CONFERENCE PROGRAM
Welcome Message from AGE-WELL NCE

AGE-WELL NCE is Canada’s Technology and Aging Network. Since 2015, we have sought to create a network – to truly bring everyone together – in order to improve the lives of older Canadians and their caregivers. Our Highly Qualified Personnel (HQP) have been a key part of that process from the beginning and we are proud to see our alumni building and strengthening the AgeTech sector in Canada.

Over the next month, you will hear research presentations and you will read Twitter presentations from some of the brightest and best emerging researchers in the country. Presenters will be undergraduate students, graduate students, postdoctoral fellows, early career professionals, and research staff from institutions across Canada.

Engaging with our older adult and caregiver stakeholders has been fundamental to our network and to HQP training from the very beginning. Along with our HQP, we are excited to hear from the members of our Older Adult and Caregiver Advisory Committee who will share their experience and expertise with us as designated commentators for each oral presentation panel.

As we enter the second year of the COVID-19 pandemic, and the second year of the EPIC Conference, our vision for AGE-WELL rings true as a call to action: Canada’s leadership in technology and aging benefits the world.

Our HQP are the future of Canada’s AgeTech sector and we look forward to hearing from them in the EPIC Conference 2021.

Andrew Sixsmith,  
AGE-WELL Associate Scientific Director

Alex Mihailidis,  
AGE-WELL Scientific Director
Welcome Message from HQP-AC

On behalf of the AGE-WELL HQP Advisory Committee, we would like to thank all the AGE-WELL members for making the EPIC Conference 2021 possible. We recognized the tremendous effort you put together towards this great event.

As we mark more than one year since the start of the pandemic, we have seen substantial shifts in our daily lives. Despite the hardships so many of us have had to endure, we have become stronger and wiser together. While we all remain under restrictions as the toll of COVID-19 persists, we are honoured to continue to find opportunities for the HQP community to showcase their projects and ideas using social media and online platforms.

During this year’s EPIC conference, we will connect and interact with HQP, researchers, and stakeholders in an online environment, to discuss, exchange and pivot ideas around AGE-WELL’s 8 Challenge Areas and the future of AgeTech. We look forward to engaging with you over the next four weeks and invite you all to connect using the hashtag #AWepic2021.

Thank you to the HQP-AC members serving as EPIC Conference Steering Committee:

- Adina Panchea, Quebec Regional Representative
- Amel Yaddaden, Quebec Regional Representative
- Adebusola Adekoya, Ontario Regional Representative
- Erica Dove, Ontario Regional Representative
- Louise Castillo, West-Central Regional Representative
- Jon Lai, West-Central Regional Representative
- Jamie MacDonald, West-Central Regional Representative
- Aderonke Agboji, Pacific Regional Representative
- Karam Elabd, Pacific Regional Representative

As well, we would like to thank Samantha Sandassie, Senior Education and Training Manager and Alison Schneider, Education Coordinator at AGE-WELL, as well as Noelannah Neubauer and Shabnam Haghzare, our past HQP-AC Vice-president and President, for their guidance and support. We are confident that their commitment to this Advisory Committee paved the road for another successful conference.

Sincerely,

Hector Perez, President HQP-AC,
Isabelle Rash, Vice-President HQP-AC

Special thanks to Juliet Neun-Hornick for her work in creating the banner images for EPIC 2021.
How to Participate

The EPIC Conference (2021) is an opportunity for AGE-WELL HQP to share their research, highlight their potential impact, and connect with colleagues.

It will comprise of 8 virtual sessions, each dedicated to one of the identified challenge areas. Each session will involve 2 streams of presentations – a traditional oral presentation and a Twitter conference presentation. Additional sessions will include Workshop Wednesdays to build skills in networking, international collaboration, and navigating career path outside of the academy.

All are welcome to attend.

Live Twitter Presentations:

In this conference stream, HQP will be challenged to encapsulate their presentations into 5 pre-scheduled tweets at 12:00, 12:20, 12:40 PM ET (2:30, 2:50, 3:10 PM ET on June 1st). Twitter presenters will be online for an interactive Q&A Twitter session.

Follow the Twitter presenter’s handle and the hashtag #AWepic2021 to participate.

Live Crowdcast Presentations:

These sessions will be hosted on Crowdcast and comprise of an introduction to the challenge area presented by the session chair, 3 oral presentations, and a follow up comment by a stakeholder that places these presentations into the larger discourse and addresses potential research impact.

Register for all challenge area sessions on AGE-WELL’s Crowdcast page here. Once you are registered you may use the chat and post questions prior to the session. Use the ‘Ask a Question’ section to get your questions up-voted.

Check out Crowdcast’s reference guide here.

Live Workshops:

Every Wednesday in June, additional sessions will include networking workshops, a roundtable on finding a career outside of academia, a panel how to build equity in practice and an international panel discussing the future of AgeTech. Register for these sessions using the individual links on the workshop pages to follow.

Symposium de l’innovation AgeTech:

On June 29 and 30, AGE-WELL is hosting 8 sessions en français that highlight the research and innovation of our French-speaking trainees, ERCs, and investigators from across Canada. Register for these Zoom sessions using the individual links on the Symposium pages to follow.
Chair: Jeffrey Jutai, University of Ottawa

Commenter: Sherry Baker, Vice Chair, Older Adult and Caregiver Advisory Committee

Oral Presentations:
- Public health policy on technology for self-management of chronic disability by older adults
  Amélie Gauthier-beaupré, University of Ottawa
- Opportunities to evaluate supportive homes with human participants during a pandemic; integrating Design critique with the User-Center Design method
  Lorans Alabood, University of Calgary
- Trill - Continuing creative connectivity in care homes
  Richard Barham, Université Laval

Twitter Presentations #AWepic2021:

2:30 PM ET
What is the role of police after a missing person living with dementia is found and returned home? Perspectives of police services in Canada and Scotland
Lauren McLennan, University of Waterloo, @LaurenKMcLennan

2:50 PM ET
Acceptability and usability of smart home technologies and wearables to support discharge planning from a rehabilitation hospital
Andrew Chan, Glenrose Rehabilitation Hospital Research, @AndyChanYEG

3:10 PM ET
Return home interviews for missing older adults living with dementia: A scoping review
Elyse Letts, University of Waterloo, @ElyseLettts
EPIC Conference 2021 Workshop:
Fearless Networking in the time of COVID

June 2, 2021 @ 1:00 – 2:00 PM ET

Speaker: Jean Chow
Coach, Mentor, Instructor
@MsBizWiz

#AWepic2021

REGISTER HERE

Learn how to shift to a positive mindset about networking. Being able to connect with the right person at the right time for the right reasons is a valued skill to help build authentic relationships. In this high-touch and fast-paced experiential workshop, you’ll learn to approach networking with excitement, curiosity, and an open mind and discover how meeting new people can help you reach your career and life goals.

You will learn:

• To create favourable first impressions.
• Why perspective-taking is essential.
• How small talk is big.
• To build rapport rapidly.
• More great tips on building and maintaining a select and diverse network.

Speaker:

Jean Chow teaches “Hacking the Networking Code” as a part-time Sessional Lecturer at University of Toronto Faculty of Medicine, Translational Research Program and “Fearless Networking” as an Instructor at the School of Continuing Studies. She also teaches skill-building courses in leadership and advanced career management at Ryerson University and Seneca College respectively.

Jean owns a business and career coaching practice and is aptly known on social media as @MsBizWiz. Her past roles include: Mentorship Specialist, Entrepreneur-in-Residence at the Toronto Public Library, and Inventor of an Asian DIY Dinner Kits and Founder of a wholesale specialty food manufacturing business.

As a Super Connector, Jean believes strongly in how “one thought, one word, one action can reduce another’s suffering” to build a better and kinder world. She is also the recipient of the Queen Elizabeth II Diamond Jubilee Medal for her contribution as a volunteer business mentor for young entrepreneurs.

Jean is determined to not let a pandemic stop her from living the life of a digital nomad.
Chair: Don Juzwishin, University of Victoria

Commenter: Olive Bryanton, Atlantic Region Representative, Older Adult and Caregiver Advisory Committee

Oral Presentations:

- **Stakeholder informed revision of the Health App Review tool**
  Julie Faieta, Laval University

- **Usability of a smart technology-based adherence product in older adults**
  Sadaf Faisal, University of Waterloo

- **Co-creating a collective vision for mental wellness with urban Indigenous communities**
  Viviane Josewski, University of British Columbia

Twitter Presentations #AWepic2021:

12:00 PM ET
**Mindful Garden digital intervention in the management of hyperactive delirium**
Michelle Nicholas, Simon Fraser University, @roundtoit

12:20 PM ET
**Indoor location data for tracking health-related human behaviour patterns: A scoping review**
Leia Shum, Toronto Rehab Institute, University Health Network, @leia_shum

12:40 PM ET
**Supporting scalable development of serious games BrainTagger researcher platform:**
Supporting scalable development of serious games for cognitive assessment
Bella Yigong Zhang, University of Toronto, @BellaZhang810
Chair: Lili Liu, University of Waterloo

Commenter: Caron Leid, Vice-Chair, Older Adult and Caregiver Advisory Committee

Oral Presentations:

- **Supporting autonomy, independence, and safety through locator devices for persons living with dementia**
  Noelannah Neubauer and Serrina Philip, University of Waterloo

- **MOvIT+: Pre-validation of monitoring the usage of powered wheelchairs with the MOvIT+ platform**
  Adrien Pajon, Center for Interdisciplinary Research in Rehabilitation and Social Integration (CIRRIS)

- **Can intelligent powered wheelchairs be controlled by low-cost brain-computer interfaces?**
  Adina Panchea, University of Sherbrooke

Twitter Presentations #AWepic2021:

- **12:00 PM ET**
  Semi-autonomous electrical stimulation therapy for diabetic skin wounds
  Reza Basiri, University of Toronto – Toronto Rehab Institute, @90reza

- **12:20 PM ET**
  The risk of going missing in persons living with dementia: A scoping review
  Hector Perez, University of Waterloo, @hectorpl

- **12:40 PM ET**
  Evaluation of a person-centred care assessment tool for older adults with complex needs in a long-term care setting
  Carlee MacNeill, Dalhousie University, @CarleeMac1
Entering the job market outside of academia can feel unfamiliar if academia is all you’ve known. How do postdocs and other graduate degree holders find fulfilling work that makes a positive impact and pays the bills? This panel will cover how to know what kind of work is right for you, find relevant opportunities, and translate your experiences into compelling application materials. Plus, why and how to network, even if you’re an introvert.

Panelists:

**Sandra McKay**, PhD, MBA, is the Vice President, Research & Innovation at VHA Home HealthCare. Under her leadership, key partnerships with universities, hospitals, start-ups and the private sector have been established to build and share programs of research across the organization. She has created a space where business and research connect each day allowing amazing people to pursue meaningful improvements for clients, families and providers.

**Usha Srinivasan**, PhD, is the Director of the Ryerson Venture Zone (Brampton). A strategic innovation leader, collaborative community builder, and entrepreneurship maven, Usha was responsible for building MaRS entrepreneurship programming in her former role as Vice President, Venture and Talent. She has recently taken on the challenge of building and scaling the Ryerson Venture Zone (Brampton) launched in 2020 and looks forward to coaching entrepreneurs and scaling businesses to solve local challenges.

**Arjun Puri** is Cofounder & Chief Technology Officer at Luxsonic. His experiences have translated to deep expertise in digital health innovation and user-centered solutions. He cofounded Luxsonic Technologies to help organizations improve access to health care services through immersive technologies like VR, AR and XR. Arjun received his MSc in Health Systems and Public Health from the University of Waterloo and has over a decade of experience in health technology innovation, assessment, and management.

