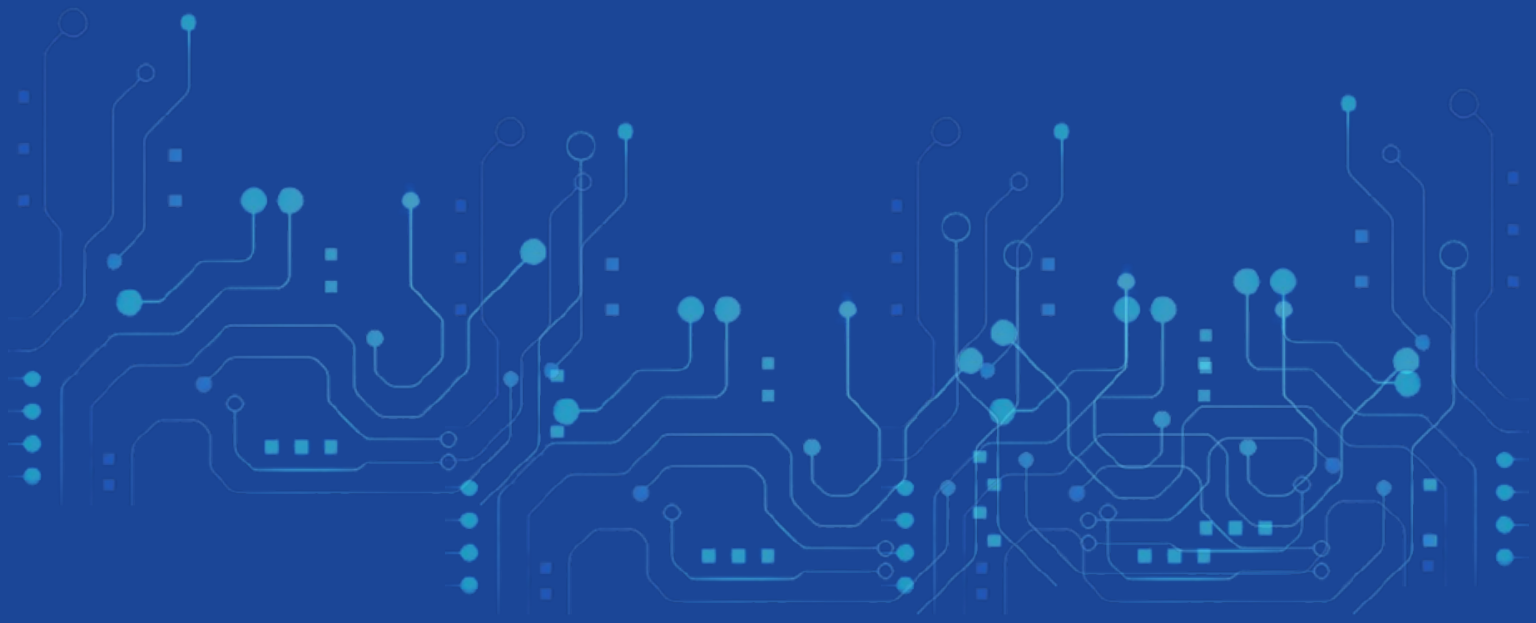
UBC SUPERCLUSTER RESEARCH DAY



THE UNIVERSITY OF BRITISH COLUMBIA

School of Biomedical Engineering
Faculty of Applied Science | Faculty of Medicine

Virtual artificial intelligence (AI) research presentations by UBC learners from the Faculty of Medicine and School of Biomedical Engineering, supported by Canada's Digital Technology Supercluster (CDTS).

ZOOM Registration

23 November 2023
12:00 PM to 2:00PM

OPENING REMARKS & KEYNOTE

12:00 - 12:40 PM

- Opening Remarks & NAICH update
  Dr. Bruce Forster & Dr. Deepak Kaura
  12:00 - 12:10 PM
- Keynote *Dr. Roger Tam 12:10 - 12:30 PM*
- Keynote Q & A *12:30 - 12:40 PM*

SYNTHESIS HEALTH PRODUCT DEMO

12:40 - 12:55 PM

- synthAI Chest 2.0 Algorithm Demo *Ali Shademani 12:40 - 12:55 PM*

STUDENT PRESENTATIONS

12:55 - 1:55 PM

- AI-MedEd: Empowering Medical Residents/Fellows on basics of AI through chest Xray case study *Janet He 12:55 - 1:10 PM*
- Exploring the Impact of Medical Image Deidentification on Algorithmic Advancements in Healthcare *Hannah Khan 1:10 - 1:25 PM*
- Systematic Review of AI in Undergraduate Medical Education
  Aryan Ghaffarizadeh & Nikola Pupic 1:25 - 1:40 PM
- AI Prediction of Cardiac Scarring from Electrocardiograms *Julia Handra 1:40 - 1:55 PM*

