Core Research Program Awards 2020-2023 (by Challenge Area)

1. **Project Title:** Designing Innovative Social Robots through end-User ParTicipation (DISRUPT)
Project Lead(s): Julie Robillard, University of British Columbia; Jesse Hoey, University of Waterloo
Funding Amount: $550,000
Primary Challenge Area: Supportive Homes & Communities

Summary: Social robots are designed to help humans by interacting with them. These types of robots are promising in their potential to support the brain health of older adults, for example by reducing stress and providing reminders for important activities. Despite these benefits, few older adults use social robots, due to misunderstandings about what robots can and cannot do, difficulties in connecting with the robot, and concerns about ethical issues. The goal of the Designing Innovative Social Robots through end-User ParTicipation (DISRUPT) project is to test a new approach for the development of social robots that brings together experts in different areas in a co-creation process. In a first step, we will use surveys and interviews to gain a better understanding of the benefits and harms older adults experience when they interact with social robots. In a second step, we will host workshops with older adults, computer scientists, engineers, ethicists and health care providers to co-create robots. The DISRUPT project will also include different knowledge exchange activities, like tweet chats, webinars and policy development. Altogether, the DISRUPT project will play a key role in showcasing the benefits of engaging older adults in research, social robot co-creation and policy, and in advancing the field of social robotics.

2. **Project Title:** Development of smart homes for aging in place at Résidences Le 1615 & Le 1625
Project Lead(s): Sylvain Giroux and Mélanie Couture, Université de Sherbrooke; Nathalie Bier, Université de Montréal (CRIUGM)
Funding Amount: $400,000
Primary Challenge Area: Supportive Homes & Communities

Summary: Though the benefits of aging in place, it is still a challenge to develop assistive technologies that are affordable, sustainable, and scientifically proven to be effective, efficient and satisfactory for all. In this research-action project, a federated chain of technologies will be co-designed and implemented in two collective residences for seniors. All 65 tenants will have a water damage prevention system. Twelve will also benefit from customized ready-to-use monitoring and assistance scenarios. Once deployed, an Internet of Things infrastructure will collect data. Crunching these data, learning algorithms will feed independent but cooperating context-aware applications that will provide feedback to seniors, families, caregivers, and building managers, thus empowering elders and crafting care circles. Blockchains and smart contracts will enforce privacy and help users regain control over their data. This project will lead to 1) a guide for implementing smart environments in collective residences; 2) commercialized assistive technologies at the lowest costs and with demonstrated usability through a rigorous research process, involving partnership with seniors and their ecosystems; 3) studies measuring their impact on autonomy, quality of life and costs. In the long run, these technologies will be implemented at a larger scale in various collective housings using a cooperative business model.

3. **Project Title:** Evaluating and scaling up MoviT+ (MOVIT-UP)
Project Lead(s): Claudine Auger, Université de Montréal
Funding Amount: $100,000
Primary Challenge Area: Health Care & Health Service Delivery

Summary: Our proposal will scale up and evaluate MOvIT+ (Mobility Outcomes via Information Technology), a web-based service that is unique and novel in Canada. Technology: MOvIT+ brings together multiple digital technologies to enhance the follow-up of older adults and caregivers who use mobility assistive technologies (ATs): i) an Internet-based system for registration, telemonitoring and teletraining after prescription, ii) a sensor-based intelligent positioning system to monitor the actual usage of the mobility device and provide feedback based on clinical recommendations, iii) a website that regroups training resources for mobility AT users. The current proposal will be adding iv) a 3D mapping application of the user environment, v) a Cloud infrastructure to manage the anonymized sensor-based data generated by the fleet of instrumented devices. Services: MOvIT+ helps structure the follow-up services that are otherwise not available in the healthcare system. It offers training tools based on the monitoring results and alerts rehabilitation professionals only if remote counselling of the user/caregiver is needed. Policy & Practices: A large-scale implementation protocol will be co-developed with participating sites and our advisory committee for multiple target audiences: AT users, caregivers, clinical teams, community partners, funding agencies, and technological partners. The Quebec Ministry of Health supports our proposal as this will be the first Canadian initiative providing large-scale ongoing monitoring of the clinical impacts of mobility AT funding programs. This will broaden MOvIT+ (refinement and validation of current components, integration of new digital components, specification requirements for scaling up to new sites) and scale it up for dissemination in daily practice.

