Ville-Marie
13:00 – 14:00	<p>Technology & Health Entrepreneurship Panel</p> <p>Sponsored by the Canadian Association on Gerontology Student Connection-Connexion Étudiante</p>	Fontaine H
12:30 – 14:00	<p>International Scientific Advisory Committee (ISAC) (by invitation)</p>	St. Pierre
14:00 – 15:00	<p>Panel Discussion: <i>Innovating Intellectual Property Policy</i></p> <ul style="list-style-type: none"> Scott Inwood, Director of Commercialization, University of Waterloo Joanna Preston, Associate Director, Technology Management, Health Sciences TEC Edmonton Mike Walker, Assistant Director, Business Development, University of Ottawa <p><u>Moderator:</u> John Reid, PhD Director, Technology Development and Commercialization, UHN Chair AGE-WELL Commercialization and Technology Development Committee</p>	
15:00 – 15:55	<p>Panel Discussion: <i>The Future of the Field</i></p> <ul style="list-style-type: none"> Julie Foley, Health Care Executive/Caregiver Tricia Jose, AGE-WELL HQP, Toronto Rehab Institute – University Health Network Andrew Sixsmith, Scientific Director, AGE-WELL NCE Inc. Pooja Viswanathan, CEO Braze Mobility Inc. <p><u>Moderator:</u> Alex Mihailidis, PhD PEng Scientific Director, AGE-WELL NCE Inc.</p>	
15:55 – 16:00	<p>Closing Remarks and Adjournment</p>	
16:00 – 18:30	<p>Uncovering Gaps in Technology Use: A World Café Event <i>(by invitation)</i></p>	Jacques Cartier
16:30 – 18:00	<p>Community Advisory Committee / Industry Advisory Committee Joint Meeting <i>(by invitation)</i></p>	St. Pierre
19:00 – 20:30	<p>Board of Directors Dinner <i>(by invitation)</i></p>	Queue de Cheval
<p>FRIDAY, OCTOBER 21, 2016</p>		
<p>POST-CONFERENCE MEETINGS</p>		
8:30 – 3:30	<p>Board of Directors Meeting <i>(by invitation)</i></p>	St. Pierre

Keynote Speaker



Dr. James Barlow, PhD | Professor of Technology and Innovation Management (Healthcare), Imperial College Business School, UK

The 21st century care agenda. Innovation, technology and the built infrastructure

The world's healthcare systems are facing unprecedented challenges – a perfect storm of escalating demand, a drive to contain public expenditure, and the need to deliver greater access to affordable care in poorer countries. Scientific and technological innovation has transformed healthcare over the last century. But the pharmaceutical and medical technology industries are struggling with a slowdown in their pace of innovation and the time taken for new ideas of be adopted into everyday practice remains long. Moreover, there are signs that developing countries are replicating expensive outdated healthcare models from the last century. How should we view the changing relationship between healthcare technology, infrastructure and services, and how can business be mobilised to create appropriate technologies and business model innovations?

Engaging People Living with Dementia in Product Design, Testing, and Commercialization – A Case Study towards Developing Practice Standards

Presented by Natalie Owl, University of Regina & First Nations University of Canada

Understanding user needs is fundamental to developing useful and sustainable technology. RRITE - Rural/Remote Indigenous Technology needs Exploration – explores unmet needs of older adults who are vulnerable due to restricted access to local supports and services, including culturally safe services. We have four data collection sites, one of which focuses on the needs of rural/remote seniors – we have data on unmet needs of rural/remote seniors that provide opportunities for technology development. Three data collection sites use Indigenous community-based research methods with different First Nations communities across Canada, which are located in southern SK, in northern ON, and in PEI.

Developing a toolkit to assist designers in selecting User Centered Design methods for assessing needs of older adults

Presented by Joash Sujan, Ryerson University

Requirements elicitation is the process of discovering the requirements through consultation with stakeholders, from system documents, domain knowledge, and market studies (Sommerville and Sawyer, 1997, p. 11). Measuring and fulfilling requirements of older adults in the development of assistive devices can result in successful products, reduce product recalls and avoid frequent design modifications (Martin et al., 2006). Despite the increasing population of older adults designers, organizations or researchers tend to focus on younger adult audiences in the design process. In addition, most needs or requirements gathering methods have been developed using a similarly focused user population. Older adults may have a varying and diverse set of needs that are different from younger users and they may also have different cognitive, physical, social/cultural and perceptual abilities that affect the expression and measurement of those needs. As a result older adults have generally been excluded from the development process, particularly of assistive technologies, or are being consulted at the end of the design process (Peterson, 2013). Although the traditional requirements elicitation process takes factors such as problem statement, project domain and final customers (Hickey & Davis, 2002) into consideration, the inclusion of human capability demands from the participants to accommodate them in the needs gathering process is often overlooked. To address this issue a new toolkit will be constructed and evaluated with goal of providing a more inclusive and user-centered needs elicitation process for designers.

How Research And Development Projects Engage Older Adults: Older Adults' Active Involvement in Aging and Technology Research and Development (OA-INVOLVE) Project

Presented by Izbela Panek, Dalhousie University

OA-INVOLVE focuses on participatory methods for engaging older adults in technology research and development. We aim to establish best practices for involving older adults in the research process. We partner with community-based organizations, AGE-WELL projects, and seniors to assess how older adults are currently involved in research, their level of engagement along the spectrum from research participant to advisor to decision maker, as well as their experiences, and outcomes achieved. This, combined with findings from a scoping review on existing practices will allow for recommendations to support effective and satisfactory engagement practices and facilitate older adult participation in future projects.

Engaging People Living with Dementia in Product Design, Testing, and Commercialization – A Case Study towards developing Practice Standards

Presented by Meghan Gilfoyle, University of Waterloo

Increasingly people with dementia want to be involved with the development of products and services that impact them. However, few resources currently exist to support entrepreneurs looking to engage people with dementia on technology projects. This project will explore how entrepreneurs can engage people with dementia meaningfully and respectfully in the design, testing, and commercialization of MemorySparx, a digital memory aid currently being developed by Emmetros. Results from this study will inform practical resources for entrepreneurs and people with dementia looking to collaborate, while

improving usability and usefulness of products to assist individuals with dementia to live more independently.

The Assistive Technology Related Needs and Experiences of Family Caregivers

Presented by Louise Alice Smith, University of British Columbia

To date, we have conducted 37 initial and 10 follow-up interviews to understand the needs and concerns of family caregivers. Our preliminary analysis identified three main themes. Caregivers reported that *assistive technology (AT) could help reduce physical and psychological strain*. However, *AT-related issues* included the time it takes to adjust to new technology; the difficulty of convincing care recipients to adopt it; and the supervision required. Participants identified *challenges with finding information and obtaining products and services* that they needed. Data collection is ongoing and the study will inform the development of new technologies to address caregiver needs.

MOvIT-PLUS an Internet-based System for Family Caregivers

Presented by Dominique Gélinas-Bronsard, Université de Montréal

MOvIT-PLUS is an internet-based system that is being created to support family caregivers and older adults who use assistive devices such as mobility or communication aids. We reviewed the literature of internet-based interventions for family caregivers of older adults to identify key components of MOvIT-PLUS. We then conducted 30 interviews with stakeholders to explore caregiver needs for follow up. An expert panel appraising the new knowledge prioritized the components. Lab testing of a prototype with our commercial partner TelASK is our next step. MOvIT-PLUS aims to optimize caregiver and AT user outcomes after the provision of assistive technologies.

Designing and Building a Cognitive Computing System for Caregivers: CARE-RATE (An Online Assistive Technology Rating System for Caregivers)

Presented by Hamidreza Chinaei, Toronto Rehabilitation Institute

Caregivers often face overwhelming situations in which they need to find solutions that ease their task in helping their significant others. In this context, there is a crucial need for a platform that can suggest available solutions, by responding to queries in natural language through dialogue-based search. Search engines such as Google are not optimized to converse iteratively with their users. Using IBM Watson, we are designing and building an online cognitive computing system that connects family caregivers to resources they need to support the care of people with dementia. The system collects the "missing information" and makes a "context" over a few turns of dialogue. Then, the specified query is submitted to an "information retrieval" system built with IBM Watson. We have built the indexing component that periodically maps dementia-related webpages and documents. Once the candidate answers are generated by the retrieval system, our current activity is to rank these using several intelligent ranking algorithms that consider the topic of the question and the topic of the candidate answers, the user profile, and so on. The system then will improve its performance based on user ratings, and the updated models such as updated indexes and user profiles.

Digital Divide: Understanding Differences in ICT Literacy in Canada

Presented by Choong Kim, University of Alberta

Digital literacy of caregivers must be considered when developing effective AT. Using Canadian survey data (Program for the International Assessment of Adult Competencies), we examined the relationship between sociodemographic factors and ICT literacy by age cohort. Results indicate that baby boomers scored lower on the ICT literacy scale than their younger counterparts. Moreover, results of multiple regression analyses support the 'digital divide' showing that level of ICT literacy among baby boomers reflects social disparities with regard to gender, education, income, type of occupation, immigration status, language spoken at home, and everyday experience with computers. Findings inform solutions for caregivers.

Evaluation of PostureCoach: Posture prompting technology for safer patient handling

Presented by Tara Kajaks, Toronto Rehabilitation Institute

PostureCoach is a wearable device we developed to provide real-time movement-centered feedback to reduce the risk of back injury by prompting caregivers to adopt safer postures. Our objective was to determine if PostureCoach was able to reduce the time participants spent in flexed postures. Eighteen participants were asked to perform a series of simulated patient handling tasks. Both novices and student

clinicians had reductions in 90th percentile flexion angle between baseline and coaching but professional clinicians did not. A number of improvements were identified in this pilot study that will be incorporated in the design of PostureCoach version 2.0.

Connecting Working Caregivers

Presented by Andrew Magnaye, University of Alberta

The *Connecting Working Caregivers* project is working with AGE-WELL partners as employers of caregivers to collect baseline evidence about employers' and employees' experience with and beliefs about how assistive technology can help them integrate, manage or balance their paid work and care work roles. AGE-WELL partner employers and employees completed Pulse Check Surveys and engaged in lively discussions at a knowledge mobilization forum revealing what works and what doesn't and identifying opportunities for our research to influence projects across AGE-WELL work packages as they continue to design technologies to help caregiver-employees of older adults with varying chronic conditions. > with the following two sentences "AGE-WELL partner employers and caregiver-employees completed Pulse Check Surveys and engaged in lively discussions at a knowledge mobilization forum to determine how AT can support caregiver-employees and reduce care-related human resource management challenges. Findings from our project inspire innovation and identify priorities in creating carer-friendly workplaces.

Mobile Robotics for Activities of Daily Living Assistance

Presented by Sébastien Laniel, Université de Sherbrooke

The goal is to demonstrate how mobile assistive robots can be used as a telepresence and an assistant for seniors and caregivers by providing services such as virtual visits for remote consultations, cognitive and scheduling assistance for common tasks. Users' needs and requirements are obtained through focus groups, questionnaires and with videos to illustrate what can be accomplished with robotics technologies. Assistive robots are being developed with the integration of key interaction and intelligent capabilities such as 3D navigation and mapping, sound source localization and speech recognition, vital signs monitoring, plan recognition, object and person detection, robot emotions and assistive behaviors.

Reliability and validity of the Wheelchair Skills Test version 4.2 for power wheelchair and intelligent power wheelchair use in public spaces

Presented by Martin Gerdzhev, McGill University

The Wheelchair Skills Test (WST) has not been tested with power wheelchair (PW) or intelligent power wheelchair (IPW) in an ecological environment. Our research goal is to provide evidence of the extent to which the WST can be used to assess PW and IPW performance in a mall environment. This encompasses assessment of the reliability (interrater, test-retest) and construct validity of the WST. After a training period, twelve users of PW performed fourteen tasks of the WST with a PW and IPW. These tasks were administered and scored by clinicians.

