Collaboratory for Digital Health Innovations

UVic Digital Health Innovations and Support

Purpose:

To explore the potential for UVic-based software development for iOS/Android and web-based apps for digital health science innovations.

Benefits:

Continuity of development, maintenance, and support for UVic (and external researchers); Lower cost. Potential for external funding from non-UVic users.
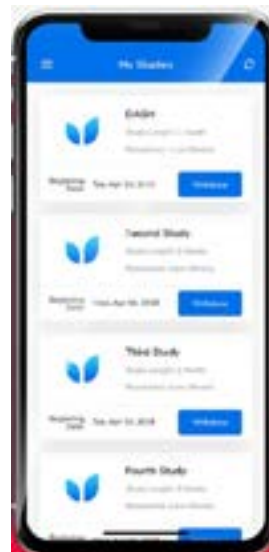
MyCogHealth Assessment Platform

Leads: Jonathan Rush & Scott Hofer; Freshworks Studios

MyCogHealth was developed to provide a self-administered, reliable, efficient, and low cost approach for more accurately detecting subtle cognitive change.

Our program of research provides a basis to identify optimal designs, eConsent processes for remote assessment, and psychometric validation for use as an assessment tool in primary care settings, evaluation of efficacy of dementia prevention programs and to improve outcome sensitivity in clinical trials. The MyCogHealth app permits ecologically valid assessments of cognitive functioning, dementia risk factors, modifiable health behaviors and other patient-reported outcomes by capturing these processes throughout an individual's daily life, where and when it matters, providing a basis for individual interventions to maintain cognitive vitality. MyCogHealth is available across mobile devices (iOS and Android) and the flexible backend, scheduling features, and range of question types make it a useful tool to support research with various design needs and substantive focus across fields and disciplines.

We have achieved Technology Readiness Level 7, having completed the simulation phases with extensive testing by software developer Freshworks Studio and within our lab using various protocol administrations. The app is deployed at McGill University and administered by the LORIS/CCNA platform team for use in the CCNA CanThumbsUp Trial. We have ethics approval for longitudinal validation studies involving community members (subjective cognitive decline, cognitive normal; including recruitment from primary care sites) and have modified these protocols for completely remote recruitment, eConsent, and deployment. We expect deployment in May, 2021.

Click here for a demo

https://www.youtube.com/watch?v=6bHlIdnl2GQ

UVic Collaborations:

The MyCogHealth platform will be an integral part of a number of research programs within the Department of Psychology and has been included as a key piece in multiple grant applications.

• Theone Paterson (PI),
The impact of dietary and physical activity mHealth apps and their utility in the Canadian context: Person-centered and psychosocial predictors and outcomes, SSHRC Insight Grant

• Megan Ames,
Day-to-day variations in health behaviours and academic success: Gateways and barriers to healthy lifestyles in undergraduates, SSHRC Insight Development Grant

• Mauricio Garcia-Barrera,
Executive Function Improvement Training (eFIT) project, CIHR funded

• Jody Gawryluk,
Feasibility of Mobile Cognitive Assessments in a Seniors Outpatient Population
o Study linking MyCogHealth data to fMRI data

• Collaborative Health Grant,
An Examination of Stellate Ganglion Block for Post-Traumatic Stress Disorder: An Intensive Measurement Study

• Danu Stinson
o Graduate student project:
Relationship between daily experiences of social identity threat and daily self-group distancing among female military members

International Collaborations:

• Pär Bjälkebring & Magnus Lindwall, University of Gothenburg, Sweden
o Will be carrying out a parallel study as our UVic MyCogHealth longitudinal validation study in Gothenburg, Sweden to permit cross-country comparisons

• Graciela Muniz-Terrera, University of Edinburgh
o National surveillance study of older adults in Uruguay