4. **Project Title:** Indigenous methodologies: building capacity for telediabetes care in Urban Indigenous communities (I'M T'CARE)
Project Lead(s): Charlotte Jones and Donna Kurtz, University of British Columbia
Funding Amount: $597,302
Primary Challenge Area: Health Care & Health Service Delivery

Summary: Representing up to 78% of Indigenous peoples in British Columbia, urban and off-reserve Indigenous people face disproportionately high rates of obesity, diabetes and diabetes-related outcomes secondary to access barriers, racism, structural violence, and lack of culturally safe care. Geographic/jurisdictional challenges also limit access to services such as telediabetes.
Together with six urban and rural Indigenous communities, we will use Indigenous, participatory methodologies to co-develop, implement and evaluate a culturally safe, multidisciplinary Indigenous-led diabetes/weight management telehealth service. Together, we will examine how this care impacts access, health and wellness outcomes for urban Indigenous older adults and caregivers. Indigenous physicians and Nurse Practitioners will be trained as diabetes/obesity "experts", culturally safe multidisciplinary diabetes/weight management onsite clinics will be embedded within Friendship and Métis Center programming and will include an option for virtual home visits; Indigenous older adults, and caregiver/families access and benefit from services; an Indigenous diabetes and obesity "expert" training and implementation toolkit is disseminated across Canada and beyond. The telehealth service is expanded to include other chronic diseases.

5. **Project Title:** Location tracking-based health status indices and their integration into clinical support tools in long-term care
Project Lead(s): Andrea Iaboni and Shehroz Khan, The Kite Research Institute – UHN
Funding Amount: $573,980
Primary Challenge Area: Health Care & Health Service Delivery

Summary: Many long-term care (LTC) homes are starting to use real-time location tracking systems (RTLS) to locate where their residents are at a given time or to find equipment. However, there is an opportunity to use information about someone's movements or walking path over time to tell us something about their health status. For example, individuals' daily walking distance can tell us about their level of activity, or the time spent in the proximity of others can tell us about their social interactions. As such, this study aims to accelerate the use of RTLS in improving health and well-being for older adults living in LTC homes. Like most sensor data, RTLS data is not clinically useful in its raw form; rather, algorithms are needed to transform this information to help clinicians make decisions. In this study, we aim to harness RTLS data to create Space-Time Indices for Clinical Support (STICS). We will validate these STICS and evaluate their use for clinical decision-making. This project also integrates stakeholder consultation and an ethical and policy analysis of the use of RTLS technology in LTC, to allow us to pro-actively address ethical concerns at all phases of development and implementation.

6. **Project Title:** Precision mental health: A stakeholder-informed, Big Data approach to psychological wellbeing
Project Lead(s): Theodore Cosco and Martin Ester, Simon Fraser University
Funding Amount: $474,000
Primary Challenge Area: Health Care & Health Service Delivery

Summary: One in five seniors suffers from some form of mental illness. Lack of attention and support for mental illness not only harms the person, but also costs the healthcare system and economy billions.
Our challenge is to identify: What seniors believe is good mental health and Factors that make and keep a person mentally healthy. Our objectives are to 1) Understand seniors' definitions of good mental health, 2) Identify who is more likely to be at risk and/or showing early signs of poor mental health 3) Link people with help and support specific to their needs. Our project will use detailed information about the lives of thousands of people, collected in large study of aging, and advanced computer programming, such as machine learning. Rather than using traditional statistics that are only able to determine how a few variables are related to another, we will use machine learning to determine how many variables interact and relate to mental health. This will lead to the development of an "early-warning system" identifying seniors at risk and connecting them to personalized pathways for better mental health.