**Moderator: Jennifer Polk**, PhD, is a career coach and consultant. She launched From PhD to Life, a career coaching and speaking business, in 2013, and later co-founded Beyond the Professoriate, a business she left in January 2020. Jen speaks on university campuses and at academic and professional conferences. Her University Affairs blog is a three-time gold winner from the Canadian Online Publishing Awards. More recently, she was an expert panelist for the 2021 Canadian Council of Academies report, Degrees of Success, on the challenges PhDs face transitioning to employment. Jen earned her PhD in history from the University of Toronto.
Chair: Frank Knoefel, Bruyère Research Institute

Commenter: Jim Mann, AGE-WELL NCE Research Management Committee

Oral Presentations:

- **Determinants of behavioral intentions to use an automated pain behaviour monitoring system for long-term care: A mixed-methods pre-implementation study**
  Natasha Gallant, University of Regina

- **Patterns of acceptance and adoption of assistive technology among cognitively impaired visible minority older adults (VMOA) in Canada**
  Isaac Adedeji, Simon Fraser University

- **Home sensor platform and opportunities**
  Laura Ault, Bruyère Research Institute

Twitter Presentations #AWepic2021:

**12:00 PM ET**

Detection of behavioural symptoms in dementia using personalized machine learning models and multimodal sensor data
Sofija Spasojevic, University of Toronto, @SofijaSpas

**12:20 PM ET**

Do computers know whether older adults are engaged while playing mobile games?
Melika Torabgar, University of Alberta, @melika_torabgar

**12:40 PM ET**

Using cognitive executive function training and virtual reality simulations to reduce falls risk in older adults with hearing loss
Niroshica Mohanathas, Toronto Rehab Institute / University of Toronto, @niro_mohann
Mobility and Transportation
Tuesday, June 15
1:00 – 2:30 PM ET
#AWepic2021

REGISTER HERE

Chair: Jennifer Campos, KITE - Toronto Rehab Institute
Commenter: Ron Beleno, Co-Chair, Older Adult and Caregiver Advisory Committee

Oral Presentations:
- Exploring movement confidence among people with dementia and mild cognitive impairment during a motion-based technology intervention
  Erica Dove, University of Toronto
- The influence of cognitive ability on older adults’ ability to take over driving control from an automated vehicle
  Shabnam Haghzare, University of Toronto / Toronto Rehab Institute
- A witness seminar on community alert systems for missing older adults
  Adebusola Adekoya, University of Waterloo

Twitter Presentations #AWepic2021:

12:00 PM ET
The future of aging: Using low-cost wearables to monitor mobility in seniors
Denesh Peranakumar, McMaster University, @denesh24_kumar

12:20 PM ET
Intelligent Powered Wheelchair for users and their caregivers: an overview
Nathalie Todam Nguepnang, University of Montreal, @NathalieTodam

12:40 PM ET
Compensatory stepping responses during real-life falls in older adults
Bianca Te, Simon Fraser University, @biancaate
Join us for an AGE-WELL and NHSA co-hosted session on the future of the AgeTech sector. This session will cover opportunities in AgeTech globally as a field, opportunities in designing for older adults, and the skills and competencies trainees and ERCs must develop to be successful in the AgeTech sector. We will feature short talks from our panelists, with a moderated Q&A to follow.

Panelists:

Andrew Sixsmith, PhD, is the Associate Scientific Director of AGE-WELL NCE, Director of the SFU STAR (Science and Technology for Aging Research) Institute, and a professor in the SFU Gerontology department. He is past President of the International Society of Gerontechnology and was previously Director of the Gerontology Research Centre and Deputy Director of the IRMACS Centre at SFU.

Lee Omar, Ninja & Safe Steps, Founder/CEO. Lee harnesses the power of data to empower people to live their best 100 year lives. They do this through the Safe Steps Digital Care Platform that ensures the Right Data is acted on at the Right Time to provide the Right Care and health services to empower us to Age Well. Safe Steps digital health products reduce falls by 28% and connect care home residents with GPs in real-time to manage COVID. He is an expert in Artificial Intelligence for Digital Health apps.

Dr. Lynne Corner is Director of Engagement, Faculty of Medical Sciences, Newcastle University. She leads for Voice North - a large organisation established to harness the insights and experience of the public for research and innovation. She also leads for Patient Involvement for the NIHR Newcastle Biomedical Research Centre and is a member of INVOLVE.

Moderator: Dr. Aaron Yurkewich’s current focus at Imperial College London is in creating networks that bring multiple stakeholders together in the technology ideation phase and supporting these projects as they progress to commercialization. His PhD work at the University of Toronto / Toronto Rehabilitation Institute focussed on the development and evaluation of an open-source, lightweight and easy-to-use robotic ‘HERO Glove’ that enables individuals with hand impairment to extend their hand and grip with more force.
In this panel discussion, we hope to draw on the personal and professional experiences of leading researchers/clinicians who have been recognized for their advocacy on topics of EDAI. Our goals for the session are to support learners to:

1. Recognize signs of a non-inclusive and inequitable working environment for self/peers both on an individual or systemic level;
2. Learn to be a better ally or advocate for those facing obstacles such as, but not limited to, women, Indigenous peoples, individuals with disabilities, members of visible minorities/racialized groups, and members of LGBTQ2+ communities, and
3. Challenge current systemic biases to better include, maximize retention of marginalized groups in STEM.

Panelists:

**Dr. Carrie Bourassa**, B.A., M.A., PhD is the Scientific Director of the Canadian Institutes of Health Research – Institute of Indigenous Peoples’ Health (CIHR-IIPH) and a Professor, Community Health & Epidemiology, University of Saskatchewan. She is the Principal Investigator for the Canada Foundation for Innovation funded Morning Star Lodge as well as the Cultural Safety, Evaluation, Training and Research lab.

**Dr. Nicole Kaniki**, PhD is the Director of Equity, Diversity and Inclusion in Research and Innovation at the University of Toronto. She recently joined UofT in May, where in her previous role she was the Special Advisor on Anti-racism to the President at Western University and also worked in EDI in Research Development at Western. Dr. Kaniki holds a Masters in Kinesiology, a PhD in Health and Rehabilitation Sciences. She recently rounded up her expertise in EDI by completing a Masters in Women’s Studies and Feminist Research also at Western. She is passionate about social justice and uses an Anti-racism and Decolonizing lens in her work in EDI.

**Dr. Nicole Woods** is a cognitive psychologist who received her PhD at McMaster University (2005). Her work examines the role of basic science knowledge in clinical reasoning and the development of medical expertise. Applying principles of memory and human cognition to education across the health professions, her research program focuses on the mental representation of categories and instructional design that supports cognitive integration of basic and clinical sciences.

**Moderator: Dr. Azadeh Yadollahi**, PhD is the Canada Research Chair (Tier 2) in Cardiorespiratory Engineering. She is an Associate Professor at the Institute of Biomedical Engineering at University of Toronto, a scientist at KITE, and an adjunct faculty member in Biomedical Engineering Graduate Program at University of Manitoba. Azadeh is a strong advocate for inclusion, diversity, equity, and accessibility in STEM. She is the chair of “Inclusion, Diversity, Equity and Accessibility Committee” at University Health Network.
Healthy Lifestyles and Wellness
Thursday, June 17
1:00 – 2:30 PM ET

REGISTER HERE

Chair: Andrew Sixsmith, Simon Fraser University

Commenter: G Burn Evans, West-Central Region Representative, Older Adult and Caregiver Advisory Committee

Oral Presentations:

- Engaging Indigenous older adults with technology use to respond to health and wellbeing concerns and needs
  Cari Mcilduff, University of Saskatchewan

- Association between falls, head impacts and mortality among older adults in long-term care
  Mackenzie Heidel, Simon Fraser University

- Virtual Gym: Serious game platform to personalize physical activity
  Victor Fernandez, University of Alberta

Twitter Presentations #AWepic2021:

12:00 PM ET
Technology acceptance in theories of aging and technology
Marjan Hosseini, University of Ottawa, @HosseiniMarjan1

12:20 PM ET
Introducing new technology to monitor the health data of older adults with multimorbidities related to dementia in Indigenous communities
Meghan Chapados and John Bosco Acharibasam, University of Saskatchewan, @Meghan_MSL

12:40 PM ET
Mainstream tablet apps for older adults: Testing usability and accessibility
Yoobin Cho, University of Toronto, @yoobincho
REGISTER HERE

Chair: Arlene Astell, KITE – Toronto Rehab Institute

Commenter: John Hamblin, Advisor, Smart Technology to Support Seniors

Oral Presentations:
- Let’s Connect: Promoting meaningful experiences through touchscreen tablet games for people with dementia in a formal care setting
  María Acenas, Toronto Rehab Institute, University Health Network

- Engagement detection from videos through affective and behavioral state analysis
  Ali Abedi, Toronto Rehab Institute, University Health Network

- Robo Ludens: designing games for social robots to foster older adults wellbeing
  John Munoz, University of Waterloo

Twitter Presentations #AWepic2021:

12:00 PM ET
The CONNECTORS Project: Facilitating Social Connectedness with Seniors
Carly Thrower, University of Toronto, @CarlyMThrower

12:20 PM ET
Relationships between Cognitive Status and Loneliness During COVID-19
You Zhi Hu, University of Toronto, @youzhi_hu

12:40 PM ET
Exploring factors associated with distress in community-dwelling older adults during the COVID-19 pandemic: A mixed methods study
Nicholas Dietrich, McMaster University, @NickDietrich_
Join the Dream Network Drop-In to practice your networking skills and meet new people with big dreams.

The Dream Network Drop-in is a fun and free speed-networking event held once a month for 90 minutes by invite only. Meet with a highly diverse group (400+ members) of professionals, soon-to-be and recent graduates, early to mid-careerists, and adult learners who gather to meet new people and practice networking.

Host:
The Dream Network Drop-in started out as a “social experiment” by Jean Chow, University of Toronto School of Continuing Studies “Fearless Networking” Instructor after her first workshop. What was needed was a safe space for her adult learners to practice networking so the Dream Network Drop-in was created and then launched on April 28, 2018.

Jean teaches “Hacking the Networking Code” as a part-time Sessional Lecturer at University of Toronto Faculty of Medicine, Translational Research. She also teaches skill-building courses in leadership and advanced career management at Ryerson University and Seneca College respectively.

To register, email Jean Chow: info@msbizwiz.com
Financial Wellness and Employment

Thursday, June 24
1:00 ~ 2:30 PM ET

REGISTER HERE

Chair: Josephine McMurray, Wilfrid Laurier University

Commenter: Lisa Poole, West-Central Region Representative, Older Adult and Caregiver Advisory Committee

Oral Presentations:

- Employment barriers and facilitators for older workers and older job seekers: A scoping review
  Jonathan Lai, University of Alberta

- Too many caring demands?: Educational and employment consequences can lead to precarious financial situations and poor financial well-being for young carer
  Jamie MacDonald, University of Alberta

- Open: A Collaborative Learning Platform for Older Adults with Cognitive Disabilities and HQP
  Fatoumata Bah, University of Ottawa
Le souhait de rester dans le domicile de son choix est celui rapporté par un grand nombre de personnes âgées. Les technologies peuvent offrir des moyens innovants de soutenir ce souhait, notamment en permettant aux habitations et communautés d’être intelligentes. Cette session présentera une diversité de projets dans le domaine des environnements intelligents, couvrant le spectre de la recherche mais aussi de l'entrepreneuriat dans le domaine.