Digital Health Web-based Development platform

Leads: Sam Liu & Ryan Rhodes

Our team has created a suite of web-based behaviour health interventions aimed to promote healthy living. The platform enables practitioners to create interactive web-based intervention by using "drag-and-drop" features. This platform has enabled our team to apply the Multi-Process Action Control Framework (M-PAC), developed by Dr. Rhodes. M-PAC is a unique behaviour change model in that it is a layered approach that incorporates intention formation and translation, adoption and maintenance and dual processes of motivation. Our team has created a suite of web-based behaviour change intervention over the past 2 years using the Digital Health Web-based Development platform and the M-PAC framework. These programs includes: a childhood obesity management program, a healthy living program aimed to help families promote healthy living during the COVID-19 recovery, physical activity program for new parents and a healthy lifestyle program for university students. Our team has already published multiple peer-reviewed manuscripts1–7 and generated over $650,000 of external funding ($500k CIHR; $150k MITACS/External Contracts/Internal Grants) over the last 3 years from this project.

Click here for a demo
https://digitalhealth.uvic.ca/eip/portal

Username: EIP
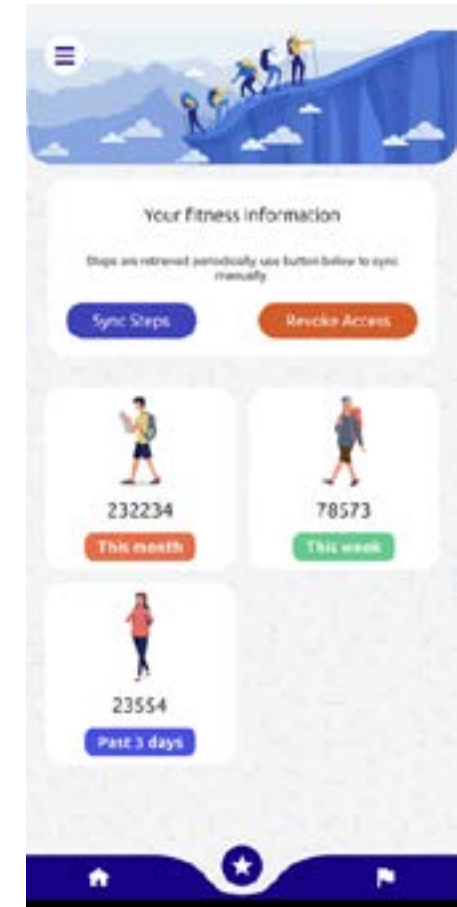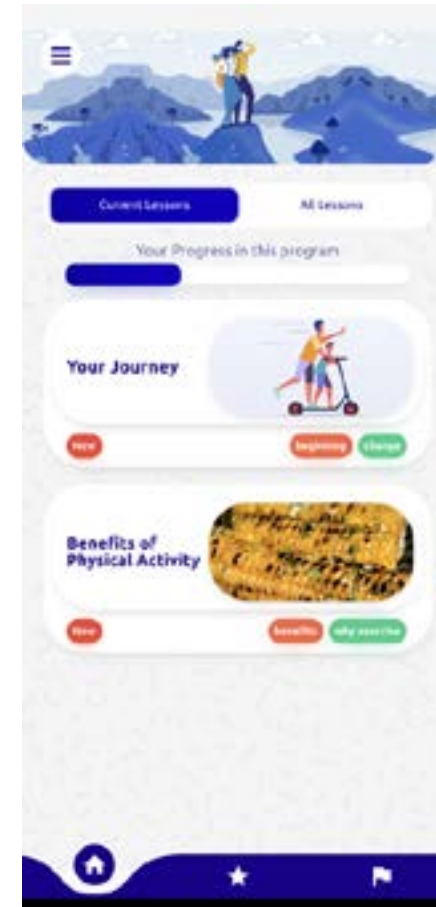Password: EIP