Adaptable Intelligent Domestic Environments

Presented by Jyoti Joshi, University of Waterloo

Our objective is to design an affectively aware virtual assistant for elderly persons to assist them with activities of daily living. To make an assistive technology more efficient and to ensure uptake, it is critical to understand and react to the emotional state of a user during interaction with the system. To achieve this, facial expressions of users following prompts by a virtual assistant are captured with a camera. Low level facial features are computed and emotion inferences are performed based on the principles of Affect Control Theory. Emotions are integrated in the system's decisions using a Bayesian model to make it emotionally intelligent.

Collision Avoidance and Feedback System

Presented by Pooja Viswanathan, University of Toronto

Powered mobility can offer increased independence and mobility to those who are unable to walk or to use manual wheelchairs. However, safety is a major factor in decision-making regarding provision of powered mobility devices. Older adults with a diagnosis of dementia are especially likely to be denied these devices since they often experience symptoms that make safe operation challenging or even impossible. Loss of mobility can in turn lead to depression and an increased reliance on caregivers. In order to address these issues, we have developed an add-on system that can transform any wheelchair

into a smart wheelchair that automatically detects obstacles, offers feedback to the driver, and helps prevent collisions. Our system can thus improve quality of life by increasing safety and independent mobility. We are currently commercialising this technology through a start-up, Braze Mobility Inc.

Closing the Gap to Technology Adoption: A Case Study of Older Adults with Mild Cognitive Impairment using the InTouch Communication Application at Home

Presented by Aaron Yurkewich, Toronto Rehabilitation Institute

We explore how InTouch, a tablet communication application designed for older adults, was adopted. Methods: 14 seniors, ten with Mild Cognitive Impairment (MCI), were paired with a student to learn and use InTouch for 12 weeks. Results: 12 participants completed the study, using the application to send 1212 messages. Text, audio, photo, and video features were used 705, 280, 143 and 84 times.

Conclusions: Seniors view this simplified application as a valuable means to enhance communication with friends and family. With guided weekly support, seniors learned to use this technology independently and integrated its use into their daily lives.

Creating Digital Games for Older Adults

Presented by Fan Zhang, Simon Fraser University

Using a user-centred design method, our research team collaborated with students from the game design program at the Art Institute of Vancouver and created two original digital games for tablets on archeology and art history.

We also collaborated with five Masters students at the Centre for Digital Media and created an online multiplayer escape room. Older adults can play this game online with their friends or grandchildren. They can learn together, and win by solving the challenging puzzles together to escape from the room. Our next step is to conduct field studies involving older adults and inter-generational teams.

Digital Storytelling For Older Adults

Presented by Simone Hausknecht, Simon Fraser University

We are developing an online course for seniors to create a digital story in the form of a short video. The course design combines our digital storytelling workshops with Robb Lucy's book "Legacies aren't just for dead people". In collaboration with Robb, we first created and ran the course in a classroom at SFU and we are now in the process of developing an online version to cater to a much wider audience. The course will allow seniors to reflect on their lives, share experiences, and create a digital story to give to family and friends.

Understanding Mobility Decline in Frail Older Adults: a Wearable Sensor-Based Approach

Presented by Andreas Ejupi, Simon Fraser University

Over 350,000 Canadians live in long-term care facilities with a high risk for mobility decline. The objective of my research is to develop and evaluate a wearable sensor-based system that can detect and warn care providers of significant declines in mobility. I investigate the impact of sensor placement on signals from different types of sensors (inertial, pressure and vital sign), and the possibility for integrating them into hip protectors, which are commonly worn in long-term care. The developed system will help care providers in detecting a given decline in mobility, and developing tailored interventions to arrest or reverse the decline.

A garment-based neuro-orthosis to help individuals with paralysis standing independently: design and preliminary results.

Presented by Bastien Moineau, Toronto Rehabilitation Institute

We are developing a novel wearable device to allow individuals with neurological paralysis (stroke, spinal cord injury) to stand independently. Users will stand through electrical activation of their muscles with the assistance of an electrode-imbedded garment. We are engineering fabric-based electrodes to stimulate the muscles effectively and comfortably without use of conductive gel. The purpose is to create a device as simple to don as stockings. Small portable inertial sensors will track body motions (swaying back and forth, knee flexion...) to tune those muscle activations. This neuro-orthosis could be used for acute and chronic rehabilitation, and to facilitate daily activities.

The Flooring for Injury Prevention (FLIP) Study

Presented by Chantelle Lachance, Simon Fraser University

A promising strategy for reducing the incidence and severity of fall-related injuries in long-term care (LTC) is to decrease the ground surface stiffness, and the subsequent forces applied to the body parts at impact, through installation of compliant flooring. Definitive evidence of the effects of compliant flooring on fall-related injuries in LTC is lacking. The Flooring for Injury Prevention (FLIP) Study is designed to address this gap. The FLIP Study is a 4-year randomized controlled trial of flooring in 150 resident rooms at a LTC site. The primary outcome is to determine whether compliant flooring reduces serious fall-related injuries relative to standard flooring. Results will provide insight about the potential of compliant flooring to reduce fall-related injuries and are expected to guide the development of safer facilities for vulnerable older adults.

An Automated Monitoring of Gait to Predict Changes in Falls Risk for Older Adults With Dementia

Presented by Elham Dolatabadi, Toronto Rehabilitation Institute

Falls represent a major public health problem in older adults with dementia and are associated with an increased risk of dependency, injury, and death. Preventive measures are needed to significantly reduce the frequency of falls in this population. In particular, there is a need for a tool which can identify when there is a change in the risk of falling. Our research aims to combine unobtrusive sensing and machine learning techniques to build a system capable of automatically monitoring fall risk in free-living conditions.

WP3 TECH-FAI: Technology for Supporting Functional Autonomy and Independence

Presented by William Miller, University of British Columbia; Helene Pigot, Université de Sherbrooke, Francois Michaud, Université de Sherbrooke, Jesse Hoey, University of Waterloo

Approximately one-quarter of Canadian seniors reported having some kind of physical, cognitive, or sensory impairment that affected their abilities to perform the common activities of daily living (ADL) required to maintain their functional autonomy and independence. The focus of WP3: TECH-FAI is the development and evaluation of technologies that will support older adults (and their caregivers) through a variety of physical and cognitive activities, thereby increasing mobility, participation and independence. In this talk, we will introduce you to the objectives and research activities in WP3: TECH-FAI via 3 core projects: 1) VIGIL-Robot – Mobile Robots for Telepresence and Activities of Daily Living (ADL) Assistant; 2) CoPILOT – Collaborative Power Mobility for an Aging Population; and, 3) DIY-AIDE – Do it Yourself-Adaptable Intelligent Domestic Environments and their sub-projects. We will also highlight the exciting progress we have made in achieving our objectives with technologies including robotics to assist with ADLs, smart home systems, and new applications and interventions of artificial intelligence and sensing for power mobility devices. Finally, we will briefly discuss next steps for our group including commercialization, collaboration and establishing partnerships.

WP4 TECH-APS: Technology for Active Participation in Society

Presented by David Kaufman, Simon Fraser University; Cosmin Munteanu, University of Toronto Karyn Moffatt, McGill University

The WP4 work package is a transdisciplinary project involving computer and information scientists, social scientists and educational technologists. It comprises three projects all focused on older adults social connectedness. In WP4.1, we are continuing our research and development on the InTouch communications platform for enabling senior's communications with family. In WP4.2, we have repurposed several games from our digital educational game repository, Educational Games Central, to run on tablets in single-player mode and are actively developing the multi-player versions. We have also created several new tablet-based learning games targeted at older adults as well as an online Escape Room game. In WP4.3, we have conducted digital storytelling workshops in long-term care facilities and community centres and have collected more than 70 digital stories. On the technical side, we are continuing development of an intelligent mobile support app to increase seniors' connectedness to their family members. We are also in the final stages of development of a multimodal app to support older adults' collaborative access to online health information. We have conducted co-design workshops (3-4 hours long) to envision and design features for a new digital storytelling platform that enables seniors to create digital content using a digitally enhanced pen and paper platform and have built a working prototype of this system. Finally, three new projects have been added to WP4: (1) Design requirements for novel retiree continuity management support systems; (2) Usability of video visit technologies in long-term care homes; and (3) Intergenerational digital storytelling in a first nations community.

WP5 TECH DD: Building Connections to Deliver New Technologies to Monitor Mobility and Chronic Illness in Older Adults

Presented by Frank Knoefel, Carleton University

WP 5 TECH-DD designs ambient-based and on-person technologies that measure physiological and activity data, such as fluid monitoring in congestive heart failure, monitoring and minimizing impact of falls in LTC, and developing novel rehabilitation methods for people with neurological disease. This presentation explores new connections formed within and between WPs, as well as with external partners and progress towards commercialization. Highlights will include work towards proposing an Ottawa Innovation Hub, cognitive computer games applications, and new data processing techniques for fall detection. Updates from all team representatives will be referenced to show how collaboration has broadened the network's impact and reach.

WP6 TECH-MCH: Technology for Maintaining Good Mental and Cognitive Health

Presented by Eleni Stroulia, University of Alberta; Lili Liu, University of Alberta

WP6 is developing technology-based solutions for the clinical assessment and management of these conditions. First, we are developing an automated computer-vision system for recognizing and assessing pain in persons with advanced dementia who are unable to verbally communicate their pain. Second, we have developed and are currently trialing a speech-analysis method that can efficiently and reliably identify Alzheimer disease, aphasia, and Parkinson disease. We are also developing apps for monitoring changes and types of social activities of individuals with bipolar disorder, in order to identify their mood changes in a timely manner. Finally, given the large number and variety of mental-health apps available to the general public, we are developing a scale to evaluate these apps in a standardized fashion. Second, we are working on two projects related to management of conditions. Building on our Smart-Condo™ work, in partnership with two assisted-living providers, we are studying activities of daily living (with a variety of ambient sensors) for dementia residents with challenging behaviours. We are also developing K-Rehab, a Kinect-based computer-guided personalized exercise system to help seniors exercise at home, correctly and safely. Bringing the assessment and management objectives together, we deployed an integrated platform (UniCog) with open APIs for collecting data from mobile and web-based assessment apps and engaging training games to collect and analyze multi-dimensional data on a variety of conditions and populations. One of the UniCog games, the Whack-a-Mole, has been the subject of two trials, for patients presenting with delirium in emergency rooms, and with Alzheimer disease.

Research Plenary – Session 2
October 19, 2016, 16:00 – 17:00 PM EST

WP7 POLICY-TECH: An ecosystem based approach to health and aging innovation policy: WP7 from theory to action

Presented by Dr. Josephine McMurray, Wilfrid Laurier University; Dr. Don Juzwishin, Alberta Health Services; Dr. Paul Stolee, University of Waterloo; Dr. John Hirdes

We know that innovation offers many opportunities to support and enhance the health and well-being of older adults, but raises questions about how the development of novel technologies can be encouraged, evaluated, approved, regulated, integrated and reimbursed, within fragmented and resource-constrained health systems. The research conducted in WP 7, POLICY-TECH, is shedding light on the health ecosystem, policy and regulatory landscape in Canada related to the development, implementation, and possible commercialization of health technologies (processes, goods, and services) for older adults. The POLICY-TECH projects have been developing an in-depth understanding of the issues, stakeholder perspectives and unmet needs that will need to be considered by AGE-WELL partners as they develop and commercialize aging-related innovations. We will discuss insights from our exploration of regional health innovation ecosystems; policy, regulatory, and technology assessment frameworks; and the innovation pathways for AGE-WELL products.