**Mots de bienvenue** : **Claudine Auger**, Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain (CRIR)

Modérateur : **Mohamed Abdelhafid Kadri**, Université du Québec à Chicoutimi

Présentations :

**Exploration d'une multitude de capteurs pour la reconnaissance d'activités dans les habitats intelligents**  
Sébastien Gaboury et Kevin Bouchard, Université du Québec à Chicoutimi

**De la recherche à la mise en œuvre d'une coopérative de solidarité**  
Sylvain Giroux et Hélène Pigot, Université de Sherbrooke

**Comment fiabiliser l'architecture d'habitat intelligent actuellement proposée par le LIARA et généraliser son fonctionnement pour s'adapter aux technologies émergentes**  
Florentin Thullier, Université du Québec à Chicoutimi

**Vers une interaction système-résident adaptative pour l'assistance cognitive à la réalisation des activités quotidiennes dans une maison connectée**  
Armel Ayimdji Tekemetieu, Université de Sherbrooke
Un diplôme d'études supérieures peut vous préparer à une multitude de carrières futures, en plus d'une carrière académique. Au cours de cette table ronde, vous aurez l'occasion d'écouter trois professionnels travaillant dans le domaine de la santé, au sens large, et d'en savoir plus sur leur parcours professionnel et les nombreuses possibilités d'emploi en dehors du monde universitaire. Les participants auront l'occasion de poser des questions pendant la session.

Modérateur : Bastien Moineau, Myant Inc.

Panel :

Josianne Crête, CIUSSS du Centre-Sud-de-l'Île-de-Montréal

Sabrina Boutin, Canadian Red Cross

Rostom Mabrouk, Synergie médicale
Les robots d’assistance sociale (RAS) peuvent fournir une assistance unique à court ou à long terme aux utilisateurs grâce à l’interaction sociale. Une grande variété de RAS pour les soins aux personnes âgées ont été conçus, testés et évalués, et même s’ils démontrent un grand potentiel, ils sont encore que des projets de recherche. C’est pourquoi le but de cet atelier est de présenter : (a) des solutions envisagées en termes de RAS, (b) la stratégie adoptée lors de déploiement des RAS dans les résidences pour les personnes âgées, et (c) une architecture de micro-services, dénommées OpenTera, comme plateforme technologique pour accompagner les personnes âgées ainsi que le personnel de la santé vers des déploiements des RAS à long terme.

Présentations :

François Michaud, Université de Sherbrooke

Adina Panchea, Université de Sherbrooke

Dominic Létourneau, Université de Sherbrooke
Rejoignez-nous pour une conversation stimulante et passionnante sur la santé cognitive et la démence. Écoutez des chercheurs et des cliniciens du domaine discuter 1) des possibilités offertes par la technologie pour améliorer la qualité de vie des personnes concernées et 2) de ce qu'ils pensent être les prochaines grandes avancées de l'AgeTech.

Modérateur : Arnaud Boujut, CRIUGM
Panel :

Yves Joanette, Université de Montréal

Alexander Moreno, Université de Montréal

Frank Knoefel, Bruyère Research Institute
Depuis de nombreuses années, la question du transport demeure une préoccupation importante chez les aînés, incluant la mobilité aussi par . Le transport et la mobilité facilitent l'accès à la communauté et la participation sociale des personnes âgées. Cette session fera émerger une réflexion ensemble sur une optique de « vieillir mobile » à partir de synergies possibles et des solutions concertées et transférables dans la réalité du transport, sécurité routière par un réseau d'acteurs mobilisés pour le mieux-être des aînés.

Modérateur : François Routhier, Cirris/ Université Laval

Présentations :

**Mobilité, Sécurité routière et Vieillissement: peuvent-ils faire bonne route ensemble ?**
Martin Lavallière, Université du Québec à Chicoutimi

**Perceptions et expériences des aînés avec le transport en commun suivant une formation à l'accompagnement (TanGo) : une étude qualitative**
Maxime Kiki, Cirris/ Université Laval

**Les radars de recul peuvent améliorer la sécurité des utilisateurs de fauteuil roulant motorisé (FRMot)**
Alice Pellichero, Université Laval
L'exercice est un médicament ! Rejoignez des chercheurs et des étudiants pour découvrir de nouvelles applications de la technologie pour améliorer le bien-être et la qualité de vie des personnes âgées. Nous écouterons des chercheurs, des étudiants et des usagers parler de comment la technologie a facilité leur engagement dans des modes de vie sains. Les avantages accrus de la technologie pendant la pandémie seront mis en évidence.

Modérateur : Nolwenn Lapierre, Hôpitaux Universitaires Pitié Salpêtrière - Charles Foix

Présentations :

L'activité physique adaptée via les technologies web pour prévenir les déclins physiques en contexte de pandémie (Covid-19) chez les aînés inactifs et vivant à domicile
Mylène Aubertin, Université du Québec à Montréal

Quelle est la modalité d'activité physique web permettant de mettre en action et de prévenir la santé physique des aînés isolés de façon optimale ?
Jordan Granet, Université du Québec à Montréal

La technologie web un allier pour évaluer à distance la santé physique des aînés non-fragiles et vivant à domicile ?
Eva Peyrusqué, Université du Québec à Montréal

TBA

Marie-Andrée Gagnon, Cirris/ Université Laval
Le contexte de pandémie a fait ressortir des lacunes importantes au niveau de la qualité de vie des aînés. Plus particulièrement, l’isolement social et le manque de contacts sociaux sont des enjeux cruciaux qui ont des impacts directs sur la santé mentale de cette population ainsi que de leur fonctionnement au quotidien. Ainsi, plusieurs solutions innovantes sont proposées pour pallier cette problématique et ainsi permettre le maintien de liens sociaux.

Modérateur : Amel Yaddaden, Université de Montréal

Présentations :

Simone Gamm, CISSS de Laval, Université de Montréal

Belkacem Chikhaoui, Université de Sherbrooke
Open : une plateforme de co-apprentissage entre stagiaires et personnes vieillissantes en situation de handicap cognitif

Open Collaboration pour l’accessibilité cognitive est une entreprise sociale qui embauche des personnes en situation de handicap cognitif en tant que conseillers pour tester et améliorer l’accessibilité cognitive dans la vie de tous les jours. Nos personnes hautement qualifiées (PHQ) bénéficient d’opportunités d’apprentissage expérientiel. Ils travaillent côte à côte avec des personnes de tous âges en situation de handicap cognitive.

Panel :
- Virginie Cobigo, Université d’Ottawa
- Fatoumata Bah, Université d’Ottawa
- Duncan Hladik, Université d’Ottawa
- Martine Lagacé, Université d’Ottawa
- Danika Lévesque, Université d’Ottawa

Mots de clôture : Sylvain Moreno, Le Centre Digital Health Circle
ABSTRACTS (alphabetical)

Engagement detection from videos through affective and behavioral state analysis Ali Abedi, Toronto Rehab Institute, University Health Network

Telerehabilitation (TR) substitutes the traditional face-to-face approach and allows for the treatment of acute phases of diseases remotely. The ongoing COVID-19 pandemic has further highlighted its importance; however, it also presents unique challenges in terms of engaging patients, therapy compliance and their dropout rates. In this work, we focus on the automatic detection of user engagement from videos. We formulate determining engagement from video interactions as a Spatio-temporal machine learning problem. It is further postulated the user engagement could be determined by peoples’ affective (e.g., emotional and facial analysis) and behavioral states (e.g., body movement). There exists no publicly available data to demonstrate user engagement in the TR space; therefore, we present the analysis on two datasets for online student learning (DAiSEE and EmotiW). Firstly, we extract affective and behavioral features, including a person’s valence, arousal, facial landmarks, eye blink, eye gaze direction, and head pose. Then, these features are fed to different types of neural networks, including Temporal Convolutional Networks and Long Short-Term Memory. Our experiments show an accuracy of 63.3 on DAiSEE and a mean squared error of 0.0673 on EmotiW datasets. These are the best result in comparison to other approaches on these datasets and shows the importance of affective and behavioral states in determining user engagement. This analysis can be easily adapted to TR programs, such as virtual cardiac rehabilitation. We will be collecting the video data on real patients enrolled in the virtual cardiac rehabilitation program to demonstrate the efficacy of this approach.

Let’s connect: Promoting meaningful experiences through touchscreen tablet games for people with dementia in a formal care setting Maria Acenas, Toronto Rehab Institute/The KITE Research Institute at University Health Network

Let’s Connect is a training program for staff and volunteers to introduce tablet games to people living with dementia to promote meaningful activity and quality of life. This mixed methods study conducted at adult day programs and long-term care facilities examines the impact of Let’s Connect for people with dementia. Fifty-seven individuals with dementia were video-recorded playing tablet games with staff and volunteers at the initial and final sessions of an 8-session program. Clients also completed the Quality of Life in Alzheimer’s Disease (QoL-AD) scale at pre- and post-participation. Video data were evaluated using ObserverTM behavioral analysis software with a coding scheme developed to examine engagement in meaningful activity. Pre- and post- comparison of clients’ QoL-AD revealed that participants’ quality of life was relatively high at the start and did not significantly change over time. Video data showed a decrease in gameplay prompts, incorrect movements, and dialogue with others, and an increase in dialogue with self. Collectively, these changes demonstrate understanding and constructive engagement with the games, and decreasing need for assistance from staff and volunteers. This study demonstrates both the feasibility of training formal caregivers to support people with dementia to use tablets and the impact of touchscreen games for people living with dementia and. The Let’s Connect training model could potentially be used to
teach people to use other apps and devices.

Patterns of acceptance and adoption of assistive technology among cognitively impaired Visible Minority Older Adults (VMOA) in Canada Isaac Adedeji, Simon Fraser University

Evidence is scant about the patterns of dementia incidence among VMOAs in Canada. There are systemic (racism in the health systems, socio-economic inequalities, funding), and cultural (language barriers, and access to culturally safe and appropriate care) challenges which make it less likely for minorities to seek and receive dementia care services. Thus, the research explores the social and cultural factors which underlie assistive technologies (AT) acceptance and adoption among cognitively impaired VMOAs in Canada. The research design is exploratory and adopts the social constructionist qualitative tradition. Methods of data collection include dyadic interviews and direct observation. VMOAs and caregivers from each visible minority group will be selected based on a range of social, demographic, and practice variables. The sampling procedure will start from stratifying British Columbia and identifying locations where there are concentrations of South Asians, Chinese, and Filipinos. Data validity and rigor will be assured across multiple stages of the research. Through the stage of content analysis on Atlas Ti, in the Kantian tradition, a priori and a posteriori codes will be stored on the code manager to content-analyze to quotations in the narratives. The study will bridge the knowledge gap regarding the mental health of VMOAs in Canada. The analysis of the cost-effectiveness of ATs within social class structures (employment status, education, income, digital divide, health insurance, and government support programs) among the VMOAs will be useful in developing dynamic health policies and financing frameworks to incorporate the cost of ATs into health insurance and public funding.