7. **Project Title:** Wearable technology implementation and innovation to prevent fall-related hip fractures and traumatic brain injuries in older adults
Project Lead(s): Stephen Robinovitch, Simon Fraser University; Fabio Feldman, Fraser Health Authority; Andrew Laing, University of Waterloo; Kathryn Sibley, University of Manitoba
Funding Amount: $550,000
Primary Challenge Area: Health Care & Health Service Delivery

Summary: Falls cause 95% of hip fractures and 80% of traumatic brain injuries (TBI) in older adults. These injuries are twice as common among older adults in long-term care (LTC) and acute care, than seniors living independently. Falls management in these settings requires complementary strategies to prevent falls, and prevent injury when falls occur. This research program focuses on facilitating the use of proven technologies, and developing new technologies for preventing injuries from falls in older adults. In Project 1, we will work with care providers to co-develop and evaluate strategies to increase uptake with wearable hip protectors. We will build on our success in implementing hip protectors in LTC in BC's Fraser Health Authority (FHA), where hip protectors are worn in 60% of falls, and reduce fracture risk 3-fold. We will adapt and evaluate the FHA hip protector implementation model to LTC sites in Schlegel Villages (SV) in Ontario. In Project 2, we will also co-design and evaluate the usability of wearable technologies to prevent fall-related TBI. Our deliverables include evidence-based strategies for implementing hip protectors in LTC, and wearable devices designed to prevent fall-related TBI. Ultimately, this project will advance the health, safety, and mobility of seniors.**Project Title:** Living More with SMART Technology: Exploring the feasibility, usability, sustainability and scalability of SMART solutions to support increased quality of life in Continuing Care

8. **Project Title:** Living More with SMART Technology: Exploring the feasibility, usability, sustainability and scalability of SMART solutions to support increased quality of life in Continuing Care
Project Lead(s): Susan Kirkland, Dalhousie University; Margaret Szabo, Northwood Group
Funding Amount: $600,000
Primary Challenge Area: Autonomy & Independence

Summary: Older adults value autonomy and independence as key features of healthy aging. Most research to date has focused on maintaining autonomy and independence in community; less attention has been placed on understanding how to maintain autonomy and independence when 'home' is an institutional setting such as long-term care, or within home support programs. The goal of Living More with SMART Technology (LivMoreSMARTech) is to support technology development that improves the independence, functioning, wellbeing and quality of life of older adults in continuing care while remaining affordable and not labour intensive. Our aims are: 1) to understand the lived experience, needs and desires for well-being among older adults with complex conditions in continuing care; 2) to implement and evaluate off-the-shelf technology solutions, individually customized to maximize well-being, that are supported and sustainable; and 3) to understand how best to incorporate sustainable, person-centred technology solutions into continuing care settings that result in scalable outcomes including adoption into organizational policies, procedures, programs and care planning. LivMoreSMARTech takes a person-centred co-design approach to achieve its objectives, and utilizes the action research cycle of planning, acting, evaluating and reflecting in order to continuously refine our understanding of the research problem.

9. **Project Title:** SMART - Socially Mobile Assistive Robots for Telecare and Daily Activities of Older Adults
Project Lead(s): François Michaud, Université de Sherbrooke; Goldie Nejat, University of Toronto
Funding Amount: $575,000
Primary Challenge Area: Autonomy & Independence

Summary: Socially Assistive Robots (SARs) can uniquely provide assistance to human users through social interaction. A great variety of SARs for elderly care have been designed, tested and evaluated, and even though they demonstrate great potential, they still only remain research endeavors. Why? Many factors come to play, such as the cost and investment required to bring to market and maintaining these robots, finding the right application where user expectations and SARs' capabilities are both met, and providing compelling evidence to help propel the necessary changes to policies and regulations to support their use in real world settings. The SMART core project aims to set up the needed environment to evaluate SAR technologies through field trials in long-term residences and homes. Doing so will help identify needs, requirements and barriers, which will orient technological research activities, through iterative co-design cycles with incremental refinement and exploration. We also want to help move policy makers beyond what are frequently reactive responses to technological breakthroughs, by identifying settings and frameworks that will facilitate a more timely and effective transfer of knowledge from the SAR research community to decision makers.

10. **Project Title:** Advanced Technologies for Pain Care in Older Adults with Dementia
Project Lead(s): Thomas Hadjistavropoulos, University of Regina; Babak Taati, The Kite Research Institute – UHN
Funding Amount: $550,000
Primary Challenge Area: Cognitive Health & Dementia

Summary: Despite its high frequency, pain in older adults is under-assessed and undermanaged. Seniors with severe dementia have difficulty communicating the subjective state of pain due to cognitive impairment. Pain in this population leads to responsive behaviours that are often misattributed to psychiatric disturbances, resulting treatment psychotropic rather than analgesic medication. Psychotropic medication has been shown to hasten death and increases fall risk. Our work will improve pain care in older adults with dementia who have limited ability to communicate their pain. We are working on the following technologies and areas: A)Development of computer vision systems to monitor pain behaviours and warn long-term care (LTC) staff when pain appears to be present in seniors with severe dementia. This improved diagnostic tool is intended to work as LTC residents go about their daily routines; b)Tablet app development and refinement to facilitate the monitoring and recording of pain behaviours by LTC staff; c)Refinement and dissemination of interactive web-based platforms capable of providing cutting edge pain education to LTC staff in rural and remote areas; d)public policy and large scale knowledge mobilization to facilitate adoption of our solutions and to address practice and policy gaps in senior care.