WP8 ETHICS-TECH: Ethical, Cultural, and Social Aspects of Technology

Presented by Jerome Bickenbach & Jeffrey Jutai, University of Ottawa Queen's University,

ETHICS-TECH is an interdisciplinary team of researchers committed to bringing ethical reflection to bear on technologies to help older Canadians to maintain their autonomy, health and social participation, and technologies used in the care and support of older adults. We are investigating factors that are most likely to contribute to disparities and ethical problems in the development, adoption and diffusion of emerging technologies. WP8 has struck an exciting balance between discovery and application-based research. Our projects both address important technology needs for older persons (e.g., safe and effective assistive device selection in WP8.1 and mobile applications for self-management of well-being in WP8.3) and simultaneously identify improvements in processes for research and developing technologies to make these processes more effective, efficient, and ethically responsible (e.g. seeking cost effective policy reforms that secure equity of availability of new and developing technologies in WP8.2). WP8 (ETHICS-TECH) has been exceptionally productive. We developed an ethics training program on researching innovative approaches to ethics training and implementing them within the Network. WP8 and WP5 (TECH-DD) are collaborating on a proposal to establish an innovation hub that engages the whole range of aging and technology stakeholders in the Ottawa region, committed to innovation and adoption of technology-based solutions and services. We are enriching the learning experiences of our trainees using a writing club, international trainee exchanges, and trainee-led webinars to develop leadership skills in knowledge translation and exchange. We received an SSHRC Insight Development Grant, "Perspectives on information and communication technology for daily activities and social inclusion among older Canadians with cognitive impairments and their caregivers", and also an AGE-WELL SIP grant, "Responsible commercial translation of a an assistive devices decision support system to improve older adults' autonomy".

Unobtrusive Monitoring of Congestive Heart Failure

Presented by Madison Cohen-McFarlane, Carleton University

With aging comes increased susceptibility to disease and disability, variations in mental capacity and decreased functioning. Unobtrusive monitoring of at risk older adults can increase their safety, prevent hospitalizations and alert health care providers when an intervention is needed. Congestive heart failure (CHF) is very common in older adults and occurs when the heart is unable to sustain the necessary blood flow throughout the body leading to reduced kidney function and fluid retention. Current monitoring methods are based on weight variations due to this fluid retention. A pressure sensor system, placed between the mattress and bedframe, is being developed in order to alert the health care professional when fluid retention increases and replace current unreliable monitoring methods.

PRED-FALL – Technologies to Predict, Prevent, and Detect Falls

Presented by Yijian Yang, Simon Fraser University

In terms of injury risk prediction, we analyzed video-captured falls by older adults, and reported that females with visual impairment were most likely to impact their head. We also reported impaired balance recovery responses during falls among those with Parkinson's disease. Regarding injury prevention, we published our protocol for an RCT of compliant flooring in long-term care. We also reported impact velocities from kinematic analysis of falls, which averaged 2.14, 2.91 and 2.87 m/s for pelvis, head and hand, respectively. For fall detection, we reported that machine learning algorithms improved on threshold approaches for detecting falls from waist-mounted sensors.

Advanced Robotic Rehabilitation - Introduction to three ongoing projects in the REACT Lab at Western University

Presented by Seyed Farokh Atashzar, University of Western Ontario

It is anticipated that the number of people worldwide who experience stroke will reach 23 million annually by 2030. Improvements in the field of robotics-assisted therapy can provide efficient, safe and affordable means of rehabilitation to help stroke patients regain a significant portion of their lost motor functions. This is the motivation for our projects in WP5.3, more specifically, to develop: (i) a safe tele-rehabilitation system which can bring the kinesthetic supervision by a remote therapist to a patient's home; (ii) a novel haptics-enabled therapist-in-the-loop framework for adaptive robotics-assisted mirror rehabilitation that can be adjusted based on the impairment level of the patient's affected limb; and (iii) low-cost inherently-safe mechanisms for lower-limb rehabilitation.

Non-invasive Electrical Neuromodulation Therapy for Overactive Bladder

Presented by Karly Franz, University of Toronto

Overactive bladder (OAB), a chronic condition marked by frequency, nocturia, and incontinence, affects 18% of adults and 30% of elderly persons in Canada. OAB can lower their quality-of-life, disturb sleep patterns, and lead to depression. Peripheral nerve stimulation is an effective treatment option but exhibits highly unpredictable outcomes. Recent work in our lab has identified a novel, long-lasting bladder-inhibitory reflex that is evoked by electrical stimulation of the saphenous nerve stimulation. In addition to better understanding the mechanism of this reflex, we are beginning to translate this technology in OAB patients.

ICT Applications for Screening, Assessment and Interventions to Enhance Mental Health

Presented by Andrea Wilkinson, University of Toronto

MEN-ASSESS is focused on screens and interventions for depression, dementia, and delirium. We are developing and evaluating: (1) a tablet-based serious game for cognitive assessment in clinical settings, (2) ambient activity and reinforcement learning technologies to manage behaviour in people living with dementia, and (3) usability standards for mental health apps targeted at older adults. Our serious game is being used in the Emergency Department at Sunnybrook Hospital and by emergency services in three

provinces as part of a trial funded by the Canadian Frailty Network. Our ambient activities will be trialed in long-term care beginning in Fall 2016.

UniCog: Fun Games Systematically Redeveloped for Cognitive Assessment and Training

Presented by Victor Guana, University of Alberta

UniCog, along with other software products, supports cognitive-function improvement through apps and games, characterized by three distinct features. First, it includes games that seniors are already familiar with and enjoy, redeveloped in a manner that systematically increases in difficulty. Second, it offers an open data-collection API for other researchers to integrate their software and hardware, and provides a repository for collecting multi-dimensional data on different aspects of visuomotor and cognitive function. Finally, it will support numerous analytics services, taking into account single or multiple data sources, for researchers, caregivers and individuals. The WOW game is the first UniCog game currently under trial.

Development, Implementation and Evaluation of an Automated Pain Detection System for Older Adults with Dementia

Presented by Erin Browne, University of Regina

Many individuals with dementia cannot report their pain due to cognitive impairment, leading to inaccurate assessment, and pain under-management/mismanagement. Though pain can be assessed in this population via behavioural observation, this requires human resources that are often unavailable. We are developing an automated computer-vision assessment system based on validated pain-related behaviours. Completed collection and coding of video-recorded pain behaviours in older adults with and without dementia informs the ongoing development of our technical specifications and computer algorithm. We will test the system in nursing homes, and are investigating stakeholder perspectives and other implementation considerations. Spin-off projects are being pursued.

The PRI-TECH Project: Understanding and Navigating Policy and Regulatory Processes

Presented by Melissa Koch, University of Waterloo

Technological innovation offers many benefits for the health of older persons, but innovators find it challenging to navigate policy and regulatory systems in multiple Canadian jurisdictions. The PRI-TECH project has examined these issues through a scoping review; interviews with Canadian policy-makers, innovators and industry stakeholders; and a survey of AGE-WELL project leaders. We have produced a primer on technology regulatory policies, and charted the innovation pathways for AGE-WELL products. Successful development and adoption of aging-related technologies would benefit from greater understanding of policy and regulatory processes, and closer partnerships among stakeholders, including older adults and caregivers.

Developing Regional Health Innovation Ecosystems: The DRiVE Project

Presented by Heather McNeil, University of Waterloo

Canada struggles to translate knowledge from research into commercially viable products and processes to transform health care systems for aging adults. The DRiVE project is working to resolve this through the development of a Theory of Action for regional health innovation ecosystems.

We have completed a systematic literature, are conducting case study research (n=3) and an ongoing developmental evaluation of an emerging Canadian innovation hub. At the AGM we will demonstrate our interactive map of global innovation entities focussed on health & aging technologies, that will be used in our survey research

Data-Driven Characterization of Groups with Varying Fall Histories

Presented by Rena Yang, University of Waterloo

To investigate similarities and differences in physical activity, heart rate and night-time sleep pattern among different faller groups, a prospective, observational study is being conducted with measurements from a wrist-worn smart wearable in a sample of community-dwelling older adults. In parallel, one case-control study was conducted utilizing an interRAI instrument to examine characteristics of different faller groups. Unsteady gait, dizziness/lightheadedness, and ADL decline were identified as the top three features associated with falls. Wearable and interRAI assessment data will be analyzed together to classify older adults into the faller groups.

Web-based Consumer Guidelines for Locator Technologies

Presented by Noelannah Neubauer, University of Alberta

Information about locator technologies provided by vendors are not consistent. Carers do not have a standard set of descriptors to compare technologies across vendors. The objective of this project is 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. Our guideline uses standard categories of descriptors populated by vendors and include cost, functionality and usability. The website will be launched on December 1, 2016 at the Locating Technology Forum in Toronto, which will be hosted by the Alzheimer Society of Ontario.

Transcultural adaptation, reliability and acceptability of an Online decision support system for the self-selection of assistive devices

Presented by Eugénie Cadieux Pinsonnault, Le Centre de santé et de services sociaux – Institut universitaire de gériatrie de Sherbrooke

AT-SELECT is a project that focusses on the bathroom, the area where older adults are at the greatest risk for falls. Our UK commercial partner developed SmartAssist, an online decision support system for the selection of assistive devices that maintain older adults safe and independent in their homes. During Y1, the transcultural adaptation of SmartAssist was performed through expert consultations and development meetings with the UK team. During Y2, we will run 140 interviews to validate the Canadian version of SmartAssist and to explore acceptability and ethical issues that are raised as we are adapting it to the Canadian context.

Aging, Disability and Technology (ADT): Understanding and Advancing Canadian Policies to Enhance Access to Assistive Technologies

Presented by Winnie Sun, University of Toronto

The ADT team are mapping the programs and policies across Canada to understand how assistive devices are currently accessed or procured in Canada. Preliminary findings indicate that challenges exist among users, caregivers and healthcare workers who seek access to devices given the complexity in identifying, understanding and applying to programs. To complement our jurisdictional scan, a scoping review is currently in progress with the aim of examining the models, frameworks and principles that have been used to understand ethical concepts and challenges related to technology access, with a focus on their use for older adults and/or those living with disabilities.

Medication Management: Making It Safe And Easy

Presented by Maxine Perrin, University of Ottawa

Our medication management application is a unique product supporting safe medication use through cognitively accessible interfaces that are easier to use than current applications. The application also emphasizes the importance of maintaining respect of users' privacy. End-users have the ability to grant or share access with caregivers. This functionality helps persons with complex healthcare needs that might require support to communicate with caregivers, while maintaining a level of independence. In addition, because information is stored electronically, the application can support communication with healthcare providers, allowing clinicians to monitor medication use more efficiently and effectively..

Effets sur les inégalités sociales de santé d'un design participatif pour développer un outil de cybersanté pour les proches aidants

Presented by Karine Latulippe, Université Laval

Les inégalités sociales de santé (ISS) peuvent être présentes chez les proches aidants et beaucoup d'espoirs sont investis dans la cybersanté afin de les réduire. Malheureusement, la cybersanté a aussi le potentiel d'augmenter ces inégalités. Ce projet vise à développer des outils de cybersanté qui tiennent compte des ISS et qui contribuent à la réduction de celles-ci. Les objectifs sont 1) identifier un processus de design d'outil de cybersanté qui tient compte des ISS par une métasynthèse descriptive; 2) en faire l'expérimentation avec des proches aidants; 3) Documenter les forces et les défis reliés à ce processus; 4) Évaluer l'utilisabilité de l'outil développé auprès de proches aidants à risque d'ISS.

Effects on Social Health Inequalities (SHI) of a Participatory Design to Develop an E-Health Tool for Caregivers

Much energy has been invested in the development of e-health to improve the health of caregivers. The lack of resources and limited access to information constitute the SHI risk factors affecting the latter. E-health has as much potential to increase SHI as to reduce them. The goal of my project is to develop e-health tools which take HSI into account and which contribute to their reduction. The objectives are 1) to identify a process for designing e-health tools which takes HSI into account by a descriptive metasynthesis; 2) to experiment this process with caregivers; 3) to examine the strengths and the challenges of this process; 4) to examine the usability of tool developed with caregivers at risk of HSI.

Registered nurses' intention to use new health information technology within home care

Presented by Sarah Ibrahim, University of Western Ontario

Empirical evidence supports the use of health information technology (HIT) for the delivery of health care services within the home care sector, the preferred place to age and receive care among older adults. Despite its documented benefits and the support by federal and provincial governments, low uptake of HIT has been reported among RNs. The study will examine factors that facilitate or inhibit the intention to using HIT by RNs practicing within the home care sector. A predictive cross-sectional study design will be used. A minimum required sample of 200 RNs from Ontario working within the home care sector will be recruited. Structural Equation Modelling (SEM) will be used to analyze the collected data. Findings can provide useful information for decision-makers, health care agencies, and policy makers on how to introduce strategies and initiatives for the successful integration and adoption of HIT by RNs into home care practice.