A witness seminar on community alert systems for missing older adults Adebusola (Busola) Adekoya, University of Waterloo

Background: The number of people who go missing due to dementia-related wandering is increasing. In 2019, a national petition for Silver Alerts for missing older adults was presented to the House of Commons. In response, the Government of Canada delegated the responsibility for alert systems to individual provinces. Aims: We coordinated an online national forum on the feasibility of implementing a "made in Canada" alert systems for missing older Canadians. Our research questions were: 1) What are the factors to consider when developing alert systems for missing older adults? 2) What is the feasibility of developing alert systems? Methods: A three-hour national forum was held via Zoom videoconferencing and followed the format of a Witness Seminar. Witness Seminars create oral history by bringing together thought leaders to discuss selected topics. Ten thought leaders, including persons with lived experience, first responders, community organizations, policy makers, and researchers from Canada, the United States, and the United Kingdom shared their perspectives on the feasibility of implementing community alert systems in Canada followed by Question-and-Answer sessions with public attendees, and a facilitated discussion. The forum was recorded and transcripts from the proceedings were analyzed for key themes and developed into a public policy brief. Results: There is an expressed need for community alert systems. Key considerations for implementation include privacy issues and alert fatigue. For effective implementation of community alert systems in Canada, we need a collaborative approach to engage all stakeholders and address concerns about provincial and national privacy legislations and alert fatigue.
**Opportunities to evaluate supportive homes with human participants during a pandemic; integrating design critique with the user-center design method** Lorans Alabood, University of Calgary

In our study, we design a smart home system prototype to support aging in place for seniors with dementias by integrating commercially available IoT devices and a Mixed Reality headset. Several studies highlighted the importance of following a User-Centered Design (UCD) approach when designing technologies for the aging populations. The UCD process includes evaluating the design of the system prototype with stakeholders. However, conducting this type of evaluations is not always possible. For instance, due to the COVID-19 pandemic, evaluating assistive technologies with senior citizens became very difficult due to the risk involved in meeting seniors in person. In this presentation, we integrate an alternative method of technology design evaluation called Design Critique into the typical UCD process. The Design Critique method is widely used in the fields of architecture design and engineering. In our case, we have recorded first person perspective videos of our system prototype presenting the entire user experience of completing daily tasks using our suggested smart home system. We present these videos over the web to stakeholders to collect feedback and iterate our design. We document the whole process in order to find common patterns and learn more about the special requirements of designing smart homes to support aging in place for seniors with dementia.

**Home sensor platform and opportunities** Laura Ault, Bruyere Research Institute

In a virtual and remote world, it is more important now than ever to understand the abilities of home sensing technologies. They can provide support to aging adults with cognitive impairment, and their care providers. Changes in cognitive impairment can be difficult to detect with episodic tests and questionnaires, however changes in activities of daily living may be indicators that cognition levels are declining. Sensors that can collect and analyze daily activity patterns can provide insight into a person's cognitive health over a longer period of time. This gives more information than the current method of cognitive testing, allowing changes and trends to be seen longitudinally, rather than episodically. These sensors also have the ability to return their collected data in the form of a status report which can be shared with care providers, both in and out of the home. This can provide insight on both the person living with cognitive impairment, but also the stress and burden their care provider may be experiencing. Current methods for care providers to report their stress and burden levels include self-report questionnaires and daily diaries, both of which add to the burden levels, and require time that may not be available. Sensor technology also opens possibilities for other types sensors to be added and removed throughout the home, customizing the information collected based on the person and family needs, all while providing support at a distance. This makes sensing platforms appealing for all levels of cognition.

**Vers une interaction système-résident adaptative pour l’assistance cognitive à la réalisation des activités quotidiennes dans une maison connectée** Armel Ayimdji, Tekemetieu, Université de Sherbrooke

L’assistance verbale en réadaptation cognitive se présente comme une interaction aidant-aidé où la personne aidante donne des indications verbales visant à provoquer un comportement approprié chez la personne aidée. Pour favoriser l’indépendance des personnes ayant des troubles cognitifs, les maisons connectées entendent automatiser cette assistance en offrant une interaction système-résident.
Cependant, l’automatisation expose au risque que le système « pense » en lieu et place du résident, s’écartant ainsi des principes de la réadaptation cognitive. Notre objectif est de construire une interaction système-résident lors duquel le système renforce les capacités du résident de la maison connectée en délivrant des messages d’assistance qui l’encouragent à agir de façon indépendante au meilleur de ses capacités. Nous présenterons une approche interdisciplinaire permettant de développer des actes d’assistance automatisés basés d’une part sur des données cliniques issues d’interventions d’ergothérapeutes et d’autre part sur l’ingénierie des connaissances et l’aide à la décision pour modéliser l’interaction système-résident en termes de messages d’assistance adaptatifs et de comportements attendus chez le résident. Nous présenterons plus spécifiquement l’applicabilité et l’utilisabilité du modèle système-résident pour sécuriser une cuisinière destinée aux personnes ayant des déficits cognitifs dus à un traumatisme craniocérébral.

**Trill - Continuing creative connectivity in care homes** *Richard Barham, Université Laval*

An AGE-WELL Catalyst initiative recently explored digital technology to support collaborative music-making in a care home. The Soundbeam system and Apple iPads successfully showed that digital technology, by translating simple hand gestures into musical notes, can enhance the lives of seniors with diverse cognitive and physical challenges. The project was cut short by the pandemic and seniors have been isolated from these creative activities ever since. Many care homes have not even caught up with basic virtual communication, let alone creative needs of residents. Staff are overloaded and unable to cope with the technical complexities required. It is the goal of the Trill project to get the Catalyst initiative back into the care home by offering a fully portable, plug-and-play music-making / communication unit that can be set up by a single caregiver with minimal training, yet allow group participation from afar. This involves the use of the Soundbeam, iPads, and a web connectivity platform in one mobile unit with integrated wireless Internet. Music-making sessions can be conducted on site, and/or virtually, and recorded, providing facilitators with records of their progress and families with invaluable souvenirs of their interactions. Trill can also double as a mobile video communication platform, keeping seniors in touch even during the most trying of times. In the music world, Trill is defined as a light, rapid succession or alternation of notes, often associated with songbirds. In a social context, Trill denotes light-hearted laughter, perhaps the best expression of Quality of Life.

**Open: A Collaborative Learning Platform for Older Adults with Cognitive Disabilities and HQP** *Fatoumata Bah, University of Ottawa*

Open Collaboration for Cognitive Accessibility is a social enterprise that employs persons with cognitive disabilities (CD) as Cognitive Accessibility Advisors to test and improve cognitive accessibility in everyday life. Advisors and HQP benefit from experiential learning by collaboratively testing and providing solutions for various clients. This presentation will highlight the benefits of the collaborative learning approach between HQP and older adults with CD.

**Semi-autonomous electrical stimulation therapy for diabetic skin wounds** *Reza Basiri, University of Toronto/Toronto Rehab Institute*

While Diabetic Foot Ulcer (DFU) affects 13% of the North American diabetic population, risks associated
with this condition increase among those 65 and older. DFU skin injuries may cause loss of mobility, independence and even higher mortality rates. My PhD research aims to enhance the practicality of electrical stimulation DFU therapy by reducing the workload and financial resources required to deliver the therapy to a larger number of patients. Electrical stimulation, the practice of applying electrical current to the wound to accelerate healing requires costly and complicated setup procedures that require frequent hospital visits and monitoring. I'm integrating deep learning DFU detection and classification networks such as EfficientNet with MyndTech, a Health Canada-approved electrical stimulation device in my research, to enable autonomous detection and diagnosis of the DFUs without frequent hospital and medical expert visits. I'm also conducting a DFU data collection to incorporate patients’ clinical notes and images to capture both visual and contextual diagnostic cues in my deep learning network. By using U-Net semantic segmentation and EfficientNet feature extraction backbone, I achieved a 0.65 mean average precision and 0.70 F1-score indicating reasonable recall performance in detecting DFUs in the test images. The U-Net+EfficientNet approach is being further developed by adding bounding-box regression to enhance the performance accuracy. The final result of this research falls in line with AGE-WELL WP1-2, and 5 workpackages that are attending to the needs of older adults, caregivers and utilizing technology for the prevention and reduction of disease and disability.

**Acceptability and usability of smart home technologies and wearables to support discharge planning from a rehabilitation hospital**

Andrew Chan, Geoff Gregson, Michel Lipsett, Adriana Ríos Rincón, Glenrose Rehabilitation Hospital Research

The Program to Accelerate Technologies for Homecare (PATH) project is a partnership between researchers across Canada and SmartOne Solutions to develop a common platform for implementing, testing and commercializing smart home and home health monitoring products. As one of the partner sites, we plan to install and test smart home technologies at the Glenrose Rehabilitation Hospital Independent Living Suite (ILS) to pilot user acceptability and usability of these technologies. Pilot testing will involve two phases of study. First, focus groups will be conducted with end users such as older adult, care partners and clinicians on the acceptability of smart home technologies, live home health monitoring of vital signs and physiologic data, and participation in longitudinal smart home research studies. The investigation will be based on the United Theory of Acceptance and Use of Technology (UTAUT) framework. Second, a combination of smart home technologies, including motion sensors, door contacts and smart light switches, and existing commercial home health monitoring devices, including heart, breathing and motion sensors, will be installed in the ILS at the Glenrose Hospital and connected to a central gateway to stream data to a central server creating the opportunity for analytics related to monitoring different scenarios. The Performance Assessment of Self-Care Skills will be used as a framework for activities to be monitored by these devices. The usability of these devices will be measured through direct methods with occupational therapists and patients using the ILS for discharge planning.

**Introducing new technology to monitor the health data of older adults with multi-morbidities related to dementia in Indigenous communities**

Meghan Chapados, University of Saskatchewan

Indigenous older adults living in rural communities require accessibility to and readiness for new technologies in order to support the monitoring of health data and health status, as well as dementia
education. If provided with health tools and education, Indigenous older adults living in rural communities have the opportunity to understand the ways nutrition, exercise, multiple morbidities and self-management of health issues relate to early onset dementia and their capacity to shape health outcomes. In partnership with Star Blanket Cree Nation and AGE-WELL, Morning Star Lodge is exploring how technology can be used to help manage and monitor multimorbidities that increase the risk of early onset dementia. The two-year project will consist of three technologies specific to the monitoring of blood glucose, blood pressure, and weight as well as the delivery of educational workshops concerning healthy lifestyles and wellness. The combination of the aforementioned technologies and educational workshops seeks to both monitor the health status of older adults living with multimorbidities linked to early onset dementia and promote healthy behaviours and lifestyles among older adults in Star Blanket Cree Nation.

Mainstream tablet apps for older adults: Testing usability and accessibility Yoobin Cho, University of Toronto

Objectives: Playing games and other activities on touchscreen devices is an increasingly popular pastime among older adults. Accessibility features, e.g., ability to change font size, volume, etc., are known to influence user experience but are not specific to older adults. The current study aimed to assess the usability and accessibility of mainstream apps to identify key features that impact older adults’ user experience. Methods: The App Testing Questionnaire (ATQ) was developed to measure older adults’ user experience using a Likert-type scale and post-play interview. Five mainstream apps were evaluated for accessibility using the AcTo Dementia framework, a tool for identifying accessible apps for individuals living with dementia. Seven older adults with no cognitive impairment played each game and completed the ATQ. ATQ scores and verbal feedback were compared with the AcTo scores to identify the most relevant accessibility features for healthy older adults. Results: Score comparisons between the ATQ and the AcTo showed that certain accessibility and usability app features are more important than others, for the user experience of older adults. The familiarity of the app’s content, the quality and depth of in-app instructions, and the customizability of app settings were the most relevant features. Conclusions: Analysis of ATQ scores and user feedback helped identify the accessibility features most relevant to healthy older adults. The qualitative data illuminate how certain app features can increase usability and accessibility for older adult users, enhancing their overall user experience. The results are important for future development of apps aimed at older adults.

