



# Athabasca University

## Research Introduction

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# Research fields



- AI and machine learning
- Deep learning, natural language understanding, pattern recognition
- AI and machine learning based solutions for education, business, science, industry, medicine and healthcare (Health Everywhere - MIF)

# Research focuses



- New deep learning models for representing, recognizing, and generating sequential and structured data
- AI and machine learning for medicine and healthcare:

Application scenarios in medicine (regarding medical imaging, ECG, brain EEG, medical records, and other health data) for identifying signals, detecting issues, producing alerts and facilitating communications and interoperability

# Research approaches



- Exploring fundamental, state-of-the-art, and open AI and machine learning problems, methods, models and algorithms
- Studying the mechanisms and optimization of deep representation and learning
- Capturing the semantics, structures, and relations in data
- Learning with textual, signal, sequential, image, and multi-modal data

# Research outcomes



- Solving computational, mathematical, and scientific problems arising from deep learning models, algorithms, and solutions
- Developing AI, machine learning and deep learning methods and solutions for problems from any domains of our interest, as long as they produce, possess, and use data in the process

# What to gain



- Grasping AI and machine learning
- Enhancing research capability
- Achieving meaningful research outcomes in AI, machine learning and their applications
- Facilitating a domain of your interest, including but not limited to medicine and healthcare.

# Who can do



- Curious about why and how AI and machine learning work
- Interested in exploring the mechanisms of the state-of-the-art deep learning models and algorithms
- Passion for advancing AI and machine learning (models, algorithms, solutions)
- Like to practice computational, mathematical and/or scientific thinking
- Eager to solve a specific problem in or with AI and machine learning for your Master's Thesis or Project

# Funding opportunities



- Alberta Major Innovation Fund (MIF) – Health Everywhere:

Developing AI and machine learning methods for solving healthcare and medicine related problems with data (e.g., sequential data, images and languages) from different sources.



# Collaborators



- SCIS and FST professors and researchers at AU
- External researchers of the MIF project (University of Calgary)
- Our supervised graduate students

Calling for graduate students who are interested in exploring and advancing their AI and machine learning ability in processing and understanding medical and scientific data

# If you are interested to join



- Check my website for more information on research topics, activities, and outcomes
- Email me about your interest and potential research proposal
- Take AI related courses, e.g., COMP 657 (AI), COMP 659 (NLP), COMP 692/3 (with a suitable AI/ML topic), and work with me or my collaborators on your Master's Thesis/Project/Essay

# Thanks & Welcome

Any questions? Please Contact Dr. Dunwei Wen at  
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