Development and evaluation of a user interface for an intelligent power wheelchair to increase its usability for older adults

Presented by Tricia Jose, Toronto Rehabilitation Institute

Older adults (≥ 65) are the most prevalent wheelchair users in North America but most cannot safely drive a wheelchair due to physical/cognitive impairments. Intelligent wheelchairs (IWs) could be a solution, but are minimally clinically validated or commercialized since research has always focused on the underlying intelligent system, rather than the user's needs. I'm developing a user interface (UI) for an IW that provides useful feedback to the driver, then evaluating whether it results in increased usability (effectiveness, efficiency, satisfaction) of the IW. The goal is to finally enable older adults to use IWs for prolonged but safe independent mobility.

Preventing Falls Through Improved Handhold Structural Strength Standards: Predicting Handhold Loads From Individual Weight

Presented by Vicki Komisar, Toronto Rehabilitation Institute

Well-designed handholds (e.g. handrails, grab bars) significantly enhance balance recovery and reduce the risk of injurious falls. However, the evidence base to support existing handhold structural strength standards is limited. We characterized the forces that 28/50 participants applied to handholds following simulated trips and slips, and correlated participant weight with handrail loading metrics. Weight was strongly-associated ($r > 0.5$) with peak anterior and downward handhold forces for trips, and with peak upward and lateral forces for slips. Further analyses will provide evidence for informing credible handhold structural strength standards, such that they support necessary loads without becoming unaffordable or too difficult to install due to over-design.

How Could Canada's Healthcare System Provide Coordinated, Urgent, Medical Care and Diagnostic Services At Home For Older Adults With Multi-Morbidity?

Presented by Vicky Young-Cherin, Toronto Rehabilitation Institute

This feasibility study examines the provision of coordinated, urgent, medical care and diagnostic services at home for older adults with multi-morbidity and will identify essential resources and supports required for this care model. Focus group meetings with stakeholders across the healthcare continuum will specify where older adult health may become compromised along the home-to-hospital pathway, where barriers and enablers exist, and needed essential technologies and resources. Improved access to medical care

and diagnostic services will reduce hospital transfers, emergency room bed access, and paramedic off-load delay; leading to improved healthcare system efficiencies, cost savings, and better older adult healthcare outcomes.

WP1 NEEDS-OA: Understanding the Needs of Older Adults

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

The three projects that make up WP1 have been working closely together to ensure the needs, wishes and priorities of older Canadians in relation to technology and how they wish to live their lives, are captured and understood across AGE-WELL. This involves an array of activities including engaging with older adults across in many different settings using varied methodologies and interacting with the other AGE-WELL WPs to explore their engagement with older adults. We have also created a number of resources to support AGE-WELL projects to involve older adults at all stages of the technology development process from conception to deployment. We will highlight examples of our user engagement work.

WP2 NEEDS-CG: Understanding the Needs of Caregivers

Presented by Louise Demers, Centre de Recherche de l'Institut Universitaire de Gériatrie de Montréal; Janet Fast, University of Alberta

More than 8.1 million Canadians provide care to an adult family member or friend with a long-term health condition, physical or mental disability, or aging-related needs, and more than 13 million people have been a caregiver at some point in their lives. WP2 has used a mixed methods approach to understand the needs of family/friend carers through: individual interviews and focus groups with caregivers, analysis of national survey data on caregiving and ICT literacy, systematic literature reviews on effective web-based interventions, and detailed assessment of existing AT products for caregivers from a design perspective. We have learned how caregiving is insidious, changes over time, and impacts caregivers' health, relationships, social participation, finances and employment. While AT might meet some of the needs expressed by family caregivers, caregivers are ambivalent about AT and few existing AT products target caregivers' own needs specifically. Caregivers speak about the challenges of finding information on the web that is targeted to their needs from sources that are trustworthy. Web-based interventions (such as monitoring technologies, on-line support systems, and resources etc.) that lead to better outcomes for caregivers are interactive, model appropriate behaviour, incorporate professional support, and provide instructions and social support. Yet such tools must take the social disparities in ICT literacy into account. Findings across WP2 highlight the gap between caregivers' own needs and the current state of AT product development, and will inform user-driven or co-designed solutions for family/friend caregivers.

Catalyst Grant Projects
October 20, 2016, 11:45 – 12:30 PM EST

Connecting Working Caregivers (CWIC)

Presented by Janet Fast, University of Alberta

The Connecting Working Caregivers project is working with AGE-WELL partners as employers of caregivers to collect baseline evidence about employers' and employees' experience with and beliefs about how assistive technologies (AT) can help them integrate, manage or balance their paid work and care work roles. Currently, 1/3 of all Canadian employees are caring for a family member or friend with a long term health condition or disability. AT has the potential to reduce the negative consequences for employees including absenteeism, turnover and presenteeism (being distracted). AGE-WELL partner employers and their caregiver employees completed Pulse Check Surveys and attended an invitational knowledge mobilization forum where preliminary survey findings were shared and AT solutions envisioned. Lively discussions at the forum raised awareness of the issues faced by caregiver-employees in balancing their care and paid work responsibilities and created excitement about new AT that could have a positive impact for employers and employees.

Supporting our Aging Workforce

Presented by Max Evans, McGill University

Retirement has a significant impact, both positive and negative, on the retired person, organizations, and at a larger scale, on Canadian industry. For an individual, retirement can negatively affect their physical, mental, and health status. For an organization, it can mean the loss of information and knowledge. To date, no tools to capture knowledge and transfer have been developed in order to meet the needs and preferences of older workers. Our research will address this need by examining employees' preferences as to the methods and technologies for communicating knowledge before and after retirement. This research focuses on developing a set of design specifications for support systems to manage the continuity of new retirees that are compatible with the needs and preferences of older workers and their successors. To date we have conducted a competitive/market analysis, which will be discussed during the Catalyst grant presentations.

1. **3DHC: Data-Driven Decision Making in Health Care**

Presented by Rena Yang, University of Waterloo

The utility of innovative technologies was explored by investigating current research trends in the smartphone-based chronic disease management for older adults. Acceptance, usage and dimensions that influence the use of commercially available wrist-worn smart wearables in older adults was explored using a mixed-methods approach. To bridge home care (HC) clients and health care sectors, falls classification model was built utilizing Residential Assessment Instrument (RAI-HC) data of all HC clients in Ontario, Canada. Physical activity data collected with a wrist-worn smart wearable will be used to investigate caregiver stress in informal caregivers of older adults with dementia.

2. **A Conceptual Framework to Describe Levels of Risk Associated with Wandering in Dementia**

Presented by Noelannah Neubauer, University of Alberta

While a single definition of dementia-related wandering has been attempted, it does not acknowledge the range of risks the term represents. This project aims to develop a conceptual framework of wandering. This framework describes three levels of risk associated with wandering and is illustrated through an infographic. Such levels can be used to identify what technologies may be used to mediate these risks. The infographic will be launched in conjunction with the web-based consumer guideline for locator technologies on December 1, 2016 at the Locating Technology Forum in Toronto, hosted by the Alzheimer Society of Ontario.

3. **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 initial test-retest reliability and validity of the tool in screening for delirium onset. Performance on our screening tool is comparable to 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 of our serious game for screening for both cognitive and functional abilities, as an alternative and complementary method to existing non-computerized methods.

4. **A systematic review of internet-based interventions for caregivers of older adults: critical appraisal of components and effects**

Presented by Dominique G elinas-Bronsard, Universit e de Montr al

We conducted a systematic review to explore which components of internet-based interventions generate the best outcomes when remotely supporting caregivers of older adults. We found 42 studies, 12 of which had high levels of evidence. These studies suggest that internet-based interventions that are interactive, model appropriate behaviour, incorporate professional support and provide instructions and social support lead to better outcomes for caregivers such as decreasing depressive symptoms, anxiety and perceived burden, as well as increasing self-efficacy. Our results will inform the development of a future web-based system for the monitoring and training of caregivers of older adults.

5. **Access to Assistive Devices Across Canada**

Presented by Daphne Schreiber, March of Dimes

Despite high needs, many Canadians with disabilities report having unmet assistive device needs. To understand how assistive devices are currently accessed or procured in Canada, we conducted a jurisdictional scan to identify funding and service gaps by mapping the programs and policies across

Canada using the key stages of scoping review methods. Preliminary findings indicate that challenges exist for the users who seek access to devices given the complexity in identifying, understanding and applying to programs. A coordinated and streamlined approach is needed that allows users to more easily identify and apply to programs for which they are potentially eligible.

6. Adaptable Intelligent Domestic Environments

Presented by Aaron Li, University of Waterloo

Automation systems can improve efficiency of caregiving by providing simple tools to relieve burden during activities of daily living. However, these automation systems are often difficult to design, set up, and maintain due to the different mental representations, emotional understanding, and expertise levels of the different parties involved (algorithm designers, researchers, industry experts, caregivers, and persons in need of care). In order to allow rapid, agile, flexible, and efficient bidirectional information flow between these parties, we are designing an abstract level framework that allows industry experts to define products and services, researchers to integrate and test algorithms and prototypes, caregivers and end-users to formalize and communicate their implicit, possibly non-technical knowledge of needs and preferences and to report on successes and failures of developed systems.

7. Aging-related health technologies: Challenges and opportunities for economic evaluation

Presented by Sanyal Chiranjeev, University of Waterloo

Background: In Canada and other developed countries, life expectancy among individuals 65 years and older has grown, as has the proportion of older persons with health concerns and chronic conditions that challenge their quality of life and independence. Innovations in health technologies have the potential to mitigate these challenges and to reduce their health system dependency and economic impact, however limited research and evaluation has been conducted to assess their cost-effectiveness or other economic benefits. Objective: To explore available literature on the cost-effectiveness, cost-benefit and cost-utility of health technologies for older adults, and to identify priorities for future research. Methods: Peer-reviewed literature was searched using electronic databases including MEDLINE, EMBASE, Cochrane Library, and The Health Technology Assessment Database. An internet search was conducted to identify relevant grey literature. Preliminary results: Few economic evaluation studies have been conducted for aging-related health technologies. Most of the available data come from small pilot studies without a control group comparison. A variety of outcome measures have been used, making it difficult to compare and synthesize findings. Conclusion: Economic evaluations are important for the successful adoption, reimbursement and diffusion of health technologies, however application of these methods for aging-related technologies has been limited. Recommendations are made to support greater integration of economic evaluation in the assessment of AGE-WELL technologies.

8. An analysis of the spatial distribution of older adults' falls in long-term care

Presented by Kim van Schooten, Simon Fraser University

Falls are a major health and economic burden in our aging population, particularly among frail older adults. To identify environmental factors contributing to falls, we mapped the spatial locations of 808 fall events within a long-term care facility. We identified 5 hot spots, which were close to couches and chairs where people fell frequently during transferring or slid out of their chairs, and close to a transition in flooring material where people fell frequently during gait initiation. We further found that 91% of fall density could be explained by resident density; in other words, the greater the number of people in a given area, the greater the risk for falls. We hypothesize that this might be due to greater exposure (more time spent) or clutter (more obstacles or distraction).

9. An Automated Monitoring of Gait to Predict Changes in Falls Risk for Older Adults With Dementia

Presented by Elham Dolatabadi, Toronto Rehabilitation Institute

Falls represent a major public health problem in older adults with dementia and are associated with an increased risk of dependency, injury, and death. Preventive measures are needed to significantly reduce the frequency of falls in this population. In particular, there is a need for a tool which can identify when there is a change in the risk of falling. Our research aims to combine unobtrusive sensing and machine learning techniques to build a system capable of automatically monitoring fall

risk in free-living conditions.