11. Project Title: Technologies for assessment and management of wayfinding risks for persons living with dementia in their communities
Project Lead(s): Lili Liu, University of Waterloo
Funding Amount: $600,000
Primary Challenge Area: Cognitive Health & Dementia

Summary: It is commonly known that 3 out of 5 people living with dementia will wander. The consequences can vary and include minor injuries, high search and rescue costs. If not found within 24 hours, there is a high chance of injury or death. The purpose of this proposal is to examine the application of technologies for assessment and management of wayfinding risks among persons living with dementia in their communities. We propose four studies. Impacts are seen through five products: (1) a reliable and validated measure that predicts risks of going missing, (2) a mobile app that uses the predicted risk levels to recommend a personalized strategy for people with dementia and their care partners to mitigate these risks, (3) a brief scale to assess the usability of technologies used to locate a person who is missing, (4) a national coordinated strategy for the collection of data on missing older adults to inform programs, product designs, and policies, and (5) algorithm-informed search using unmanned aerial systems (UAS) for finding missing or lost persons living with dementia.

12. Project Title: Monitoring My Mobility (M3): A mobility self-monitoring tool for older adults and their caregivers
Project Lead(s): Marla Beauchamp, Brenda Vrkljan, Qiyin Fang, Paula Gardner, Ayse Kuspinar, Paul McNicholas, Bruce Newbold, Parminder Raina, Julie Richardson, and Manaf Zargoush, McMaster University
Funding Amount: $600,000
Primary Challenge Area: Mobility & Transportation

Summary: Problems with everyday mobility, such as walking and driving, are common as we age and can negatively affect health and well-being. Our consultations with older adults and caregivers revealed a clear interest in using wearable tracking devices to self-monitor mobility as a vital health indicator. However, there is currently no wearable that comprehensively monitors mobility and that is valid for predicting important health outcomes in older people. In our research, we will customize a wearable sensing device (i.e., smartwatch) to monitor different aspects of mobility (e.g., steps, distance travelled) in a group of 1500 community-dwelling adults, 65 to 80 years old. Participants will wear the smartwatches for 1-week intervals every few months throughout the 2-year study period. Additional health measures will be captured through in-person assessments, quarterly phone calls, and monthly diaries. Machine learning and advanced statistical methods will be used to identify trajectories of change in mobility over time and how these trajectories relate to important health outcomes. With input from older adults and caregivers, we will then design a mobility self-monitoring tool. Ultimately, our goal is to develop a tool that can help prevent or delay mobility problems in later life by facilitating early detection and treatment.

13. **Project Title:** The use of automated vehicle technologies by individuals with dementia: A potential tool for delaying complete driving cessation
Project Lead(s): Jennifer Campos, The Kite Research Institute – UHN
Funding Amount: $106,000
Primary Challenge Area: Mobility & Transportation

Summary: With road-safety on one side and serious consequences of driving cessation for individuals on the other, driving cessation is considered one of the most challenging issues in dementia. The prospect of Automated Vehicles (AVs) has generated excitement about their potential to solve the problem of driving cessation for persons with dementia (PWD) who can no longer drive safely. However, this prospect is compromised by concerns about PWD's acceptance of AVs and the safety of PWD's use of different types of AVs. In this multi-phase study, we will investigate the current perceptions of PWD and care-partners of AVs, develop and refine educational material on different AV types and functionalities for use by PWD and care-partners, and investigate the safety of using different AV types by PWD. In the first phase of the study, we will conduct semi-structured interviews with PWD and care-partners about their perceptions of AVs. During the interviews, we will present participants with the initial version of the educational material on AV functionalities. The results of this phase will shed light on the current PWD's perceptions of AVs and help to refine the educational material of AV functionalities. In the second phase, we will use Canada's most advanced driving simulator to test the safety of different AV types for use by PWD. The results of this project will be instrumental in clarifying whether AVs may offer a safe and acceptable method of delaying the need for complete driving cessation in PWD.**Project Title:** Introducing New Technology to Monitor the Health Data of Older Adults With Multi-Morbidities Related to Dementia in Indigenous Communities

