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.