10. An Information-Centric Framework for Mobile Collaboration between Seniors and Caregivers that Balances Independence, Privacy, and Social Connectedness

Presented by Yomna Aly, University of Toronto

Seniors struggle with finding accurate sources of information and with understanding the medical terminology discussed in articles and online sources of information relevant to medical and health care. However, as complexity of knowledge, size of caregiver circle, and reliance on computers are all increasing, seniors need to maintain their sense of control and independence in their information-centered activities, as well as be able to access reliable trusted information sources. As such, what is needed is a more integrated approach to acquiring, managing, and sharing increasingly-complex information. This framework is currently being tested and deployed as a collaborative browser extension that facilitates information seeking and sharing, increases seniors' confidence in the information presented, and satisfies their need of privacy and independence. We envision that this can be achieved through the use of semi-automated information and collaboration tools such as summarizing, annotating, and the placement of virtual sticky notes in online documents such as health article, with placement and content of such tools being suggested algorithmically and managed by the older adult in collaboration with caregivers or family members.

11. Building capacity for health innovation in Canada: Of regions, relationships & risk

Presented by Heather McNeil, University of Waterloo

In an increasingly networked society, regional perspectives are enduringly relevant. We present results of the first in a series of case studies, examining regional health innovation ecosystems (RHIEs). Semi-structured interviews and one focus group were conducted in Surrey, B.C.'s Innovation Boulevard. Archival documentation and verbatim transcripts of interviews were analyzed using NVIVO-11©. An abductive and thematic approach was used to examine case data and suggest a theoretical framework that explains the events in the development of an early stage, "greenfield" regional health innovation ecosystem. We found some factors in common with other sectors, and others unique to health and aging sectors, as well as the local region. This work contributes to our development of foundational antecedents that help build regional capacity to support innovative health & aging technologies.

12. Compliant Flooring to Prevent Fall-Related Injuries in Older Adults: A Scoping Review

Presented by Chantelle Lachance, Simon Fraser University

Compliant flooring (CF) may reduce fall-related injuries in older adults, but there is a lack of synthesized evidence. We conducted a scoping review to answer: what is presented about the biomechanical efficacy, clinical-effectiveness, cost-effectiveness, and workplace safety associated with CF systems that aim to prevent fall-related injuries? We included 84 unique records plus 56 companion reports and concluded CF is a promising strategy for preventing fall-related injuries from a biomechanical perspective. Additional research is warranted to confirm whether CF (i) prevents fall-related injuries in real-world settings, (ii) is a cost-effective intervention strategy, and (iii) can be installed without negatively impacting workplace safety.

13. Computer Vision Based Facial Expression Analysis for Recognizing Pain in Older Adults

Presented by Ahmed Bilal Ashraf, Toronto Rehabilitation Institute

Older adults living in long-term care facilities with advanced dementia are unable to verbally communicate their pain. As a result, their pain condition remains undertreated due to sole dependence on nursing staff. The goal of this project is to develop a computer based system which automatically recognizes the facial expressions of pain. We have gathered videos of 102 elderly people and have coded them for the presence/absence of pain. These ratings are being used for building computer models for automatically detecting pain. We are also gathering perspectives of multiple stakeholders to devise a technology adoption roadmap for our system.

14. Connecting Working Caregivers (CWIC)

Presented by Andrew Magnaye, University of Alberta

The Connecting Working Caregivers project is working with AGE-WELL partners as employers of caregivers to collect baseline evidence about employers' and employees' experience with and beliefs

about how assistive technology can help them integrate, manage or balance their paid work and care work roles. AGE-WELL partner employers and caregiver-employees completed Pulse Check Surveys and engaged in lively discussions at a knowledge mobilization forum to determine how AT can support caregiver-employees and reduce care-related human resource management challenges. Findings from our project inspire innovation and identify priorities in creating carer-friendly workplaces.

15. Design and Implementation of a Novel Two-DOF Actuated System for Ankle Robotic Rehabilitation

*Presented by **Vahid Mehrabi, University of Western Ontario***

In order to address some of the challenges associated with conventional therapy, several robotic systems have been developed to provide post-stroke rehabilitation. However, most of the robotic rehabilitation systems currently available have been developed for delivering upper-limb (UL) therapy. Our recent work has focused on the development of robotic devices for lower-limb (LL) rehabilitation. In this context, we have developed a novel inherently-safe light-weight back-drivable friction-based actuation mechanism for ankle training that can be attached to a mobile platform.

16. Designing and Building a Cognitive Computing System for Caregivers: CARE-RATE (An Online Assistive Technology Rating System for Caregivers)

*Presented by **Hamidreza Chinaei, Toronto Rehabilitation Institute***

Caregivers often face overwhelming situations in which they need to find solutions that ease their task in helping their significant others. In this context, there is a crucial need for a platform that can suggest available solutions, by responding to queries in natural language through dialogue-based search. Search engines such as Google are not optimized to converse iteratively with their users. Using IBM Watson, we are designing and building an online cognitive computing system that connects family caregivers to resources they need to support the care of people with dementia. The system collects the "missing information" and makes a "context" over a few turns of dialogue. Then, the specified query is submitted to an "information retrieval" system built with IBM Watson. We have built the indexing component that periodically maps dementia-related webpages and documents. Once the candidate answers are generated by the retrieval system, our current activity is to rank these using several intelligent ranking algorithms that consider the topic of the question and the topic of the candidate answers, the user profile, and so on. The system then will improve its performance based on user ratings, and the updated models such as updated indexes and user profiles.

17. Developing a toolkit to assist designers in selecting User Centered Design methods for assessing needs of older adults

*Presented by **Joash Sujan, Ryerson University***

Requirements elicitation is the process of discovering the requirements through consultation with stakeholders, from system documents, domain knowledge, and market studies (Sommerville and Sawyer, 1997, p. 11). Measuring and fulfilling requirements of older adults in the development of assistive devices can result in successful products, reduce product recalls and avoid frequent design modifications (Martin et al., 2006). Despite the increasing population of older adults designers, organizations or researchers tend to focus on younger adult audiences in the design process. In addition, most needs or requirements gathering methods have been developed using a similarly focused user population. Older adults may have a varying and diverse set of needs that are different from younger users and they may also have different cognitive, physical, social/cultural and perceptual abilities that affect the expression and measurement of those needs. As a result older adults have generally been excluded from the development process, particularly of assistive technologies, or are being consulted at the end of the design process (Peterson, 2013). Although the traditional requirements elicitation process takes factors such as problem statement, project domain and final customers (Hickey & Davis, 2002) into consideration, the inclusion of human capability demands from the participants to accommodate them in the needs gathering process is often overlooked. To address this issue a new toolkit will be constructed and evaluated with goal of providing a more inclusive and user-centered needs elicitation process for designers.

18. Development and evaluation of a user interface for an intelligent power wheelchair to increase its usability for older adults

*Presented by **Tricia Jose, Toronto Rehabilitation Institute***

Older adults (≥ 65) are the most prevalent wheelchair users in North America but most cannot safely

drive a wheelchair due to physical/cognitive impairments. Intelligent wheelchairs (IW) could be a solution, but are minimally clinically validated or commercialized since research has always focused on the underlying intelligent system, rather than the user's needs. I'm developing a user interface (UI) for an IW that provides useful feedback to the driver, then evaluating whether it results in increased usability (effectiveness, efficiency, satisfaction) of the IW. The goal is to finally enable older adults to use IWs for prolonged but safe independent mobility.

19. Digital Storytelling and Dementia

Presented by Hollis Owens, Simon Fraser University

Digital storytelling is a form of narrative that creates short films using media including photos, sound, music, and videos. Our project's purpose is to explore and understand the experiences of digital storytelling as perceived and expressed by the storytellers - people with dementia (PwD). This project is being carried out at three sites: Edmonton, Vancouver and Toronto. The project is an 8-session workshop, where PwD create digital stories with the help of the research team and talk about the experience. Potential benefits include creating a legacy, establishing one's identity, self-expression, and a way to convey the meaning of their lives.

20. Effets sur les inégalités sociales de santé d'un design participatif pour développer un outil de cybersanté pour les proches aidants

Presented by Karine Latulippe, Université Laval

Les inégalités sociales de santé (ISS) peuvent être présentes chez les proches aidants et beaucoup d'espoirs sont investis dans la cybersanté afin de les réduire. Malheureusement, la cybersanté a aussi le potentiel d'augmenter ces inégalités. Ce projet vise à développer des outils de cybersanté qui tiennent compte des ISS et qui contribuent à la réduction de celles-ci. Les objectifs sont 1) identifier un processus de design d'outil de cybersanté qui tient compte des ISS par une métasynthèse descriptive; 2) en faire l'expérimentation avec des proches aidants; 3) Documenter les forces et les défis reliés à ce processus; 4) Évaluer l'utilisabilité de l'outil développé auprès de proches aidants à risque d'ISS.

Effects on Social Health Inequalities (SHI) of a Participatory Design to Develop an E-Health Tool for Caregivers

Much energy has been invested in the development of e-health to improve the health of caregivers. The lack of resources and limited access to information constitute the SHI risk factors affecting the latter. E-health has as much potential to increase SHI as to reduce them. The goal of my project is to develop e-health tools which take HSI into account and which contribute to their reduction. The objectives are 1) to identify a process for designing e-health tools which takes HSI into account by a descriptive metasynthesis; 2) to experiment this process with caregivers; 3) to examine the strengths and the challenges of this process; 4) to examine the usability of tool developed with caregivers at risk of HSI.

21. Engaging People Living with Dementia in Product Design, Testing, and Commercialization – A Case Study towards developing Practice Standards

Presented by Meghan Gilfoyle, University of Waterloo

Increasingly people with dementia want to be involved with the development of products and services that impact them. However, few resources currently exist to support entrepreneurs looking to engage people with dementia on technology projects. This project will explore how entrepreneurs can engage people with dementia meaningfully and respectfully in the design, testing, and commercialization of MemorySparx, a digital memory aid currently being developed by Emmetros. Results from this study will inform practical resources for entrepreneurs and people with dementia looking to collaborate, while improving usability and usefulness of products to assist individuals with dementia to live more independently.

22. Ethical Concepts and Challenges related to Assistive Technology Access: A Scoping Review Protocol
Presented by Winnie Sun, University of Toronto

Our scoping review will be conducted to examine the ethical concepts and challenges related to assistive technology access and procurement, which includes six stages: 1) conducting broad searches to identify potentially relevant literature; 2) refining selection criteria; 3) reviewing search results; 4) mapping literature according to conceptual areas of interest; and 5) summarizing results. Findings will provide insight into the literature related to ethical concepts and challenges pertaining to technology access. We plan to use the findings to help inform a series of citizen panels in Canada to identify Canadians' values and preferences for enhancing equitable access to assistive technology.

23. Evaluation of PostureCoach: Posture prompting technology for safer patient handling
Presented by Tara Kajaks, Toronto Rehabilitation Institute

PostureCoach is a wearable device we developed to provide real-time movement-centered feedback to reduce the risk of back injury by prompting caregivers to adopt safer postures. Our objective was to determine if PostureCoach was able to reduce the time participants spent in flexed postures. Eighteen participants were asked to perform a series of simulated patient handling tasks. Both novices and student clinicians had reductions in 90th percentile flexion angle between baseline and coaching but professional clinicians did not. A number of improvements were identified in this pilot study that will be incorporated in the design of PostureCoach version 2.0.

24. Features Important to Older Adults When They Choose Technology for Everyday Use
Presented by Anar Dilara, Ontario Shores Centre for Mental Health Sciences

Introduction and rationale: Older adults and stake-holders were invited to a user engagement workshop to have conversation on how older adults make decisions about their technology choice. The purpose was to develop a concept on elder-friendly technology; what features need to be included when designing age-specific technologies for seniors. **Objectives:** Types and features important to them and if they were willing to learn new technology. **Methodology:** There were three sessions at the workshop; **Technology interaction:** positive and negative aspects on usability, aesthetics, easiness to use, clarity of instructions and if required for everyday life. **Show and Tell:** Loved and abandoned Technologies with reasons. **Scavenger Hunt:** Feedback on five high-end technologies. **Findings:** Touch screen - most preferred, After-sales customer service support **Challenges:** price, unclear user manual, incorrect results, need another device to work with, need internet for book-readers, video-conferencing, robot, and lack of warning signs (PPD, prohibited signs).