Exploring factors associated with distress in community-dwelling older adults during the COVID-19 pandemic: A mixed methods study Nicholas Dietrich, McMaster University

Background: The COVID-19 pandemic and associated public health measures have negatively impacted the physical and mental health of older populations. Research has shown that some older adults are able to manage distress better than others. Understanding factors most associated with distress could help inform strategies to keep older adults healthy during and after the pandemic. Objectives: To identify factors most associated with high distress in community-dwelling older adults (aged 65+) during the pandemic and to explore lived experiences before and during the pandemic to understand how daily activities were managed. Methods: A sequential explanatory mixed methods design was undertaken where: 1) a survey that included the Impact of Event Scale-Revised (IES-R), a measure of subjective
distress, alongside other standardized measures was administered to 272 older Canadians by telephone or email. 2) From survey respondents, four individuals were purposively sampled by IES-R scores to undergo telephone interviews that explored their daily activities before and during the pandemic. **Results:** Linear regression showed that loneliness, low resilience, anxiety, and no cancer diagnosis significantly predicted distress; \( R^2=.28, F(4,260)=26.701, p<.001 \). Themes suggested participants were ‘surviving’ not thriving during the pandemic. Access to technology was raised in context of maintaining social connections; however, those reporting higher levels of distress did not have access to the internet. **Conclusion:** This study highlighted that resilience, alongside other factors, influenced the distress of older adults during the pandemic. Future interdisciplinary research will focus on ways to address the needs of those most at-risk.

**Exploring movement confidence among people with dementia and mild cognitive impairment during a motion-based technology intervention** Erica Dove, University of Toronto

**Background:** Movement confidence comprises “a person’s feeling of adequacy in a movement situation.” ‘Movement confident’ people are more likely to partake in and enjoy physical activities. However, the concept and measurement of movement confidence has not been explored among people with dementia and Mild Cognitive Impairment (MCI), who can benefit from participating in activities involving physical movement. **Methods:** Participants with dementia and MCI (n=66; mean MoCA=12.68/30) took part in a 10-week Xbox Kinect bowling intervention. Video recordings were taken during week one and 10 of the intervention and coded using behavioural analysis software. Count and percentage data were examined, and the coding scheme was used to create a categorical measure of movement confidence. Count, percentage, and categorical data were analyzed descriptively and compared using related-samples Wilcoxon signed rank tests. **Result:** Among study completers, movement confidence was high at the start and did not significantly decline over time, suggesting maintenance of function. Several behaviours signifying movement confidence, such as hip shifting, knee bending, change in base of support, and willingness to move, were captured using the coding scheme and the categorical measure. The coding scheme, categorical measure, and implications will be further described. **Conclusion:** This study is the first to examine the complex construct of movement confidence among people with dementia and MCI. This study is also the first to create an observational measure of movement confidence which could be used by clinicians to quickly score the movement confidence of people with dementia and MCI in various movement situations.

**Stakeholder informed revision of the health app review tool** Julie Faieta, Laval University

**Introduction:** The Health App Review Tool was developed as a clinical decision aid designed to determine the match between an individual affected by dementia or a dementia caregiver, and mobile apps designed to support health, quality of life, or social participation. According to a Human Centered Design approach, the HART has gone recurrent stakeholder evaluation to ensure usability. Recently, a pilot study was implemented to gather stakeholder input on the current web-based version of the HART. The feedback was considered and interpreted into actionable revisions to the assessment in the pursuit of a usable design. **Objective:** The revisions informed by this pilot data are outlined and explained in order to provide a current description of the updated HART. **Methods:** One of the primary barriers impacting HART usability was an error occurring when participants attempted to activate dynamic aspects of the web-based
assessment. Therefore, a new method of enabling pop-up text, HTML `<span class="mytooltip" title="[Explanation]">[Response Option]</span>` was identified through Lime Survey Consulting, and then implemented into applicable HART items. Furthermore, additional graphics were incorporated into the survey to identify dynamic components (HTML `&lt;#9432;&gt;`). Finally, the answer-option lists for two HART items were reduced drastically to reduce the burden associated with completing these items. **Conclusion:** The HART continues to develop in an iterative manner, guided by both the expertise of research professionals and the perceptions and preferences of stakeholders. Additional investigation is needed to assess the psychometric soundness and validity of the revised version of the HART.

**Usability of a smart technology-based adherence product in older adults** Sadaf Faisal, University of Waterloo

An older adult’s ability to autonomously manage their medications is an important indicator of whether they can live independently. Declining ability to manage medications has the potential to increase medication errors, and adversely affect health outcomes and quality of life. There has been an increase in development of innovative technologies designed to improve medication management capacity and adherence in the past two decades. However, the integration of these products by older adults (OAs) is not well investigated. A mixed methods study was conducted with OAs to examine the integration of a prototype smart multidose blister package (SMBP). Data was collected using in-home observations, photo-elicitation, semi-structured interviews, field notes and system usability scale (SUS). The interview guide was based on three frameworks: Technology Acceptance Model, Theory of Planned Behaviour and Capability, Opportunity, Motivation and Behaviour Model. Interview transcripts were analyzed using the Qualitative Analysis Guide of Leuven framework. Themes and sub-themes were mapped back to the frameworks. Ten OAs with a mean age of 76 years, 80% of which were females used the SMBP for eight weeks, OAs were dispensed an average of 11.1 medications. The interview analysis identified three themes: (1) factors influencing medication intake behaviour, (2) facilitators, and (3) barriers to the product use. The average SUS score was 75.5. The SMBP was found to be usable and acceptable by OAs. Ease of use, access to technology, product features, and cost can impact the integration of smart technology-based adherence products into daily medication taking routines among OAs.

**Virtual Gym: Serious game platform to personalize physical activity** Victor Fernandez, University of Alberta

Virtual Gym is an exercise platform for health practitioners to provide game-like exercises for older adults, individualized configurations to match the user’s capabilities. Provide an intuitive platform for health practitioners, and the editing capability supports their expertise in guiding older adults in a personalized exercise session. In addition, older adults are code signers of the gameplay catalogue, prioritizing the importance of personalized activities. The game catalogue includes six personalizable gameplays: (1) Bubbles, (2) Balloons, (3) Archery, (4) Climbing, (5) Flying Rings, and (6) Slice Saber. Each one of them with an individualized challenge level of: Coordination, Rhythm, Resistance and Concentration. These sequences aim to introduce users into virtual environments within a comfortable approach to the game mechanics. The innovating language embedded in Virtual Gym’s prescription includes selecting individual
preferences of virtual environments. Thus, providing a unique experience to each user. The model-driven environments' construction allows the platform to capture the user's preferences and adjust personal preferences. The platform is compatible with all-in-one devices for easy deployments (as the Oculus Quest I and II). Virtual Gym applied the Virtual Reality paradigm to make it easy for users to embody an avatar and do activities intuitively. In addition, we adopted the policy to co-create the gameplay with older adults to capture their preferences and evolve the platform to aid older adults in their physical activity routines and provide an enjoyable experience. Thus, even in Covid-19 difficult times, our users are participating with Virtual Gym. Virtual Gym aims to provide physical and cognitive exercise within an enjoyable experience for the users.

Determinants of behavioral intentions to use an automated pain behaviour monitoring system for long-term care: A mixed-methods pre-implementation study

Natasha Gallant, University of Regina

Background: To guide the forthcoming implementation and final development of an automated pain behaviour monitoring system, this study was aimed at identifying determinants that could be leveraged to maximize the likelihood of its successful implementation in long-term care (LTC). Methods: LTC nurses (N = 164) completed a set of self-report questionnaires measuring intentions to use the system as well as individual factors and perceptions hypothesized to influence these behavioural intentions. Stakeholders (N = 68) associated with two LTC facilities in Saskatchewan participated in individual interviews to provide perspectives on barriers and facilitators to implementing the system. Results: LTC nurses who more strongly endorsed that the system would be useful and easy-to-use had greater intentions to adopt it. Beliefs about the usefulness and ease-of-use of the system were further influenced by individual factors (e.g., insecurity about technology in general) and perceptions (e.g., appropriateness of the system for LTC facility). Stakeholders identified several barriers to be addressed (e.g., questions about system accuracy, expectations from staff regarding system alerts) and facilitators to be leveraged (e.g., timely pain assessments, reduction in workload) when implementing the system. Discussion: Findings from this study will provide guidance for the development of a pre-implementation intervention to increase the likelihood that the automated pain behaviour monitoring system is successfully implemented in LTC facilities. Drawing from the specific example of the automated pain behaviour monitoring system, a series of broader recommendations for implementing patient-oriented technologies for older adult care within Canadian settings will also be provided.

Public health policy on technology for self-management of chronic disability by older adults

Amélie Gauthier-beaupré, University of Ottawa

Increased life expectancy means that more Canadians are aging with chronic disease and associated disability. In response, self-management of chronic disease has been widely encouraged as a way to manage symptoms, treatments and deal with lifestyle changes. When coupled with technologies, self-management of chronic diseases allows older adults to be active players of their communities and of their care. In fact, Information and Communication Technology (ICT) can be particularly helpful for older adults to overcome functional barriers and help them with instrumental activities of daily living. However, ICT solutions are not being well integrated into policy frameworks for disease self-management. My current research is a first step into understanding the evolution of self-management policy over time and to
collaboratively develop solutions to ensure that technologies are better integrated into these policies. The project takes a mixed methods approach with this first phase being archival research on self-management policies in Ontario. Government of Ontario self-management policy documents have been published in limited number since 2005. They place emphasis on disease-specific approaches and multi-level engagement to ensure successful self-management. The potential for technology to facilitate chronic disease self-management is mentioned only occasionally. These findings suggest that policy may be changing at a rate that is much slower than the one of technological innovations for self-management. Future work in this area need to reflect the changing context in which older adults are living and ensure that policies focus significantly more on the roles of ICTs in self-management.

The influence of cognitive ability on older adults’ ability to take over driving control from an automated vehicle
Shabnam Haghzare, University of Toronto/Toronto Rehab Institute

Automated vehicles (AVs) hold potential promise in sustaining the safe mobility of older adults whose driving is compromised due to cognitive impairments. However, current AVs have an operational limit and when this limit is reached, the driver is expected to promptly take over driving control. The timely performance of takeover task draws upon cognitive resources that can be compromised in people with dementia (PwD) and people with Mild Cognitive Impairments (PwMCI). Therefore, this study investigates the abilities of PwD and PwMCI to perform an AV driving takeover task. 20 participants per three groups of PwD, PwMCI, and older adult controls will be recruited. Currently, the data collection for the controls and recruitment for the PwD and PwMCI are on-going. The present results are based on seven control participants who have completed the study to date. Participants completed a battery of sensory and cognitive tests and performed takeover tasks in response to an audio-visual alert in a simulated AV using a high-fidelity driving simulator. Each participant performed takeovers in eight driving conditions varying in lighting level (day/night), road structure (straight/curved), and speed limit (60/120 km/h). To characterize participants’ takeover abilities, their response time was measured as the time interval between the audio-visual alert and uptakes in speed (longitudinal takeover time), and changes in steering wheel angle (lateral takeover time). A correlation analysis was conducted between each of takeover time measures and cognitive and visual tests. MoCA scores showed a significant, negative correlation with lateral takeover time.