Pathverse Mobile App Development platform

Leads: Sam Liu & Ryan Rhodes

The Pathverse platform enables researchers to rapidly prototype and deploy Apps with a combination of interactive features (e.g. videos, quizzes, wearable integration, surveys). Pathverse platform consists of a researcher admin web-portal and a participant smartphone App. The web-portal offers the flexibility for researchers to design a wide variety of physical activity promotion smartphone apps with a combination of interactive features (e.g. gamification, quizzes, wearable integration, decision-tree algorithms) by using "drag and drop" features. This will allow anyone with no prior computer programming skills to build smartphone Apps; thus, significantly decrease app development resources. The changes made to the app in the researcher web-portal are immediately reflected in the participant App. The Pathverse platform has the ability to change app content dynamically without publishing a new version of the app in the app store. Therefore, this innovative feature enables our team to rapidly deploy and conduct ongoing usability testing to fine-tune our app design
Our platforms have allowed health

researchers to significantly reduce the resources required to develop, evaluate and disseminate web-based and mobile health interventions. Our platforms are currently being beta-tested by researchers from 17 different academic institutions (see below for a list of collaborators). We believe our platforms will be a tremendous asset for the UVic health initiative to establish research collaborations and secure external research funding.

Collaborators:

Sick Kids UofT; UBC; Toronto General Hospital, UofT; B.C healthy living; Childhood Obesity foundation; YMCA; Integratehealth B.C; Symmetrix Exercise & Rehab B.C.; University of Alabama at Birmingham, USA; St. Jude Children's Research Hospital, USA; Dartmount college, USA; Brown university, USA; Cooperhealth University Care, USA; The University of Texas MD Anderson Cancer Center, USA; City University of New York, USA; The University of Texas MD Anderson Cancer Center, USA; University of Louisville, USA; University of South Carolina, USA.

See a demo of the app by downloading the app from Apple or Google play store

Demo username: digitalhealth@uvic.ca
Password: digitalhealth

Punjabi Type 2 Diabetes App for IPhones

Leads: Patrick McGowan & Scott Hofer; Ayogo

The initial phase of the project involved a comprehensive literature review of the effectiveness of apps for type 2 diabetes. Then, focus groups were conducted with Punjabi adults with type 2 diabetes who had completed a Diabetes Self-Management Program (IALH Ladner Office; Associate Director Patrick McGowan). The focus group interviews elicited views and opinions on the creation of a Punjabi Self-Management app to complement existing care. Four focus groups were conducted involving 59 persons. When focus group data were collected, the team identified what people believed were the essential components of the app. Ayogo Health, the study's industry partner, provided anonymized data from focus groups and started to develop the app on their platform.

An app has been developed. This personalized app tailors content to users' specific needs. During account setup, users select a problem they want to work on and complete a short self-efficacy questionnaire on managing diabetes. Then, the app provides educational content based on problem selected. Subsequently, users learn to use a problem-solving process and learn how to make an action plan to resolve the problem. On a daily basis, for the remainder of the week, the app sends specific educational content related to the identified problem. After one week, the app checks in with users to see how they made out with their action plan. If completed, they are congratulated and offered another problem area to explore. If users were not able to complete the action plan, a problem-solving process is used and users identify ways to resolve why they couldn't complete their plan, and then a new action plan is established.