CLOSING REMARKS

1:55 - 2:00 PM

Dr. Bruce Forster 1:55 - 2:00 PM

STUDENT PRESENTATIONS

Moderator: Dr. Ilker Hacihaliloglu

12:55 - 1:55 PM

Presentation 1

AI-MEDED: EMPOWERING MEDICAL RESIDENTS/FELLOWS ON BASICS OF AI THROUGH CHEST XRAY CASE STUDY

Janet He 12:55 - 1:10 PM

As technology advances, it inevitably becomes intertwined with healthcare. However, within our education systems, there is a clear disjoint between the fields of computational sciences, medical studies and system engineering. This paper hopes to provide some insight to prospective and current radiologists into the world of artificial intelligence. By knowing how artificial intelligence systems for medicine work, radiologists can feel more comfortable and confident implementing these tools into their practices. The training file begins with a brief overview of the history of artificial intelligence in radiology, followed by how we actually train and evaluate imaging algorithms. Finally, the paper ends by exploring a proof-of-concept imaging tool provided by Synthesis Health followed by a discussion surrounding limitations and ethical considerations of artificial intelligence in healthcare. This paper is specifically focused on algorithms designed for chest radiologists.

Presentation 2

EXPLORING THE IMPACT OF MEDICAL IMAGE DEIDENTIFICATION ON ALGORITHMIC ADVANCEMENTS IN HEALTHCARE

Hannah Khan 1:10 - 1:25 PM

De-identification is the process of removing identifying features of an individual's clinical data for medical imaging AI development. However, complete de-identification of demographics in an imbalanced dataset could introduce bias to an algorithm, affecting accuracy and potentially worsening existing health care inequalities. In partnership with Synthesis Health and SapienSecure, the goal is to investigate the impact of de-identification of demographic features in chest x-rays on algorithm performance. Understanding which features impact accuracy would mitigate bias in AI methods and enhance its clinical decision-making. The outcome of this research will aid the development of new approaches and regulatory guidelines for current de-identification methods of medical imaging data.

Presentation 4

SYSTEMATIC REVIEW OF AI IN UNDERGRADUATE MEDICAL EDUCATION

Aryan Ghaffarizadeh & Nikola Pupic

1:25 - 1:40 PM

The exponential growth of artificial intelligence (AI) in the past two decades is widely acknowledged as a significant opportunity to enhance the quality of patient care. However, the integration of AI education within medical programs has been slow to adapt to this technological revolution, leading to a shortage of AI-specific curricula in medical schools. This systematic review aims to assess the existing evidence-based recommendations for incorporating AI education into undergraduate medical training.

A comprehensive literature review identified 991 relevant studies related to AI education within undergraduate medical programs. After applying stringent criteria, 30 studies met the inclusion requirements, with an additional eight studies included through reference mining. Despite the considerable diversity among study types and their respective recommendations, a thematic analysis unveiled six crucial themes essential for the successful integration of AI into medical school curricula.

These six themes encompass ethics, theory, and application, communication, collaboration, quality improvement, and perception and attitude. Further examination of ethics, theory, and application, and communication revealed subthemes, including patient-centric and data-centric ethics, knowledge for practice and communication, as well as communication tailored for clinical decision-making, implementation, and knowledge dissemination.

Survey studies indicated strong support among medical professionals and students for the inclusion of formal AI education in medical curricula. This underscores the need for further research and concerted efforts to advance this educational agenda.

Presentation 3

AI PREDICTION OF CARDIAC SCARRING FROM ELECTROCARDIOGRAMS

Julia Handra 1:40 - 1:55 PM

Myocardial scarring (MS) is the underlying factor for the primary causes of death in heart failure patients: ventricular arrhythmias and progressive left ventricular dysfunction. Currently, cardiac magnetic resonance imaging (CMR) is the most sensitive, albeit expensive and less accessible, technique for detecting MS. In contrast, electrocardiograms (ECGs) are widely available and cost-effective in cardiac care. Our hypothesis is that machine learning-based ECG analysis can predict myocardial scarring. To test this hypothesis, we are assembling a retrospective cohort of 1000 cardiac patients to develop and validate machine learning models that utilize ECG data for predicting MS presence, as assessed by cardiac MRI. Our progress includes substantial advancements in cohort assembly and initial design work for machine learning models, drawing from existing ECG-AI research. This endeavour aims to make MS detection more accessible and cost-effective to improve patient care and outcomes.