25. Guided Digital Storytelling with Family Pictures to Support Older Adults' Reminiscence
Presented by Bennett Axtell, University of Toronto

Seniors' needs or interests are often ignored in the design and development of new technologies, causing many new applications that may benefit them to be overlooked. Digital storytelling is one such emerging application, which in its traditional format has been shown to decrease social isolation in older adults by increasing reminiscence. Saving family knowledge inherently requires storytelling, but is burdensome and requires motivation, especially for seniors who will often not see their input as desired and so will not share or socialize. We propose a new multimodal interface that incentivizes seniors to reminisce and tell stories from family photos beyond just the facts of what the photo contains. The proposed authoring tool is based on speech interaction, and allows for the creation of unstructured, free-flowing oral stories by older adult users as guided by the app. This tool is intended to act as a trigger for storytelling by being enjoyable to use and by having shareable outputs (i.e. multimedia stories and automatic, robust photo organization) that preserve family memories, and is expected to decrease social isolation among seniors and preserve family knowledge without undue effort.

26. Health Technology Assessment and Aging: An idea whose time has come
Presented by Heather McNeil, University of Waterloo

Traditionally, health technology assessment (HTA) has not focused specifically on aging-related issues. But at the 2015 meetings of HTAi, and the Canadian Agency for Drugs and Technology in

Health Drs. Paul Stolee and Juzwishin started generating interest in the HTA community to explore issues related to aging. To build on that interest we organized a panel entitled “Health Technology Assessment and Aging: International Perspectives of Challenges and Opportunities” with representation from five countries: China, Japan, South Korea, Italy, and Canada. Discussions and reflections from our panel will be shared, including important issues in HTA and aging internationally.

27. How Could Canada’s Healthcare System Provide Coordinated, Urgent, Medical Care and Diagnostic Services At Home For Older Adults With Multi-Morbidity?

Presented by Vicky Young-Cherin, Toronto Rehabilitation Institute

This feasibility study examines the provision of coordinated, urgent, medical care and diagnostic services at home for older adults with multi-morbidity and will identify essential resources and supports required for this care model. Focus group meetings with stakeholders across the healthcare continuum will specify where older adult health may become compromised along the home-to-hospital pathway, where barriers and enablers exist, and needed essential technologies and resources. Improved access to medical care and diagnostic services will reduce hospital transfers, emergency room bed access, and paramedic off-load delay; leading to improved healthcare system efficiencies, cost savings, and better older adult healthcare outcomes.

28. How Research And Development Projects Engage Older Adults: Older Adults’ Active Involvement in Aging and Technology Research and Development (OA-INVOLVE) Project

Presented by Izabela Panek, Dalhousie University

OA-INVOLVE focuses on participatory methods for engaging older adults in technology research and development. We aim to establish best practices for involving older adults in the research process. We partner with community-based organizations, AGE-WELL projects, and seniors to assess how older adults are currently involved in research, their level of engagement along the spectrum from research participant to advisor to decision maker, as well as their experiences, and outcomes achieved. This, combined with findings from a scoping review on existing practices will allow for recommendations to support effective and satisfactory engagement practices and facilitate older adult participation in future projects.

29. Les TIC comme outil de transfert de connaissance vers le client et ses proches : réflexion sur les impacts potentiels d’une approche centrée sur le client

Presented by Vanessa Chenel, Université de Montréal

École de réadaptation, Faculté de médecine, Université de Montréal; 2Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain (CRIR); 3École de réadaptation, Faculté de médecine et des sciences de la santé, Université de Sherbrooke; 4Centre de recherche sur le vieillissement de Sherbrooke (CDRV)

La hiérarchie des niveaux d’expertise en santé est souvent illustrée par une pyramide, où les niveaux supérieurs possèdent des rôles et des savoirs plus approfondis. En contexte de rareté des ressources, des pressions s’exerçant entre ces frontières mènent au transfert de rôles. Cette hiérarchisation se concentre toutefois sur le potentiel d’action des intervenants et s’attarde peu au client et à ses proches. Or, l’augmentation des demandes de consultation reliées au maintien à domicile des aînés invite à une réorganisation de la disponibilité de l’information chez cette clientèle. Cette affiche expose une réflexion sur l’apport potentiel des technologies de l’information et d’interventions associées (aides à la décision, systèmes experts) comme véhicule du transfert des connaissances.

30. Lessons on meaningful engagement of older adults in innovation ecosystems

Presented by Heather McNeil, University of Waterloo

Health innovation offers potential benefits for the well-being of older adults and caregivers. Regional Innovation Ecosystems (RIEs), involving industry, government and academic stakeholders, have been proposed to support development and commercialization of innovations. We sought to understand whether older adults and caregivers contribute their perspectives to RIEs, and how their role could be enhanced. A three-phase integrated mixed-methods study, emphasizing stakeholder engagement was conducted involving a scoping review on user engagement in RIEs; individual/focus group interviews with older adults and caregivers (n=15), and with representatives from university,

government, and industry (n=20); and Concept Mapping. This study revealed that there is little meaningful involvement of older adults and caregivers in RIEs. Enhancing their involvement will require a recognition of the need for diversity of older adult and caregiver representation, consideration of barriers such as system constraints and traditional partnerships, and recognition of multiple roles for older adults in health innovation.

31. Mental Health Assessments in Older Adults

Presented by Peyman Azad-Khaneghah, University of Alberta

Innovative mental health assessments are examined in three projects. (1) Tablet-based serious games to implement as a screening tool in emergency departments: These were validated with standard cognitive assessments, measures of frailty and functional status. (2) Two ambient activities created to address challenging behaviours in residents with dementia: The impact of these activities in long-term care settings is being determined. (3) A scale to rate mental health apps for older adults: This scale will undergo reliability testing and validation using a selection of mental health apps available to the public.

32. Non-invasive Electrical Neuromodulation Therapy for Overactive Bladder

Presented by Karly Franz, University of Toronto

Overactive bladder (OAB), a chronic condition marked by frequency, nocturia, and incontinence, affects 18% of adults and 30% of elderly persons in Canada. OAB can lower their quality-of-life, disturb sleep patterns, and lead to depression. Peripheral nerve stimulation is an effective treatment option but exhibits highly unpredictable outcomes. Recent work in our lab has identified a novel, long-lasting bladder-inhibitory reflex that is evoked by electrical stimulation of the saphenous nerve stimulation. In addition to better understanding the mechanism of this reflex, we are beginning to translate this technology in OAB patients.

33. Patient-robot Interaction Safety in Robotic and Telerobotic Rehabilitation Systems

Presented by Seyed Farokh Atashzar, University of Western Ontario

It is projected that Canadians over the age of 65 will account for one-fourth of the population by 2036, placing a heavy burden on Canada's healthcare system. In this regard, robotics is expected to play a major role. In particular, rehabilitation robotics is attracting a great deal of attention for delivering repetitive interactive therapies. However, there are several challenges with the use of this technology including accessibility and safety. This project is concerned with guaranteeing the safety of patient-robot interaction and developing telerobotic rehabilitation to be ultimately used for delivering in-home therapies

34. Preventing Falls Through Improved Handhold Structural Strength Standards: Predicting Handhold Loads From Individual Weight

Presented by Vicki Komisar, Toronto Rehabilitation Institute

Well-designed handholds (e.g. handrails, grab bars) significantly enhance balance recovery and reduce the risk of injurious falls. However, the evidence base to support existing handhold structural strength standards is limited. We characterized the forces that 28/50 participants applied to handholds following simulated trips and slips, and correlated participant weight with handrail loading metrics. Weight was strongly-associated ($r > 0.5$) with peak anterior and downward handhold forces for trips, and with peak upward and lateral forces for slips. Further analyses will provide evidence for informing credible handhold structural strength standards, such that they support necessary loads without becoming unaffordable or too difficult to install due to over-design.

35. Registered nurses' intention to use new health information technology within home care

Presented by Sarah Ibrahim, University of Western Ontario

Empirical evidence supports the use of health information technology (HIT) for the delivery of health care services within the home care sector, the preferred place to age and receive care among older adults. Despite its documented benefits and the support by federal and provincial governments, low uptake of HIT has been reported among RNs. The study will examine factors that facilitate or inhibit the intention to using HIT by RNs practicing within the home care sector. A predictive cross-sectional study design will be used. A minimum required sample of 200 RNs from Ontario working within the

home care sector will be recruited. Structural Equation Modelling (SEM) will be used to analyze the collected data.

Findings can provide useful information for decision-makers, health care agencies, and policy makers on how to introduce strategies and initiatives for the successful integration and adoption of HIT by RNs into home care practice.

36. Results from a novel digital storytelling workshop for older adults

Presented by Michelle Vanchu-Orosco, Simon Fraser University

Digital storytelling (DS) is a form of narrative used to create short movies. The Digital Storytelling Workshop for older adults provides older adults with tools to create their own digital stories. Overall project goals are to: (i) investigate older adults' experiences using DS as a communicative and learning tool as they often have little access to, hesitate to use, digital technology, (ii) shed light on how DS can address media and technology literacy issues, (iii) emphasize communication and socialization using DS as an innovative teaching/learning device, and (iv) uncover the meanings and lessons learned by providing participants opportunities to reflect on and share their life journeys.

Results indicate the workshop is an enjoyable event, stretches participants' cognitive abilities, and draws them into 21st century technologies. Insights into DS development will have important implications for maintaining and developing technological literacy, as well as cognitive and communication skills of older adults.

37. Smart daily objects for ageing well at home

Presented by Hubert Kenfack-Ngankam, Université de Sherbrooke

People with dementia have difficulty to achieve some basic activities of daily living (ADL). Objects involved in specific ADLs can be redesigned, augmented with sensors and effectors, and networked to foster autonomy and ageing at home. Two prototypes of such smart daily objects are under development. The first one, a smart trash can informs the person about its status (fullness, garbage day) and provides cues on when and where to empty it. The second one, a meal tray purposefully designed, will provide hints on appropriate sequences when eating and will collect relevant data related to eating.

38. Technologically Assisted Mindfulness Meditation as an Early Adjunct Nonpharmacological Intervention for Reducing Cognitive Decline in Dementia", presented as part of the Technologies for Aging Gracefully Lab at the University of Toronto

Presented by Simon Cook, University of Toronto

While there is increasing evidence for mindfulness meditation practice as an adjunct non-pharmacological intervention for neurodegenerative diseases by increasing cognitive reserve, learning and maintaining a meditation practice as an older adult have particular challenges which current practices are not designed to address. 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.

39. Technologies to Predict, Prevent, and Detect Falls

Presented by Yijian Yang, Simon Fraser University

In terms of injury risk prediction, we analyzed video-captured falls by older adults, and reported that females with visual impairment were most likely to impact their head. We also reported impaired balance recovery responses during falls among those with Parkinson's disease. Regarding injury prevention, we published our protocol for an RCT of compliant flooring in long-term care. We also reported impact velocities from kinematic analysis of falls, which averaged 2.14, 2.91 and 2.87 m/s for pelvis, head and hand, respectively. For fall detection, we reported that machine learning algorithms improved on threshold approaches for detecting falls from waist-mounted sensors.

40. Technology Adoption Readiness in Long-Term Care Facilities

Presented by Natasha Gallant, University of Regina

We are currently developing a computer vision system that will automatically detect and monitor pain behaviours in long-term care facilities (LTC). Using implementation science methodologies, we will

engage stakeholders (e.g., older adults, nurses, policymakers) in order to assess readiness for the adoption of this and other related technologies. Using a mixed-methods approach, we will identify barriers and facilitators to the adoption of the technology and, with stakeholder input, we will devise an implementation approach that would maximize the probability of a seamless and successful technology adoption.