14. **Project Title:** Introducing New Technology to Monitor the Health Data of Older Adults With Multi-Morbidities Related to Dementia in Indigenous Communities
Project Lead(s): Megan O'Connell, University of Saskatchewan
Funding Amount: $575,000
Primary Challenge Area: Healthy Lifestyles & Wellness

Summary: The Morning Star Lodge, in collaboration with their community partner, the File Hills Qu'Appelle Tribal Council (FHQTC) will utilize 3 new technologies to be introduced to Indigenous older adults in a research project to monitor health status. Indigenous older adults living in rural communities have multiple health issues that may lead to early onset dementia, yet they lack the accessibility to and readiness for new technologies to monitor health data and health status. Health education is needed to understand the ways nutrition, exercise and self-management of health issues can impact multiple diseases (primarily around diabetes and heart disease) and how these health issues can be related to early dementia onset. Working with our community partner we will introduce and evaluate 3 new technologies to thirty participants to monitor diabetes and age-related health information, including blood glucose, blood pressure, weight, and other data which includes a non-invasive blood glucose monitor to provide needle free diabetes care; a blood pressure monitor; and a smart scale/body analyzer to measure body fat, water percentage, muscle mass and bone body mass index (BMI). The impact of using these technologies to monitor health data and promote healthy behaviours and healthy lifestyles will be documented.

15. **Project Title:** Inclusive Interactive Apps to Reduce Older Adults' Social Isolation and Digital Marginalization
Project Lead(s): Cosmin Munteanu, University of Toronto
Funding Amount: $575,000
Primary Challenge Area: Staying Connected

Summary: Older adults increasingly report being socially isolated – potentially affecting many aspects of fulfilling, healthy, and safe golden years. Concurrently, advances in mobile, connected, and smart technologies afford new opportunities to maintain meaningful ties with our loved ones or with our community peers, or to simply increase our quality of life by making access to services and products much easier. To this extent, older adults who live socially isolated could benefit from a greater digital participation. Yet, the current ecosystem of design paradigms, interfaces, digital services, and knowledge marginalizes and excludes many older adults. In our community-driven design research, we aim to break this cycle of digital marginalization / social isolation and empower older adults to live more independently and socially more connected. For this, we establish a new transdisciplinary model of sustainable and ethical design and validation of senior-centred digital tech, based on collaborations between diverse academic investigators, users, community stakeholders, and industry. Our resulting products consist of a set of new interactive and interconnected applications, deployed on emerging platforms (voice-first, mobile, VR, tabletop), that empower older adults' to participate in the digital space, reduce social isolation, and facilitate meaningful connections to family members.

16. **Project Title:** *AccèsCan | CanAccess*: A social enterprise promoting the digital inclusion of older adults with cognitive disabilities
Project Lead(s): Virginie Cobigo, CHEO, University of Ottawa
Funding Amount: $100,000
Primary Challenge Area: Financial Wellness & Employment

Summary: Information technologies such as mobile applications and social robots offer exciting new opportunities for promoting the autonomy, independence, and social inclusion of seniors with cognitive disabilities (CD) - a population of over 1,500,000 Canadians. Yet many older adults with CD are unable to fully benefit from technological advances because technologies are not accessible to them. They may also be vulnerable to privacy threats, and their use of technology is influenced by caregivers and professionals who may limit access due to safety concerns. The COVID-19 pandemic has exacerbated their social and digital exclusion: seniors with CD have limited access to means of virtual communication, and most critically, they have limited access to life-saving public health information. Iincorporated in April 2020, CanAccess is a social enterprise offering a one-stop shop for organizations that wish to make their products or services accessible to persons with CD, including the IT sector. It also supports academics in their efforts to make research with persons with CD more accessible and ethical. Seeded by AGE-WELL and the prestigious New Frontiers in Research Fund (NFRF), we developed a cutting-edge protocol to test and improve the cognitive accessibility of technology, and make R&D processes inclusive and ethical. Our social enterprise takes the crucial and necessary step of involving and employing persons with CD in our unique process. Our multidisciplinary team led by uOttawa's Virginie Cobigo, PhD, is set to mobilize a vast network of community partners supporting persons with CD, technology developers, and policymakers. CanAccess will accelerate the delivery of ethically-sound and accessible technologies for older adults with CD, and their caregivers, in both official languages.