Association between falls, head impacts and mortality among older adults in long-term care
Mackenzie Heidel, Simon Fraser University

Falls in older adults predict mortality, independent of documented injuries from falls (Nurmi, 2004). However, it is unclear whether falls contribute to death, or serve as a marker of frailty. Head impact is a key marker of fall severity, with potentially unrecognized consequences. We analyzed data from a 10-year cohort study of video-captured falls in two Vancouver-area long-term care (LTC) homes, to test the hypothesis that mortality associates with fall rate, sex, and head impact in falls. Participants consisted of 415 people (54% women; average age 87 yrs (SD=8)) who experienced at least one fall recorded on video and passed away between 01/01/2011-01/03/2020. Survival analysis was conducted using Wilcoxon tests, univariate log-rank and multivariate Cox Proportional Hazards models. Compared to participants with 5 falls/year (n=200), those with <5 falls/year (n=215) survived 83% longer (849 versus 1557 days;
p<0.0001). Life expectancy decreased 4.5% per annual fall. Head impact rate was not associated with survival (p=0.0841). Women lived an average of 402 days longer than men, independent of fall rate (p<0.0001). Our results show that, while an increase of one fall/year decreased survival by only 4.5%, the mean difference in fall rate between higher and lower frequency fallers in LTC was 12 falls/year, which reduced life expectancy by half. Head impact did not associate with life expectancy but may influence quality of life. While further research is required to establish causality, our results reinforce the need for improved falls management in LTC.

Technology acceptance in theories of aging and technology Marjan Hosseini, University of Ottawa

The increasing number of aged people and the need for care as well as the costs of caring for them make it necessary to focus on aging technologies as a way of reinforcing independence and preventing or reducing disabilities; therefore, acceptance of technology by older adults is a critical topic to study. It is only recently that theorists have attempted to locate factors associated with the design of technologies and user acceptance within a broader understanding of the aging process and the lifeworlds of older adults. Although technology acceptance has been studied by different disciplines such as sociology and computer sciences, far fewer studies have been done on technology acceptance by older adults. This gap is reflected in a lack of bridging between technology acceptance models and theories of aging. The reigning approach to technology and aging embodies an interventionist logic that posits new technologies as interventions or solutions to the “problems” of aging. This logic reinforces a division between aging scholars and technology scholars and retarded the development of theories of aging and technology. In many technology projects, older adults are considered as being not interested in and familiar with the technology. This assumption stems from aging scholars’ failure to provide a description of aging with technology and frames acceptability problems as results of older people’s technology-skepticism. Advancing a role for technology in enhancing the health and wellness of elderly requires a research approach that locates technology acceptance within a conceptual foundation that spans theories of aging and technology.

Relationships between cognitive status and loneliness during COVID-19 You Zhi Hu & Annie Truuvert, University of Toronto

Background: Loneliness is closely associated with neurodegeneration in the elderly. Increased loneliness is associated with deficits in executive control functions such as response inhibition, cognitive flexibility, and attention control. Even in younger people, reductions in white matter integrity in executive control networks are associated with increased loneliness. Lockdowns due to the COVID-19 pandemic have only increased problems of social isolation, leading to a general increase in loneliness and mental health problems. Objective & Hypothesis: We carried out a study during the COVID-19 pandemic while people were socially distancing and facing less social interaction. We have developed a set of serious games which aim to measure cognitive decline in elderly. We assessed the negative relationship between well-established measurements of loneliness and response inhibition during gameplay. We also examined changes in game performance and loneliness over time. Method: Fourteen participants completed the serious games in 6 sessions. They completed the De Jong Gierveld Loneliness Scale and the World Health
Organization’s Disability Assessment Schedule (WHODAS) wellness questionnaire in the first, third and sixth sessions. Game performance was measured in response types (correct hit & false alarm) and response time. **Conclusion:** A negative correlation existed between loneliness, wellness score, and the game measuring response inhibition. Participants experienced slightly less loneliness and showed improved performance as the study progressed. We plan to extend the results to older adults from North York General Hospital to assess the impact of an exergaming intervention on loneliness and cognitive status in a long-term care setting.

**Co-creating a collective vision for mental wellness with urban Indigenous communities**  
Viviane Josewski, University of British Columbia

Mental wellness is a top priority for urban Indigenous communities, families and individuals living with diabetes and/or obesity. Programs that support and strengthen the mental wellness of Indigenous peoples are essential for improving obesity and diabetes-related outcomes for urban Indigenous populations. However, among urban Indigenous communities, access to culturally safe mental wellness programs remains limited. The current study aims to address this gap by partnering with three Friendship Centers (one urban and 2 rural) to co-develop a collective vision for mental wellness based in the lived experience and perspectives of urban/rural Indigenous communities, families and individuals living with diabetes and/or obesity. The study will be carried out in collaboration with two larger community-based obesity/diabetes projects with five urban Indigenous Friendship/Métis Centres. Each Centre has its own local Community Research Liaison (CRL) and Community Advisory Committee (CAT) made up of Elders, Knowledge Keepers, Traditional Healers, local providers, staff and community members. Through these community research partnerships, we have supported Indigenous-led, culturally safe and wholistic diabetes/obesity programs and telehealth clinics. Guided by Two-Eyed Seeing principles and Indigenous Methodologies, the new study will work with CRLs and CATs to identify local mental wellness needs, service gaps and priorities using information gathered through environmental scans and Elder-facilitated Talking Circles. Excepted outcomes include a locally-informed community vision and recommendations for culturally safe mental wellness programming inclusive of Traditional and Western healing approaches. Collective decision-making will inform when, how and with whom to share community learnings.

**Employment barriers and facilitators for older workers and older job seekers: A scoping review**  
Jonathan Lai, University of Alberta

Access to employment for individuals in later-life is important not only for financial reasons, but also for reasons related to social inclusion and civic participation. Governments around the world have identified the continued labour force participation of older adults as a sustainability measure to help support welfare states and social programs. As older workers, those aged 50 and older, will continue to comprise an increasing proportion of the labour force into the future, there is a growing need to understand the contemporary issues associated with later-life employability. This scoping review addressed two research questions. What are the employment barriers and enablers that older workers and older job seekers experience? And, what are the predictors and influencing factors that contribute to the early or involuntary labour force exit of older workers? A total of 185 peer-reviewed articles and 56 grey literature reports were included for data extraction. Findings were organized into relevant ‘environments’ based on human ecology theory: characteristics about the individual worker, their family context, their workplace context,
and broader community, industry, government policy, and societal contexts. Findings indicate that older workers prefer to experience a gradual detachment from paid work responsibilities, but that many need to continue working full-time out of financial necessity. Individual health status, level of education, and mid-life employment history are strong indicators of older adult employability. Women tend to experience more work-life imbalance and employment disruptions than men. Implications for supporting the labour force contributions of older workers will be discussed.

Mobilité, Sécurité routière et Vieillissement: peuvent-ils faire bonne route ensemble ? Martin Lavallière, Université du Québec à Chicoutimi

Entre le droit à la mobilité et le privilège d'accès à la conduite, la conduite d'un véhicule de promenade représente un symbole fort d'autonomie et de vieillissement réussi pour plusieurs personnes âgées. Cette présentation portera sur les nombreux défis et opportunités auxquels font face les chercheurs et les intervenants œuvrant auprès des personnes vieillissantes qui se questionnent quant à leur mobilité sous toutes ses formes et plus particulièrement, face à leurs capacités à conduire sécuritairement.

Return home interviews for missing older adults living with dementia: A scoping review Elyse Letts, University of Waterloo

Introduction: When missing persons with dementia are found and returned home, an interview can be conducted to find ways to support and prevent repeat incidents. However, the use of such return home interviews is not well understood for this population. Objectives: This review aimed to understand return home interviews with all populations including persons with dementia. Methods: We searched 20 databases for scholarly and grey literature pertaining to return home interviews regardless of publication year, study design, and target population. Results: We included 11 articles in scholarly, and 94 grey literature sources. Most (78% of sources that reported) were from the United Kingdom, were related to missing children (academic 55%, grey 61%), and none focused on persons living with dementia. The main purpose of the interviews was to confirm the missing person’s safety and understand the causes of the missing incident, identify support needs, and to provide the person with support to reduce repeat missing incidents. Interviews were typically conducted by police or charitable organizations within 72 hours after a missing person’s return. Conclusion: Despite the potential for return home interviews to safeguard persons with dementia from repeat missing incidents, there is a gap in the literature that examines this potential. This review informs research and provides insights from work with younger populations that can be tried by community organizations and police services interested in adopting this practice with persons living with dementia. Future evaluations of return home interviews should confirm whether these interviews can reduce repeat incidents.

Development of an interactive version of the Canadian Guideline for Safe Wandering Esther Leung, University of Waterloo

Introduction: The prevalence of missing persons living with dementia is increasing. Few resources exist to provide proactive strategies that mitigate the risks associated with wandering and getting lost. Existing resources are difficult to find, portray wandering negatively, and tend to limit the autonomy and independence of persons with dementia. Objectives: (1) To develop an interactive online, web-based version of the Canadian Guideline for Safe Wandering for use by persons with dementia and their care...
partners; and (2) to assess the validity and usability of the guideline which provides proactive strategies based on risk levels. **Method/Approach:** A participatory design involving virtual focus groups with older adults, including persons living with dementia informed content and accessibility. Professionals and trainees with backgrounds in occupational therapy, recreation therapy, design and user experience, and computer engineering collaboratively developed the website. **Results:** Virtual focus groups revealed participants’ preferences and suggested areas for improvement. Positive feedback included the dementia-friendly illustrations and the overall simplicity of the web interface. Areas for improvement included utilizing intuitive navigation, plain language, and selecting images that best convey key points. **Conclusion:** To promote safe wandering and autonomy, this website provides specific, actionable strategies for persons who have dementia, based on their risk level of getting lost. After determining the guideline’s validity, revisions will be made for the uptake among persons living with dementia, care partners, health professionals, and community organizations. Findings will inform the creation of future websites for these user groups, especially those who live with dementia.

Too many caring demands?: Educational and employment consequences can lead to precarious financial situations and poor financial well-being for young carers

Jamie MacDonald, University of Alberta

Canadian young carers are a marginalized and unrecognized group who experience a wide range of consequences as a result of their caregiving responsibilities. These consequences span many areas of young carers’ lives from their education to their social connections, relationships, and financial wellbeing. Many young carers in Canada experience deficits or gaps in their education which can have long-lasting consequences for their employment prospects and their future financial situation. Additionally, because of their caring demands, many young carers are unable to work in either full-time or part-time paid jobs, which impacts their employability, the types of education they have access to, and their future earning potential. Young carers’ caring responsibilities have implications for policy. It is imperative that more financial, educational, employment, and caring supports are available to young carers. The financial supports need to come from governments while educational supports need to come from practitioners such as school boards, schools, principals, and teachers. Employment supports need to be provided from schools and from community organizations equipped to handle the specific needs and situations of young carers. Caring supports can come from governments at various levels. By informing audiences about the issues facing young carers, especially in the domains of education and employment, I aim to foster collaboration among policymakers and practitioners to ensure the highest quality of life for young carers and to ensure their safety and quality of life in all respects, including financial, in the future.

Evaluation of a person-centred care assessment tool for older adults with complex needs in a long-term care setting

Carlee MacNeill, Dalhousie University

**Background:** The increasingly aging Canadian population is associated with growing numbers of Canadians aging with or aging into disabilities, which in turn impacts long-term care (LTC) settings and resources. The World Health Organization’s goal of the decade is to optimize all older people’s potential for healthy aging (HA), including those who experience disease or disability. There is no consensus on how to measure HA and most HA research has focused on older adults in community settings. The importance of supporting HA of older adults living with disability in LTC has been recognized and represents a growing
area of research. **Objective:** This project aims to evaluate how the Age Care Technologies (ACT) Assessment characterizes older adults with complex care issues in LTC and investigates the role of the ACT Assessment for measuring HA. **Methods:** We will conduct semi-structured interviews featuring the ACT Assessment and other quantitative questionnaires with residents (N = 50) in an LTC institution in Halifax, Nova Scotia. The ACT Assessment is a standardized holistic personal assessment that provides an overview of an older adult's functioning, environment, and resources. This tool will provide insight for the personalization of care plans for each resident. This data will be crucial for gaining a comprehensive understanding of individual and organizational needs that can be addressed through policy and intervention to promote HA. **Implications:** This research will help promote a rights-based approach to population aging and enable older adults to have a central role in decision-making about their own lives.