App features include: 100% in Punjabi, Punjabi text and audio, easy-to-understand, an app tutorial, diabetes self-efficacy and knowledge questionnaires, 16 educational presentations along with additional educational articles and videos, reflection questions at the end of each educational presentation, three core self-management strategies, Canadian diabetes resources, a personalized daily presentation of content, and short self-reflection quizzes on ability to manage diabetes.
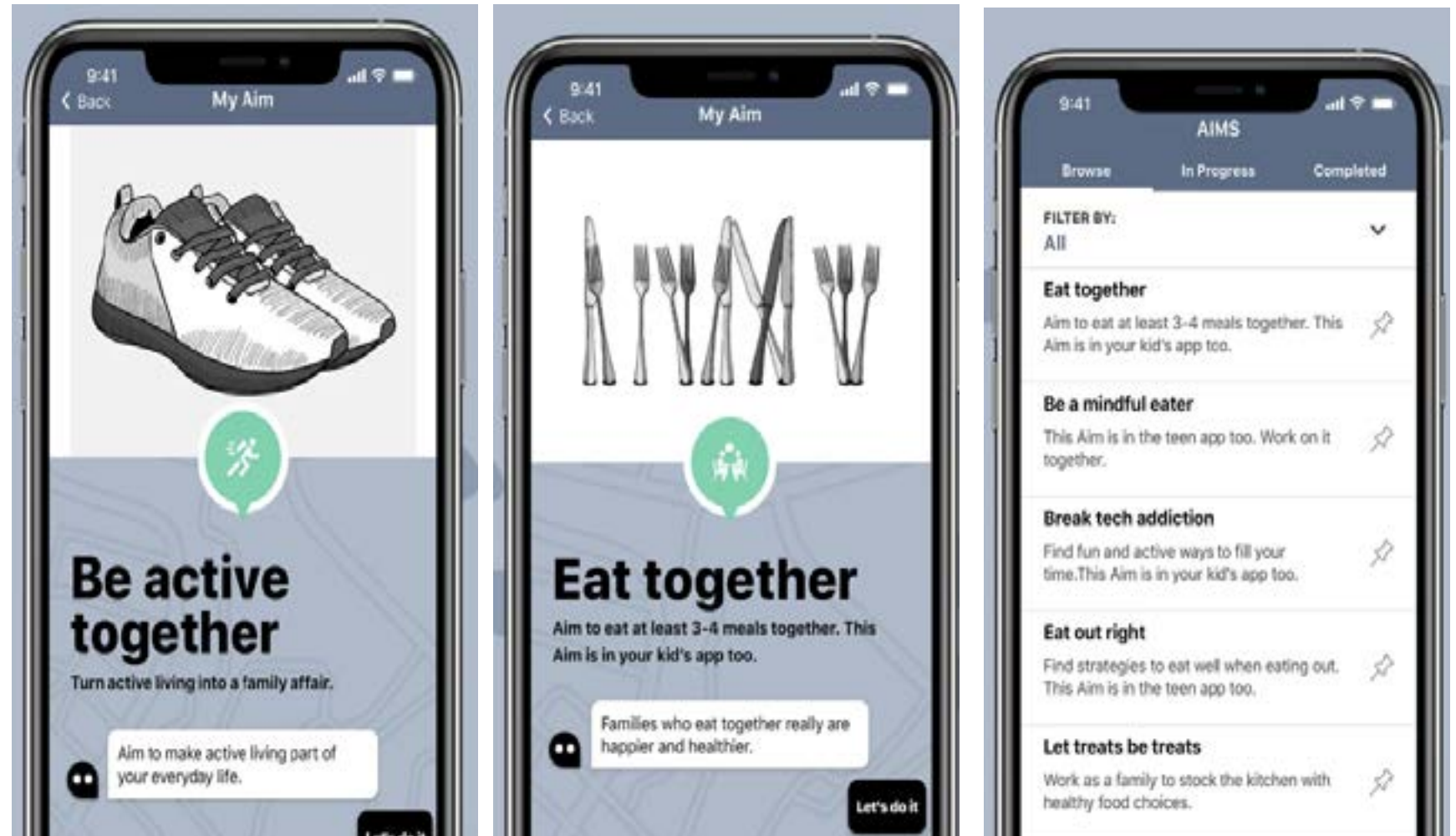
See a demo of the app by downloading the app from Apple or Google play store.

Aim2be

Leads: Sam Liu, Louise Masse, Childhood Obesity Foundation

Aim2Be is an app designed to help youth and their families adopt healthy behaviours in four areas – healthy eating, physical activity, screen time and sleep (https://aim2be.ca/). The app was developed in collaboration between UBC researcher Dr. Louise Masse and the childhood obesity foundation and Ayogo Health. The app is currently undergoing a CIHR randomized controlled trial. Digital Health Lab at UVic has recently been contracted to take over the maintenance and continued development of the app over the next year.

The funding model used for this project can be replicated to create a sustainable UVic Digital Health Development Team.

References:

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7. Liu S, Tanaka R, Barr S, Nolan RP. Effects of self-guided e-counseling on health behaviors and blood pressure: Results of a randomized trial. Patient Educ Couns. 2019.