17. Project Title: CogWorks: Co-Creating Sustainable Workspaces for Aging Workforces
Project Lead(s): Arlene Astell, University of Toronto; Jennifer Boger, University of Waterloo; Josephine McMurray, Wilfred Laurier University
Funding Amount: $550,000
Primary Challenge Area: Financial Wellness & Employment

Summary: In 2015 the United Nations identified "full and productive employment and decent work for all" as one of its Global Goals for Sustainable Development. Cog@Work is examining how Canadian workplaces approach employees who develop mild cognitive impairment or early-stage dementia (MCI/Dem) to identify gaps, model sustainable workspaces, and develop novel supportive technologies. Our work will explore employers' accommodations of employees consistent with existing disability legislation and the immediate and long-term wishes and aspirations of people with MCI or early dementia in relation to staying at work or transitioning out. We have partnered with employers, employees, healthcare, insurance, lawyers, policy makers and other stakeholders to identify facilitators and barriers to sustained employment for those diagnosed with MCI/Dem on the job. The outcome of Cog@Work will be threefold: 1. A model of current and optimal workspaces for employees with MCI/Dem; 2. A policy agenda addressing current gaps and drivers for developing sustainable workspaces; and 3. Requirements for employer-facing technology innovations to support sustainable workspaces. Products will include a Cog@Work website and resources including organizational case studies, sustainability models to demonstrate economic and social return on investment, prioritized product requirements, and a national support network of organizations with sustainable workplaces.

18. Project Title: Enhancing Employability of Older Workers and Family Carers
Project Lead(s): Janet Fast, University of Alberta
Funding Amount: $593,697
Primary Challenge Area: Financial Wellness & Employment

Summary: Financial well-being is foundational for individuals' physical, mental and social wellness, as well as their engagement and productivity as workers. Secure employment is key to financial well-being, yet many in society experience employment instability: job loss, underemployment, precarious employment, poor quality jobs. Two vulnerable groups that have received little attention are older workers and family carers. The proposed project will enhance an existing cloud-based prototype platform and online vocational guidance tool (My MatchWork (MW)) designed to help overcome employment barriers for these two vulnerable populations and extend its reach beyond Alberta. MW is a Software-as-a-Service application comprising a machine learning-informed interactive vocational guidance tool. Coupled with ongoing training and support from MW staff, the tool delivers beneficial customized employment profiles for individuals, good matches for employers, and outcome data agencies need to support vocational initiatives. MW is currently beta testing the tool and support package with community partners. We will use multiple data sources (national purpose-built surveys; interviews with older workers, carers and potential employers; MW intake data) to generate knowledge that: contributes to the body of knowledge; enhances the platform's ability to address carers' and older workers' employment challenges; and demonstrates the platform's impact on labour market success of the target populations.

AGE-WELL Platform Project Awards 2020-2023

1. **Project Title:** A Smart Home System for Persons with Cognitive Impairment
Project Lead(s): Rafik Goubran, Carleton University; Neil Thomas, Bruyere Research Institute
Funding Amount: $300,000
Primary Challenge Area: Supportive Homes and Communities

Summary: Current methods to assess individuals with cognitive impairment rely on information provided in a clinic setting at periodic intervals. New technologies offer the possibility of objectively detecting changes in cognition, physical health and functional status by collecting ecologically valid information in a home setting. The ability to accurately and unobtrusively measure these changes could provide meaningful information to an older adults and their family. New data analysis techniques to evaluate sensor-based information could help to better identify needs for changes in care management. The goal of this project is to develop and test new methods to detect functional changes in individuals with cognitive impairment in the home setting. Our aims are to:1. Review sensors currently used in an internationally recognized home-based assessment platform and examine how AGE-WELL supported sensors solutions could be added. 2. Obtain feedback from system users and older adults to gain further insight on priorities for data collection, data use, and smart home responses. 3. Initiate development of real-time feedback capabilities within the sensor platform that could be used to inform individuals and health care professionals. Ultimately, home-based sensor systems could be used to support aging in place and delay transitions to institutionalize care.