**Engaging Indigenous older adults with technology use to respond to health and wellbeing concerns and needs**  
*Cari Mcilduff, University of Saskatchewan*

Many Indigenous older adults have expressed the desire to learn more about technology and recognize the value of technology in supporting healthy aging; however, as Morning Star Lodge has previously found, accessibility and readiness were key factors in the use of this technology (Starblanket et al., 2019a). Utilizing the guiding principles of the Model of Engaging Communities Collaboratively (MECC, McIlduff et al., 2020) and the Ethical Engagement Training Module (Bourassa, 2020), Morning Star Lodge partnered with Star Blanket Cree Nation to support five Indigenous older adults to support a healthy lifestyle by increasing their access to and engagement with culturally safe technology solutions individual to their specific health and lifestyle needs. These co-researchers are provided with tablets and MiFis (mobile internet access) and learning workshops. Currently all co-researchers have gone through their first interview and several workshops from which, observationally, their confidence has grown using the technology to access health information. We will discuss findings to date and the significant barriers the co-researchers and the research in general has faced due to COVID-19 restrictions. Particularly given the need during the COVID-19 pandemic to continue to stay semi-isolated at this time due to Indigenous older adults being a very high-risk population; the information gained through this work will support Indigenous communities in Canada and globally in using technology to respond to Indigenous older adults' health and wellbeing. There is also significant need for pandemic preparedness work to be done with Indigenous communities and this work could inform.

**What is the role of police after a missing person living with dementia is found and returned home?**  
**Perspectives of police services in Canada and Scotland**  
*Lauren McLennan, University of Waterloo*

**Introduction:** When persons living with dementia go missing, police are typically responsible for locating and returning these individuals to their places of residence. In some countries, interviews may be conducted with returned missing persons to help prevent a recurrence. **Objectives:** The purpose of this preliminary study was to understand police protocol after missing older adults are found and returned home. Four police officers from Scotland (n=1), Alberta (n=1), and Ontario (n=2) were interviewed online. Data collection and analysis were concurrent and iterative; conventional content analysis guided the process. **Results:** In Scotland, “return discussions” are conducted with returned missing persons within 72 hours of their return. These discussions are conducted by service providers to understand circumstances around the missing incident to prevent a recurrence. Information is used to connect the returned person to...
community supports. Canadian participants stated there are no structured protocols for interviewing returned missing persons living with dementia. Some police services may follow up by doing checks on older adults at the request of police, health services or community members but, generally, Canadian police services focus on finding missing persons. **Conclusion:** There does not appear to be a protocol for interviewing returned missing vulnerable older adults in Canada, unlike Scotland. We plan further interviews with other types of first responders (e.g., search and rescue personnel) and service providers (e.g., social workers) to confirm this preliminary finding and to identify recommendations for practice.

**Using cognitive executive function training and virtual reality simulations to reduce falls risk in older adults with hearing loss** Niroshica Mohanathas, Toronto Rehab Institute/University of Toronto

The most prevalent chronic health condition in older adults is age related hearing loss (ARHL). ARHL has many consequences, including a 3x greater risk of falls and has been identified as the top potentially modifiable midlife risk factor for dementia. One hypothesis is that ARHL causes increased “cognitive load” because listening effort is increased, thereby taking important cognitive resources away from behaviours supporting safe mobility (e.g., when having to listen and balance/walk simultaneously). Virtual reality (VR) simulators provide valuable tools for examining complex sensory-motor behaviours during realistic everyday challenges (e.g., listening to a conversation while crossing a busy city intersection). However, little is known about whether cognitive (executive function (EF)) training can improve mobility-related task performance (particularly during complex conditions). Therefore, the current study will explore the effects of cognitive EF training on listening-while-walking task performance in 40 older adults (65-80 years of age) with normal hearing, 40 older adult hearing aid users, and 40 middle-aged adults (45-65 years of age) using VR simulations. I hypothesize that participants who undergo cognitive EF training will show improved walking and listening task performance, with the greatest EF training-related gains in the ARHL group. Training cognition can support brain health to offset the negative effects of sensory loss on the brain. If successful, this could provide novel recommendations to emphasize cognitive training strategies in clinical practices for individuals with hearing loss; to promote cognitive health and mobility related safety.

**Robo ludens: Designing games for social robots to foster older adult's wellbeing** John Munoz, University of Waterloo

Using games as medium to explore how humans interact with social robots has been proposed as a suitable and engaging solution to create playful scenarios to promote cognitive health and wellbeing among older adults. Nevertheless, the creation of games and playful activities involving older adults and social robots carries multiple challenges, covering both technological and human-robot interaction (HRI) aspects. This presentation will present a recently published game design taxonomy that covers the fundamental aspects of creating games when involving social robots in HRI scenarios. The homo ludens taxonomy is divided into two main aspects: the robot (role, appearance, motor abilities) and the game (mechanics, application, sensing capabilities, and feedback modalities), and it permits a comprehensive view of the fundamental elements that should be considered when designing games with robots for multiple purposes. The presentation will also show two concrete examples of games created to foster older adult's wellbeing via socially interactive activities with robots; the design process, research goals, and overall implementation will be discussed in light of the elements previously described in the taxonomy.
Finally, the presentation will also reveal important lessons learned and custom-made tools created to facilitate the game design process using social robots targeting older adults.

Supporting autonomy, independence, and safety through locator devices for persons living with dementia

Noelannah Neubauer and Serrina Philip, University of Waterloo

The global prevalence of dementia continues to grow and is a significant public health concern. Wandering that results in a missing incident, or critical wandering, is a concern for health practitioners and care partners. Sixty percent of persons living with dementia will become lost at least once. One strategy to reduce the risk of critical wandering is the use of locator devices such as Global Position Systems (GPS). These devices can promote safe wandering while allowing a level of independence, autonomy, and safety. Although locator devices show promise, adoption and acceptance rates remain low. We used a qualitative approach to identify the essential features to be included in a locator device usability scale for persons living with dementia. We conducted five focus groups with individuals who have dementia, care partners, service providers, and technology developers, on necessary factors for locator devices. Data analysis used conventional content analysis. Verification and trustworthiness strategies were used to increase rigor. The participants identified 10 essential features for a usability scale: personalization, aesthetic appeal, straightforwardness, interconnectivity, geographic connection, privacy, affordability, two-way communication, socially acceptable, and features such as “help button”. These items will be used to develop the usability scale. A rating scale for users to rate essential features could help users choose devices that they are likely to accept and adopt, thereby enhancing the safety of persons living with dementia and their ability to live independently.

Mindful garden digital intervention in the management of hyperactive delirium

Michelle Nicholas, Simon Fraser University

Delirium is a fluctuating state of confusion and agitation that affects up to 80% of critical care patients. Delirium is linked to increased risk of death and worsened clinical outcomes. Patients with hyper-active delirium have associated psycho-motor agitation and can become aggressive posing a risk of physical harm to themselves and healthcare staff. While delirium can happen at any age, those with an age >65 or pre-existing brain health conditions like Alzheimer’s or dementia are most at risk. Current management relies heavily on the use of medications, that have potential toxicities and physical restraints, which are associated with negative outcomes. We are currently conducting a single centre RCT aimed to test the use of a novel digital therapeutic intervention, Mindful Garden (MG). MG is a behaviour modification platform built on video game technology that uses a screen-based delivery system to target anxiety and agitation related to delirium. MG generates layered dynamic nature imagery, a “virtual garden,” in direct response to patient movement and vocalization, the surrogate markers of agitation. Delirious patients (n=70), exhibiting hyper-active behaviours will be enrolled with the intervention arm receiving 4 hours of exposure to MG in conjunction with standard care vs standard care alone. The primary outcome is incidence of unscheduled medication use for the management of delirium associated agitation. Secondary outcomes include physical restraint use, agitation, and delirium scores. This trial provides the basis for a series of non-randomized iterative trials, allowing for ongoing product development and refinement of the Mindful Garden intervention.
**MOvIT+: Pre-validation of monitoring the usage of powered wheelchairs with the MOvIT+ platform**

Adrien Pajon, Center for Interdisciplinary Research in Rehabilitation and Social Integration (CIRRIS)

**Background:** Dynamic tilting of powered wheelchairs (PWCs) can manage risks related to pressure sores, pain or other seating challenges in older adults. However, few users follow the tilt frequency and angle recommended for positive therapeutic effects. The MOvIT+ platform ([www.movitplus.com](http://www.movitplus.com)) uses low-cost sensors (a pressure mat, two inertial measurement units (IMU), a floor-facing camera), an embedded computer and a web interface to measure such activities. The goal is to better monitor the real use of PWCs in relation to clinical recommendations. A prototype has been developed but has not been validated yet.

**Objective:** Validate the prototype’s precision and robustness.

**Method:** Seating presence was tested with 0.5kg weight increments placed on the pressure mat. Tilt angle was evaluated with a test bench made of an electronic protractor. Motion detection using the camera was tested by driving the PWC.

**Results:** Seating presence was detected for weights higher than 2kg. Tilt angle had offsets (up to 10deg) and high noise (±5deg > ±1deg from requirements) both due to inefficient calibration and filtering. Motion detection suffered from unintentional disconnection and missing measurement. **Perspectives:** To improve tilt angle precision, we will enhance its computing algorithm. Camera data for motion detection will be replaced with IMUs, which could detect vibrations with higher robustness. Precision and robustness of new measurements will be validated in laboratory and living environment of PWC users. Finally, for the next MOvIT+ development, we aim at upgrading the platform with additional sensors to monitor: incontinence, sliding and shear forces.

---

**Can intelligent powered wheelchairs be controlled by low-cost brain-computer interfaces?** Adina Panchea, Université de Sherbrooke

The loss of tactile sensitivity due to aging or to the decrease of motor control can impact the usability of tactile interfaces. However, this is a frequent interaction modality for controlling an Intelligent Powered Wheelchair (IPW). Brain-Computer Interfaces (BCIs) present an alternative for interactions with some assistive technologies, and more precisely IPWs. Our research team intends to complement the development of an IPW by extending existing control modality, i.e. tactile, with BCIs. We will present the first tests we were able to perform with an Ultracortex "Mark IV" EEG (or OpenBCI) Headset in order to evaluate if the signals provided can be used to directly control the IPW. Our preliminary out-of-chair tests concluded that further study is needed to improve the BCI interaction mode in order to use these interfaces in the navigation module. Indeed, it is difficult to extract a sufficiently specific signal from this type of headset, which must be calibrated for each user, to control the IPW with precision and accuracy. These results led us to adopt a new strategy in the development of the IPW, which is based on learning methods. First, we will use machine learning techniques to build a model with the goal of extracting sufficiently specific signals for navigation control (i.e. forward/backward, start/stop, left/right). Then, these commands will allow to navigate a space mapped in advance by the IPW while taking into account the social events present in the environment. Finally, tests will be performed with non-users and wheelchair users.
The future of aging: Using low-cost wearables to monitor mobility in seniors

Denesh Peramakumar, McMaster University

Mobility is defined as the ability to move freely, easily, and through one’s permitted range of motion, with control. Current clinical and epidemiological evidence suggests that the health of aging adults can be well monitored by assessing physical function, such as through mobility. For example, slower walking speeds and longer times to rise from a chair and sit down are consistently associated with lower well-being and quality of life in senior adults beyond their 50s. Emerging research suggests deviations in broader mobility patterns, such as in pathfinding, can be an early indicator of neurological conditions like Alzheimer's. In spite of the clear value of mobility-based measurements, there is a lack of objective, easy-to-use, and affordable mobility assessment tools that record and analyze data to provide patients with readily interpretable and actionable results. In order to address this unmet need, we propose a low-cost wearable device that contains several sensors including an accelerometer, a heart rate sensor, a skin conductance sensor, a GPS, and a pedometer. This device will be accompanied by software that is able to analyze the data points retrieved from the sensors and provide the user and their caregivers with relevant health information. Ultimately, we hope this device will enable seniors to be more informed about their personal health and provide early detection of adverse health outcomes (e.g. chronic conditions) so that preventative measures can be taken.