41. The Assistive Technology Related Needs and Experiences of Family Caregivers

Presented by Randa Dalle, University of British Columbia

To date, we have conducted 37 initial and 10 follow-up interviews to understand the needs and concerns of family caregivers. Our preliminary analysis identified three main themes. Caregivers reported that assistive technology (AT) could help reduce physical and psychological strain. However, AT-related issues included the time it takes to adjust to new technology; the difficulty of convincing care recipients to adopt it; and the supervision required. Participants identified challenges with finding information and obtaining products and services that they needed. Data collection is ongoing and the study will inform the development of new technologies to address caregiver needs.

42. Therapist-in-the-Loop Adaptive Robotics-Assisted Mirror Rehabilitation Therapy

Presented by Mahya Shahbazi, University of Western Ontario

This poster presents a haptics-enabled therapist-in-the-loop framework for adaptive robotics-assisted mirror rehabilitation that is adjusted based on the impairment level of the patient's affected limb. The framework provides patient-specific treatment that actively engages the patient by adapting to his/her motor capability and thus enhancing the degree of motor-function recovery. The architecture, which is designed for patients with hemiparesis and/or hemispatial neglect, also enables tele/in-home rehabilitation while ensuring closed-loop stability of the system as well as safety and comfort of the patient.

43. Towards transdisciplinarity in technology research and development: Overview and lessons learned from AGE-WELL WP8.3

Presented by Hajer Chalghoumi, University of Ottawa

Based on the experience of the AGEWELL WP8.3 project, this poster presents an innovative approach to transdisciplinary and inclusive technology research and development. Our project aims to study ethical factors that arise during the development, commercialization, diffusion and adoption of a technology that support safe use of medications among aging persons with cognitive impairments. This project relies on the ongoing involvement of key knowledge and technology users (aging persons with cognitive impairments and caregivers), alongside relevant stakeholder groups (healthcare professionals and managers, health informatics, legal advisors, policy makers, etc.) and researchers from different scientific fields (ethics, psychology, health sciences, etc.)

44. Understanding Mobility Decline in Frail Older Adults: a Wearable Sensor-Based Approach

Presented by Andreas Ejupi, Simon Fraser University

Over 350,000 Canadians live in long-term care facilities with a high risk for mobility decline. The objective of my research is to develop and evaluate a wearable sensor-based system that can detect and warn care providers of significant declines in mobility. I investigate the impact of sensor placement on signals from different types of sensors (inertial, pressure and vital sign), and the possibility for integrating them into hip protectors, which are commonly worn in long-term care. The developed system will help care providers in detecting a given decline in mobility, and developing tailored interventions to arrest or reverse the decline.

45. Understanding Touch-Based Interaction of Older Adults

Presented by Afroza Sultana, McGill University

Adults aged 65 years, and older, comprise one of the fastest growing populations in the world. Modern technologies like mobile applications for health monitoring, and social networking, can help older adults to carry on their activities, both independently and socially. However, many older adults cannot take the full advantage of these technologies because of age related physical and sensory declines. Although performance evaluation measures for target selection tasks have been extensively studied, little is known about the capabilities of older adults during unconstrained tasks on touch-screens. In addition, major performance evaluation models were developed from indirect input

devices, which may not fully capture the complexities of three-dimensional touch-based interaction. This work aims to investigate the general traits of target selection behaviour of older adults on touch-screens. The findings will contribute to the design of accessible touch-based interfaces, including the digital storytelling environments we are designing in WP 4.3.

46. Unmet Needs of Rural/Remote Older Adults: Opportunities for Technology Development

Presented by Ben Gould, University of Saskatchewan

Rural/remote older adults (60+ years) described unmet needs, which provides opportunities for technology development. The sample of 621 was recruited from random telephone numbers (land line and cell), and was predominantly rural/remote (most from areas of fewer than 5,500 persons). Data from 502 participants who described a time they needed assistance were thematically analyzed. Most (307) described needing physical assistance due to strength / medical conditions; 66 needed help using technology; and fewer mentioned other limitations (e.g., due to an inability to drive). These data suggest technologies that augment physical tasks may assist rural/remote seniors, and underscores the need for intuitive technologies.

47. Unobtrusive Monitoring of Congestive Heart Failure

Presented by Madison Cohen-McFarlane, Carleton University

With aging comes increased susceptibility to disease and disability, variations in mental capacity and decreased functioning. Unobtrusive monitoring of at risk older adults can increase their safety, prevent hospitalizations and alert health care providers when an intervention is needed. Congestive heart failure (CHF) is very common in older adults and occurs when the heart is unable to sustain the necessary blood flow throughout the body leading to reduced kidney function and fluid retention. Current monitoring methods are based on weight variations due to this fluid retention. A pressure sensor system, placed between the mattress and bedframe, is being developed in order to alert the health care professional when fluid retention increases and replace current unreliable monitoring methods.

48. Usability evaluation of a novel wearable inertial sensor device to help older adults visualize and manage the risk of falling

Presented by Yusheng Wu, University of Toronto

We employ a novel wearable sensor to provide accessible measurement of the amount of physical activity for seniors, while assessing the risk of falling using gait quality. We are investigating the acceptability and effectiveness of this wearable sensor-based system in promoting activities and fall prevention practices. The accompanying mobile interface incorporates feedback from 5 target users, and the entire system is validated in-situ with 5 target users over 3 months. Successfully translating the advances in wearable and sensor technologies to health benefits for the elderly users can significantly improve older adult's quality of life and independent living.

49. Usability of a web-based consumer guideline for locator technologies: A literature review

Presented by Adriana Rios Rincón, University of Alberta

The number of consumer technologies for health application is increasing. These products typically have websites but they vary in completeness and usefulness. Thus, there is a need to measure attributes that influence perceived usefulness of product websites by end users. Caregivers of people with dementia may benefit from web-based consumer guidelines that provide consistent, relevant information about technologies used to manage behaviours. In our development of a web-based Consumer Guideline for Locator Technologies, we conducted a literature review of available approaches for evaluation of website attributes in order to assess their usability. Results of the literature review will be presented.

50. Use of digital storytelling with older adults: A literature review

Presented by Adriana Rios Rincón, University of Alberta

Digital storytelling involves the use of technology in the process of creating and telling stories, allowing stories to be preserved and shared with loved ones and future generations. With advances in technology, the use of digital storytelling has grown rapidly in recent years. Digital storytelling can be used in the form of reminiscence therapy in adults with dementia and as a means of life review and connectedness in older adults with typical aging. This literature review examines publications

pertaining to digital storytelling in older adults, discusses the types of research done, and suggests future directions.

51. User-centered game design for older adults (2 case studies)

Presented by Simone Hausknecht, Simon Fraser University

This poster looks at the initial phases of two studies in which we worked with two different media schools in Vancouver to design digital games for older adults. A user-centered design approach was utilized by which the needs, desires, and limitations of the end users were taken into consideration at all stages. Collaboration occurred among researchers, instructors, student-designers, and older adults to create several fun interactive learning games. The poster will describe the process, details of the three games that went through to completion, and some results of feedback from older adults throughout the process. As well, initial analysis of the focus group interviews of the teams and instructor will be reported from one of the studies. We are planning to go forward with further development of two of the games in collaboration with a game design company.

52. Using Participatory Design to Critique and Design Older Adults-Friendly and Culturally-Appropriate Communication System.

Presented by Xiaofeng Yong, McGill University

Communication is positively associated with the well being of older adults. However, most communication system designs are targeted at young people and are based on Western design principles. This paper adds to and extends existing work on older adults by examining how to design older adults-friendly communication systems with a more diverse set of older adults – non-native English speakers and non-Westerner. To inform the design of communication systems for older adults that will be appropriate for non-English speaker and non-Westerners, we ran several participatory design workshops where older adults of Asian background where they critiqued current communication systems, chose important functionalities, and build their own imagined older adults-friendly digital communication system. We consolidated their design and developed a real email communication system based on digital pen and paper technology.

Crosscutting Activities

CC1: A Knowledge-To-Action Framework for Assistive Technology with Older Adults

Presented by Karen Kobayashi, University of Victoria; Simon Carroll, University of Victoria

In order to develop a framework for knowledge mobilization, we conducted a rapid review of literature (Ganann, Ciliska & Thomas, 2010) relevant to mobilizing and translating knowledge generated in the field of gerontechnology, with the goal of facilitating more effective uptake of new assistive technologies by older adults, caregivers, health care practitioners, and policy/decision-makers. In particular, our intent was to provide a timely contribution to the ongoing program of research funded by AGEWELL. Although there have been several recent systematic reviews of knowledge translation, or the knowledge-to-action process (Grimshaw, Eccles, Lavis, Hill & Squires, 2012), there has been less attention paid to how this problem applies specifically to the development of innovative technology and its adoption by end-users (Lane & Flagg, 2010). In our review, we attempt to bring together the latest research on effective knowledge translation/mobilization processes, the application of this research to the development of innovative technologies, and insights into how the specific characteristics of older adults and caregivers as end users may affect the success of knowledge mobilization for assistive technologies. Our poster presents an emergent Knowledge-To-Action framework that builds on the previous adaptation of Lane and Flagg's (2010) process by focusing on older adults. Here, we present the framework along with a narrative explanation of its components.

CC2/CC3: Enhancing Aging and Technology Research Outcomes: A Transdisciplinary Approach towards Successful Commercialization in AGE-WELL

Presented by Mei Lan Fang, Simon Fraser University; Theresa Burley, Simon Fraser University

A globally aging population necessitates innovative approaches to ensure people across societies age well. This requires active attempts to understand the different problem spaces that exist within and between geographic locations concerning the everyday lives of older people with varied demographic profiles shaped by diverse cultural, social, economic and political characteristics. Whilst AGE-WELL, the Canadian National Centre of Excellence network on aging and technology, addresses a wide range of 'aging complexities' through technological innovations; without appropriate integration of commercialization strategies consistent with principles of transdisciplinarity, such outputs may result in little or no impact. To implement commercialization strategies effectively requires the synchronization of experiences and working practices of diverse members of the Network of Centres of Excellence network on aging and technology (e.g. scientists, engineers, clinicians, businesspeople, policymakers, older adults, and students). In order to commercialize products and services in such a complex area, it is important that AGE-WELL members work together to create new solutions to wicked problems. The aim of the AGE-WELL Innovation Workshop is to introduce and apply methods of transdisciplinary working, a nuanced, collective working approach for developing effective strategies to enhance knowledge mobilization and commercialization. This presentation demonstrates how Innovation Workshops developed under principles of transdisciplinarity enabled the development of commercialization strategies to improve research, training, knowledge mobilization and commercial outcomes.

CC3 T-WORK: Transdisciplinary Working

Presented by Alisa Grigorovich, University of Toronto

In our presentation we report on the activities of the CC3 team over the past year, and the progress that we have made to date. We have: 1) Begun recruitment for our longitudinal research study to explore network members' perspectives and experiences of transdisciplinary working; we have recruited 2 projects as case studies, and have additionally begun interviews with diverse network members; 2) In terms of understanding transdisciplinary working and its value within research and development of projects, we are in the final stages of a scoping review to characterize the evidence on the effectiveness of transdisciplinarity on research processes, outcomes and impacts; this will be finalized and submitted for publication by the end of this year; 3) We are also developing a new tool to guide self-reflection on transdisciplinarity called the Transdisciplinary Research Effectiveness in Aging and Technology (TREAT) scale, which can be used to guide future evaluation of transdisciplinarity within AGE-WELL and beyond. We have completed preliminary evaluations of the scale with network members, and revised it based on feedback; 4) We have developed a preliminary quality framework for evaluating the processes,

mechanisms and outcomes of transdisciplinarity across AGE-WELL projects; 5) We are developing a knowledge repository of transdisciplinary research articles to be archived on AGE-WELL's intranet; and 6) CC3 KT&E activities have included: innovation workshops (A Transdisciplinary Approach to Thinking Commercially) delivered across the country, the AGE-WELL Summer Institute, running a transdisciplinary journal club and online seminars on transdisciplinarity, and presentations at several national and international conferences.

