



THE UNIVERSITY OF BRITISH COLUMBIA

Analytics in Medical Sciences Institute
Okanagan Campus

Annual Report 2023-2024

IMPACTFUL AND RELEVANT ADVANCEMENTS IN HEALTHCARE





THE ANALYTICS IN MEDICAL SCIENCES (AIMS) INSTITUTE

The central aim is to formally unite a network of researchers working in the areas of medical physics, imaging, engineering, mathematics, oncology, informatics, and data analytics for the expressed purpose of developing locally relevant and globally impactful advancements in healthcare. While not restrictive, the primary initial efforts within AiMS are centred on the following healthcare areas:

- Radiation medicine in cancer care
- Traumatic brain injury (TBI)
- Multiple sclerosis (MS)

Mission

Our mission is to address major healthcare issues of the coming decades through integrated research and the training of next generation researchers in biomedical physics, data analytics, oncology, and biomedical engineering.

Vision

To create SMART **HEALTHCARE SOLUTIONS OF LOCAL RELEVANCE AND GLOBAL IMPACT.**



AIMS MEMBERS

				UBC DEPT.
Andrews, Jeff	PhD	Statistics	UBCO	CMPS
Batchelar, Deidre	PhD	Medical Physics	BCC	CMPS
Becker, Nathan	PhD	Medical Physics	BCC	CMPS
Bjarnason, Thor	PhD	Medical Physics	IH	CMPS
Braun, John	PhD	Statistics	UBCO	CMPS
Carlone, Marco	PhD	Medical Physics	BCC	CMPS
Crook, Juanita	MD	Radiation Onc.	BCC	F. Medicine
Davidson, Melanie	PhD	Medical Physics	UBCO	CMPS
DiLabio, Gino	PhD	Chemistry	UBCO	Chemistry
Feldman, Rebecca	PhD	Medical Physics	UBCO	CMPS
Hare, Warren	PhD	Mathematics	UBCO	CMPS
Haston, Christina	PhD	Medical Physics	UBCO	CMPS
Hilts, Michelle	PhD	Medical Physics	BCC	CMPS
Hoehr, Conny	PhD	Physics	TRIUMF	CMPS
Holzman, Jonathan	PhD	Engineering	UBCO	SOE
Hyde, Derek	PhD	Medical Physics	BCC	CMPS
Jirasek, Andrew	PhD	Medicals Physics	UBCO	CMPS
Li, Isaac	PhD	Chemistry	UBCO	Chemistry
Milani, Abbas	PhD	Engineering	UBCO	SOE
Sepideh Pakpour	PhD	Engineering	UBCO	SOE
Rasika Rajapakshe	PhD	Medical Physics	BCC	CMPS
Teke, Tony	PhD	Medical Physics	BCC	CMPS
Thompson, John	PhD	Statistics	UBCO	CMPS



ACADEMIC MEASURES—AT A GLANCE

The academic measures reported in this section are based on the information collected from members on their academic records from September 2023 until August 2024.

Number of Institute Members: 23

Research Publications (2023): 74

Conference Presentations and Abstracts (2023): 89

Number of Graduate and Postdoctoral Trainees: 54

Research Funding: >\$2.3M

RESEARCH, COLLABORATIONS AND CLINICAL ACCOMPLISHMENTS

- A highly interdisciplinary project (between AiMS and MMRI) was formed through School of Engineering (UBCO), Department of Nursing (UBCO), Department of Computer Science (UBCO), School of Engineering (RMIT University, Australia), College of Education (California State University-Fullerton, USA). The work, as a case study introduced a mixed reality (MR) platform along with data analytics for intravenous (IV) infusion training. Our research team explored the effectiveness of the MR-based Student Directed Learning (SDL) tool by employing four communication modes (computer agent-text, agent-audio, human-text, and human-audio) and assessing their impact on senior nursing students during a study session. The study with eight senior nursing students, followed thirty minutes of assembly instructions and a fifteen-minute questionnaire, and included subjective assessments of various factors such as trust, reliability, usefulness, satisfaction, and ease of use. The results highlighted the superiority of the agent-text mode with respect to all the factors.
- Jason Reich won Stefan E Fischer Award for best new pulse sequence
- BC Cancer used Gel Dosimetry to commission Stereotactic Radiosurgery so that patients could receive these treatments in a single fraction here in the Okanagan (rather than traveling to Vancouver or opting for a simple palliative treatment here). Also introduced the Virtual Cone technique to treat Trigeminal Neuralgia.



- BC Cancer Collaboration with Varian physicists to create a workflow for Spatially Fractionated Radiation Therapy (Lattice). As well, collaboration with Vancouver RO for radiomic analysis of SABR-5 data.

HIGHLIGHT ACTIVITIES

AiMS is a new Institute and, as such, our activities in the past year have centred around foundation building. Our launch activities have included:

- Development of an Institute website (in progress)
- Work on data-sharing and transfer protocols between BC Cancer and UBCO for disparate data types, starting with medical physics related areas.
- Work with UBCO Foundation for building of AiMS-related donor partnerships.
- Development of an undergraduate degree in radiation therapy. This is envisioned to be a jointly offered, experiential program between BC Cancer and UBCO.