The risk of going missing in persons living with dementia: A scoping review

Hector Perez, University of Waterloo

Worldwide the number of people living with dementia is projected to reach 82 million in 2030. Although the proportion of individuals with dementia who go missing is increasing, little is known about the associated risk factors. Critical wandering, which refers to wandering that results in a missing incident, can result in injury or death. The objective of this study was to identify the risk factors related to critical wandering. We conducted a scoping review and searched four academic databases: Medline, EMBASE, CINAHL, and Scopus. We included studies that referred to critical wandering in persons living with dementia or other cognitive impairments, and included papers published from 1980 onwards. We identified 3,376 publications, 78 of which met inclusion criteria for extraction. We followed a structured methodological framework for conducting this scoping review to process, synthesize, and categorize the results. We identified four types of risk factors associated with going missing and getting lost among persons living with dementia: (1) Personal characteristics, (2) physical environment and geographical location, (3) cultural environment and (4) social environment and support resources. A clear understanding of risk factors will inform practices and policies that create safer communities for people living with dementia.

Indoor location data for tracking health-related human behaviour patterns: A scoping review

Leia Shum, Toronto Rehab Institute, University Health Network

Real-time location system (RTLS) technologies record the location of individuals and are valuable sources of spatiotemporal data that can be used to help understand patterns of human movement and behaviour. RTLS technologies cover a wide breadth of applications and it is necessary to consolidate the existing
knowledge and discover the extent of its scope. Existing reviews have been found that study user acceptance, feasibility, and implementation; however, few focus on approaches to the analysis of RTLS data for the purpose of describing human behaviours. A scoping review was performed to investigate what human behaviours could be described using indoor location data. Specifically, types of behaviour outcomes, types of RTLS data features, and types of tracking technologies were explored. Four major categories of applications were identified: health status monitoring, consumer behaviours, developmental behaviour, and workplace safety/efficiency. The most common outcomes in monitoring health status assessed cognitive health, and over half focused on monitoring health of older adults. A significant portion of studies did not pursue outcomes beyond using RTLS to recognize daily activities remotely and did not use clinical gold standards to validate or establish the meaningfulness of measures. The features of RTLS data could be categorized into 4 groups based on relation to space/time: dwell time, activity level, trajectory, and proximity. There are few studies in which RTLS is used to analyze interactions between more than one participant at once, despite large datasets. RTLS technologies provide a promising tool to collect ample data for derivation of behaviour patterns.

Detection of behavioural symptoms in dementia using personalized machine learning models and multimodal sensor data  
Sofija Spasojevic, University of Toronto

**Background:** People Living with Dementia often experience behavioural and psychological symptoms (BPSD), such as episodes of agitation and aggression that can put them at risk. There is great potential for the development of digital biomarkers of behavioural symptoms derived from sensor data. Inter-individual variability is an important barrier to the performance of these models. The aim of this work is to use wearable multimodal sensors to develop personalized machine learning models capable of detecting individual patterns of BPSD. **Methods:** Older adults with dementia and BPSD (n=17) wore a wristband from morning to night for a maximum of 8 weeks. The wristband device captured motion (accelerometer) and physiological indicators (blood volume pulse, electrodermal activity, and skin temperature). After processing and extracting features from the sensor data, personalized machine learning models were developed using 1-minute intervals to classify behavioural symptoms by type. **Results:** A total of 239 days of sensor data that contained behavioural events were included in the analysis. Behavioural events were relatively rare over the period of observation, representing 3.4% of the total data. Personalized models were able to classify behavioural symptoms with a median AUC of 0.87 (range 0.64-0.95) and to classify three behaviour types (median AUC 0.87; range 0.49-1). **Conclusion:** Behavioural symptoms in dementia are highly individualized, and the best approach to detect particular behaviour types is to develop personalized models. The patterns of sensor data associated with BPSD and future studies developing technology for the digital phenotyping of these behaviours would benefit from personalization.

Compensatory stepping responses during real-life falls in older adults  
Bianca Te, Simon Fraser University

Falls are a major cause of injury and death in older adults. Risk for falls depends on frequency of imbalance episodes, and ability to recover balance. Laboratory studies have shown that older adults are more likely than young adults to recover balance by stepping versus feet-in-place responses, and utilize multiple small steps versus a single larger step. We extended prior literature by characterizing the stepping responses of
older adults during real-life falls, captured on video in long-term care. While all of these events resulted in falls, we explored stepping as a reflection of the intactness of neuromuscular systems involved in detecting and responding to falls. We tested the hypothesis that initial fall direction associates with the prevalence, direction and size of steps. We included 1516 falls experienced by 515 residents (mean age 82.7 (SD=8.9); 59% women). Stepping responses occurred in 76% of falls. Among these responses, 81% of steps aligned with the initial fall direction, 80% involved multiple steps, and 64% of steps were small (less than one-half foot length). Step characteristics also associated with fall direction, resident age, held weight-bearing objects and successful reach-to-grasp responses. Our results suggest that older adults in LTC respond to falls with attempts to recover balance through compensatory stepping. Most falls were accompanied by steps that were aligned to the fall direction, but small in size, suggesting the need for interventions to target those components of strength and flexibility that may limit step size.

The CONNECTORS project: Facilitating social connectedness with seniors Carly Thrower, University of Toronto

Introduction: Declining social connectedness in seniors is a significant public health issue due to the negative impact on physical and mental wellbeing. Community day programs for seniors are an opportunity to facilitate social connectedness; however, due to the challenges exacerbated by COVID-19, there remains an unmet need for this type of programming. Aim: Using the Toronto Translational Research Framework, and in collaboration with Etobicoke Services for Seniors (ESS), this project aims to address the need for social connectedness by answering the following translational research questions: (1) What does social connectedness mean to seniors? (2) How do seniors experience social connectedness? and (3) How can this be translated into community programming? Method: Focus groups were used to gather seniors’ and staff insight into social connection. A thematic analysis was conducted and findings were used to develop design principles for community programming. These design principles, reviewed by participants in member-checking sessions, guided collaborative brainstorming sessions with ESS to develop impactful community programming. Results: Five categories of themes emerged: (1) Barriers to social connection, (2) Connecting remotely, (3) Motivations for connecting, (4) Diversity of social relationships and (5) Elements of activities which facilitate connection. Eight design principles for community programming that facilitates social connection were developed from these themes. Conclusion: Social connectedness is important for the health and wellbeing of seniors. The design principles described here may be incorporated by community organizations to improve upon or create new programs that facilitate social connectedness amongst seniors.

Comment fiabiliser l'architecture d'habitat intelligent actuellement proposée par le LIARA et généraliser son fonctionnement pour s'adapter aux technologies émergentes Florentin Thullier, Université du Québec à Chicoutimi

Aujourd'hui, une grande majorité des habitats intelligents présentés dans le cadre de recherches académiques, dont le LIARA fait partie, reposent sur des architectures monolithiques qui admettent des problématiques de fiabilité. De plus, celles-ci ont été conçues pour exploiter des technologies spécifiques tant sur le plan des capteurs qui les composent que sur les protocoles de communication permettant l'acquisition des données. Ainsi, cette présentation va traiter des solutions proposées pour pallier ces problématiques de fiabilité dans le cadre du LIARA, ainsi que des mécanismes qui nous ont permis de
Intelligent powered wheelchair for users and their caregivers: An overview  
Nathalie Todam Nguepnang, University of Montreal

Different prototypes of intelligent powered wheelchairs (IPW) are being developed for people who have difficulties using standard powered wheelchairs. The aim of our research was to map the existing IPWs proposed in the literature, until September 2020, in order (a) to better understand if they meet the needs of powered wheelchair users (PWus) and their caregivers, and (b) to better guide the ongoing development of IPWs by taking in account the PWus and their caregivers' needs. A total of 938 research papers were mapped and 75 are investigated. Results suggest that the different modalities proposed to control the IPW could meet some of the PWus' needs, such as mobility improvement, mobility independence and social participation for some PWus. However, we also found that there are certain factors which might affect the acceptance of IPWs. Moreover, one limitation of today's literature is the lack of experimental studies with the PWus that could help assess the efficiency of IPW. All these findings lead us to perform further studies in order to improve the functioning of the existing prototypes of IPW. Therefore, in addition to presenting the findings from the literature, this presentation will also focus on discussing our strategy to involve PWus and their caregivers' in the ongoing process of IPWs development. The intended strategy based on the user-centered design approach will bring together our multidisciplinary team, composed of rehabilitation and robotics researchers, and PWus and their caregivers through experimental trials in real environments.

Do computers know whether older adults are engaged while playing mobile games?  
Melika Torabgar & Adriana Rios Rincon, University of Alberta

Background and Objective: Engagement while playing mobile games can improve cognitive skills in older adults, especially those living with dementia. The level of engagement impacts the therapeutic effect of playing mobile games. Methods for measuring engagement during computer game-play include mainly self-report questionnaires, which are difficult to use by older adults with dementia. We aim to identify the existing technologies to recognize engagement while people play video games through a systematic literature review. Method: We searched on two databases (i.e., Scopus and Web of Science) for studies that reported on technologies to automatically recognize engagement while people played computer games. Two independent readers screened 753 abstracts, reviewed 53 full papers and included sixteen studies for data extraction. Results: The range of age of the participants in the included studies was between 8 and 55 years. Electroencephalography, heart rate, skin temperature, and facial expression recognition were broadly used for recognizing the participant's level of engagement. Classifiers such as Genetic algorithm, Deep Neural Network, and Support Vector Machine (SVM) were the most commonly used. SVM demonstrated the highest accuracy (of 97%) for engagement recognition. Conclusion: The literature shows that engagement has been recognized mainly by analyzing participants' bio-signals and facial expressions. No study included older adults for developing or testing methods to recognize engagement automatically. Older adults may demonstrate engagement through unique facial expressions or biosignals patterns; thus, developing autonomous systems to identify the engagement in older adults using older adults' data is needed.
Supporting scalable development of serious games brain tagger researcher platform: Supporting scalable development of serious games for cognitive assessment Bella (Yigong) Zhang, University of Toronto

In our past research, we have developed and validated serious games for cognitive assessment and have made them available for different groups of researchers to use. As more and more researchers requested using our games in their research studies, a capacity bottleneck for software development was reached. To create a long-term solution to this challenge, we plan to create the Braintagger Researcher Platform (BRP) so that researchers could customize games for their research studies without having to have coding skills. The development of online experimental platforms is still at an early stage in cognitive research but it is fast evolving. I employed a user-centred design process to develop an implementation-ready, high-fidelity prototype for the first version of the Researcher Platform. In this talk, I will present findings from the design process and share lessons learned in order to develop a scalable, digital health service delivery platform.