CC4 TRAIN: Training and Mentorship

Presented by Euson Yeung, University of Toronto

The purpose of CC4 is to create value-added training initiatives to develop a new, dynamic cadre of transdisciplinary researchers and professionals in the field of technology and aging. Over the past year, we focused on building HQP capacity by emphasizing the development of skills, ideas, teamwork, and relationship-building that are the building blocks of a successful career through two key activities: 1) the launch of the EPIC (Early Professionals, Inspired Careers) training program and 2) the first annual AGE-WELL Summer Institute. Our ongoing evaluation of these programs employ customized surveys, observations and interviews to identify best practices in the development of transdisciplinary researchers and professionals and to determine the most relevant competencies to enable transdisciplinary and innovative research. Our future plans are to locate and synthesize relevant literature that will inform the development of best practices in training for transdisciplinary research, and to develop and apply an evidence-informed framework to our training programs.

1. A garment-based neuro-orthosis to help individuals with paralysis standing independently: design and preliminary results.

Presented by Bastien Moineau, Toronto Rehabilitation Institute

We are developing a novel wearable neuro-orthosis to assist individuals with neurological paralysis (stroke, spinal cord injury) to stand independently. In this demo session, we will present, with our industrial partner, the first prototypes of “electrical stockings” or “e-pants”. Those are an electrode-embedded garment that will generate muscle contractions by delivering electrical current through the skin. This new and unique technology can have different use that will be discussed with the attendees. In addition, we will showcase how we plan to use inertial sensors (gyroscopes combined with accelerometers) to track and control body motions in a real-time fashion.

2. Adaptable Intelligent Domestic Environments

Presented by Jyoti Joshi, University of Waterloo

Our objective is to design an affectively aware virtual assistant for elderly persons to assist them with activities of daily living. To make an assistive technology more efficient and to ensure uptake, it is critical to understand and react to the emotional state of a user during interaction with the system. To achieve this, facial expressions of users following prompts by a virtual assistant are captured with a camera. Low level facial features are computed and emotion inferences are performed based on the principles of Affect Control Theory. Emotions are integrated in the system's decisions using a Bayesian model to make it emotionally intelligent.

3. ATforCC Assistive Technologies that Care for the Caregiver: An App to Collect Existing Assistive Technologies (AT) for Caregivers

Presented by Mackenzie Martin, University of Alberta

This poster reports on the design and development of a digital tool called Innova. Innova is an app and database that collects information about and analyzes the functionality of assistive technologies (AT) available to family caregivers. The primary objective of Innova is to create a database that relays caregivers' perspectives on AT products/services to designers. Drawing designers' attention to caregivers' evaluations of AT will inform both the modification of existing AT designs and the creation of new AT solutions. Although Innova was created for designers, caregivers will have access to the database contents in a format conducive to their needs.

4. Closing the Gap to Technology Adoption: A Case Study of Older Adults with Mild Cognitive Impairment using the InTouch Communication Application at Home

Presented by Aaron Yurkewich, Toronto Rehabilitation Institute

We explore how InTouch, a tablet communication application designed for older adults, was adopted. Methods: 14 seniors, ten with Mild Cognitive Impairment (MCI), were paired with a student to learn and use InTouch for 12 weeks. Results: 12 participants completed the study, using the application to send 1212 messages. Text, audio, photo, and video features were used 705, 280, 143 and 84 times. Conclusions: Seniors view this simplified application as a valuable means to enhance communication with friends and family. With guided weekly support, seniors learned to use this technology independently and integrated its use into their daily lives.

5. Collision Avoidance and Feedback System

Presented by Pooja Viswanathan, University of Toronto

Powered mobility can offer increased independence and mobility to those who are unable to walk or to use manual wheelchairs. However, safety is a major factor in decision-making regarding provision of powered mobility devices. Older adults with a diagnosis of dementia are especially likely to be denied these devices since they often experience symptoms that make safe operation challenging or even impossible. Loss of mobility can in turn lead to depression and an increased reliance on caregivers. In order to address these issues, we have developed an add-on system that can transform any wheelchair into a smart wheelchair that automatically detects obstacles, offers

feedback to the driver, and helps prevent collisions. Our system can thus improve quality of life by increasing safety and independent mobility. We are currently commercialising this technology through a start-up, Braze Mobility Inc. (www.brazemobility.com).

6. CoPILOT Remote Tele-Operator for Powered Mobility Training

Presented by Emma Smith, University of British Columbia

Learning to drive a powered wheelchair can be difficult for older adults with cognitive or memory impairments. In consultation with clinicians and wheelchair users, we developed a remote tele-operation device (CoPILOT) and training program to address the needs of this population. CoPILOT allows a trainer to share control of the wheelchair with the learner to provide demonstration, error-correction, and graded learning activities. This allows the training to be individualized to the person's learning needs, promoting safety, and potentially reducing anxiety associated with learning. In this session, we will provide a demonstration of the CoPILOT remote control on a powered wheelchair.

7. Cyberwork Robotics Demo

Presented by Mathieu Labbé, Cyberwork Robotics

We present a prototype of an autonomous wheelchair using only low-cost sensors such as a Kinect v2 and wheel encoders, without the need of an expensive LiDAR. The demonstration consists of showing the visual-based mapping, localization, planning and 3D obstacles avoidance capabilities of the system. Beside seeing the actual wheelchair moving, the attendees will be also able to see what the wheelchair is sensing in real-time. The framework is based on ROS compliant Open Source projects, with everything integrated on a small onboard computer. The system is designed to be independent of the hardware, so transferable to any powered wheelchair.

8. FAB-Rehab: A Backup Camera System for Safe Navigation of Power Wheelchairs

Presented by Martin Gerdzhev, McGill University

In this demo we will be featuring a Backup Camera system integrated on the SmartWheeler platform. Our low-cost camera system can help any power wheelchair user effortlessly navigate backwards. Our Backup Camera lets the user see real-time video footage from the back of a wheelchair, so that they can navigate more safely. The camera can be mounted on any powered wheelchair and the video from the camera can be viewed via WiFi on any smart phone or tablet. For more information: <http://martingerdzhev.com/fabrehab/>

9. INTOCARE Website: Innovative Technology for Caregivers

Presented by Maude Beaudoin, Université Laval; and 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 complete two interviews. In the first interview we identify needs and in the second interview we discuss potential solutions. To identify potential solutions, we've created a website where participant 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.

10. Mapping Health and Aging Innovation

Presented by Heather McNeil, University of Waterloo

To contribute to the DRiVE project's goal of developing a Theory of Action for regional health innovation ecosystems, we are building out a global inventory & interactive map of innovation entities that focus on the health and aging sector. Through internet research and phone interviews we gathered information on their location, partnerships, specialties, regional characteristics and other features. We will demonstrate the map, and inventory to test usability and design with AGE-WELL conference registrants. This product will contribute to our KTEE initiative and lays the ground work for a survey of regional health innovation ecosystems to collect data to test our theoretical model.

11. Mobile Robotics for Activities of Daily Living Assistance Demo

Presented by Sébastien Laniel, Université de Sherbrooke

The demonstration involves a simple remote patient monitoring scenario using a beam+ robot platform with added computational and sensory capabilities (i.e., a Kinect sensor and a 8-microphone array). Basic teleoperation and 3D simultaneous localization and mapping capabilities will allow to plan a trajectory and guide the robot to specific locations. Using Bluetooth medical devices, vital signs are going to be taken by the person and displayed on the robot's user interface. The robot will change its orientation in the person's direction when speaking. The implementation is performed using ROS coupled with a robot control architecture, used as an integration framework.

12. Personalized, Kinect-guided Exercise for Seniors: Feasibility, Usability, and Impact on Cognitive-Decline Management

Presented by Victor Fernández, University of Alberta

Exercise enhances physical and mental health of seniors. Computer-guided exercise can support seniors to exercise in their homes and at their ability level, enabling them to adhere to their exercise regimen for a longer term. The K-Rehab family of exergames offers therapists a visual editor for specifying personalized exercise session, in terms of key postures and movements. Based on this specification, a personalized game is generated where a simulated coach avatar demonstrates the exercise. Finally, at run time, the game observes the individual with a Kinect sensor, analyzes movements, and provides feedback so that seniors can exercise correctly and safely.

13. SmartAssist: an online decision support system for the self-selection of assistive devices

Presented by Vanessa Chenel, Université de Montréal

Many older adults who experience changes in capacity are seeking advice about innovative solutions and assistive devices to make everyday activities as easy as possible. In Canada, getting an appointment with a professional to get such advice can be very long and complex. How could we accelerate the process by which older adults receive accurate advice about assistive devices? The decision support system called SmartAssist is an online tool designed to ask questions based on clinical reasoning. Depending on the answers, SmartAssist will give advice and, if needed, make recommendations for assistive devices. Will you come and try SmartAssist?

14. SteadiWear

Presented by Mark Elias, SteadiWear

SteadyWear inc. has developed an intelligent glove that adaptively reduces hand tremors in Essential tremor and Parkinson's disease. The Steadiglove uses cutting edge vibration damping technology to provide responsive stabilization to all patients with differing hand tremors. It is designed to be compact, lightweight, user friendly and battery free. It will help patients go about all daily activities with significantly less frustration leading to increased independence, improved quality of life and a reduction of ongoing healthcare costs.

15. The Centivizer: Managing Well-Being and Improving Status in Dementia

Presented by Andrea Wilkinson, University of Toronto

The Centivizer is a system for managing behaviour in people with dementia in long-term care (LTC). It provides reinforcement learning, using the back of the brain reward system, that remains for some time after dementia undermines the explicit memory and executive control systems. The current prototype consists of cognitive games played on a touchscreen, a lever for arm exercise, and a nickel dispenser for providing rewards. A website allows caregivers and LTC staff to track residents' performance, and define target activities, reward schedules. Our next step is to evaluate the impact of the Centivizer System on behaviours of dementia residents.

16. The PRI-TECH Policy Primer: Mapping AGE-WELL Innovation Pathways

Presented by Maggie MacNeil, University of Waterloo

PRI-TECH surveyed AGE-WELL project leaders to better understand their intended pathways to commercialization, and associated policy and regulatory facilitators and barriers. A policy primer summarizing a variety of legal and regulatory sources was developed to support innovators through stages of innovation, approval and adoption. Using the policy primer, work-package survey

responses, project descriptions and Health Canada's regulatory process, PRI-TECH mapped the innovation pathways for AGEWELL technology projects. PRI-TECH HQP will demo these pathways, including considerations for each stage of the process from research and development through licensing and regulatory approval, health technology assessment, reimbursement and procurement.

17. Virtual environment for designing a smart habitat

Presented by Damien Lockner,

The DIY-Aide project aims at offering caregivers an easy way to install a functional system that will assist their elder for aging at home. First, caregivers will have to identify what information from their elder's habits is required, following the guidance provided by the DIY-Aide system. Then, they will use a visual tool that will help them choose the domotic components and place them virtually in the environment. We demonstrate how caregivers will design a scenario of different ADL thanks to atomic actions with an augmented plan interface. This first step of specification of the cognitive assistance system will shift towards more user-friendly ways to register physical environment and ADL scenarios by the caregiver.

18. Western Ottawa Whack-a-Mole (WOW) Computer Game

Presented by Victor Guana, University of Alberta

WP 5.1 (AMBI-MON) and WP 6.2 (COG-ASSESS) have been working collaboratively this year to design and test a computer game targeting individuals with moderate dementia. The Western Ottawa Whack-a-Mole (WOW) application is part of the UAlberta's UniCog platform, which offers a variety of known games, redesigned for the purpose of cognitive assessment and training. It was developed in collaboration with Carleton U to measure inhibition and processing speed – two areas often affected by dementia. The tablet-based game is currently being field tested with older adults with dementia to assess its ability to support remote monitoring of cognition. For our interactive demonstration, our team members will give attendees an opportunity to try it!

AGE-WELL NCE Inc.
Toronto Rehab – UHN
550 University Avenue, 13th Floor
Toronto, Ontario M5G 2A2
CANADA

T / 416 597 3422, ext. 7778
E / info@agewell-nce.ca
www.agewell-nce.ca



Government of Canada
**Networks of Centres
of Excellence**

Gouvernement du Canada
**Réseaux de centres
d'excellence**