2. **Project Title:** An Open Platform of Serious Games for Cognitive Assessment and Intervention
Project Lead(s): Eleni Stroulia, University of Alberta
Funding Amount: $300,000
Primary Challenge Area: Cognitive Health and Dementia

Summary: Computer games are increasingly used as a tool for studying cognitive skills and ageing. Our team developed a set of games that can be played on tablets. We established that these games (a) are easy-to-use and engaging for older adults with and without dementia, and (b) older adults with dementia can become better on their cognitive skills at playing them. As such, they could potentially be used for cognitive-skill training. It is now time to proceed with an in-depth investigation of the effectiveness of these games, and whether and how we might enable the transfer of skills learned through game playing to the older adults' functioning in their daily activities. This research project will deliver a software platform that will enable researchers to conduct studies to (a) validate software-defined indicators of cognitive function, and (b) measure the effectiveness of game-based interventions on cognitive function and relevant health-related and real-life outcomes. The results will provide new knowledge about the availability of new technology for cognitive assessment and interventions, and its success. These will serve as the foundation for recommendations about the administration of cognitive assessments and interventions using computer games, which, in turn, will advance the current state of practice

3. **Project Title:** Building technology-enabled, aging-focused rapid learning health systems in Canada
Project Lead(s): Michael Wilson and John Lavis, McMaster University
Funding Amount: $550,000
Primary Challenge Area: Health Care & Health Service Delivery

Summary: Harnessing the innovative technologies developed through AGE-WELL (e.g., to capture, link and share data about key indicators such as patient experiences, clinical encounters, costs and health status) is critical for enabling rapid-learning health systems (RLHS). RLHS refer to the combination of a health system and a research system that at all levels – self-management, clinical encounter, program, organization, regional (or provincial) health authority and government – is: anchored on the needs, perspectives and aspirations of the people it is designed to serve; driven by timely data and evidence; and supported by appropriate decision supports and aligned governance, financial and delivery arrangements; and enabled with a culture of and competencies for rapid learning and improvement.

Our overall goal is to spark action towards building technology-enabled RLHS for the aging population in Canada and will pursue two specific goals: identify in-depth insights about current community 'best practices' in aging for RLHS; and to spark collective action based on citizens' values and preferences and stakeholders' insights for building a technology-enabled RLHS in the aging space. For goal 1, we will conduct qualitative case studies of purposively selected 'best practices' related to aging in Canada by identifying whether, how and with what impact they have used technology to enable an RLHS approach. For goal 2, we will convene four citizen panels in Canadian regions followed by stakeholder dialogues with leaders who can provide unique insights as well as champion the changes needed to support and ultimately build technology-enabled RLHS in aging. The potential for cross-jurisdictional impact is significant. The tangible insights from our analyses will be essential for decision-makers to make the investments and/or transformation needed for implementing RLHS for the aging population in Canada. This will position AGE-WELL at the forefront of championing a highly innovative approach to strengthening health systems across Canada.

4. *Project Title:** PATH: Program to Accelerate Technologies for Homecare
Project Lead(s): Atena Roshan Fekr and Geoff Fernie, The Kite Research Institute – UHN
Funding Amount: $300,000
Primary Challenge Area: Supportive Homes and Communities

Summary: One of the biggest challenges that AGE-WELL faces is helping older people continue to age in their own homes despite the increasing prevalence of chronic disease. There exists a gap between the development of the homecare technologies and their commercialization and adoption. Beneficial technologies may never reach their end-users because of factors associated with the innovation life cycle like heavy costs, and the lack of expertise and resources. We proposed a Program to Accelerate Technologies for Homecare (PATH) which enables different technologies to be developed, integrated, tested, and commercialized. The PATH platform will provide a cost-effective nationwide testing and optimization service that will accelerate the availability of beneficial technologies. The technologies that progress through the program will be evaluated for real-world impact through our partnership with SmartOne. Notably, using the large collection of data the platform yields, Artificial Intelligence (AI) models can be developed and trained, further enhancing the accuracy of data interpretations. Therefore, the proposed platform will provide a global connectivity management system where any type of smart home system and home health device can be seamlessly integrated for testing and validation. The novel techniques will improve the sensitivity of diagnosing the health condition changes while reducing false alarms.