



Athabasca
University

INTELLIGENT SYSTEMS AND MACHINE LEARNING (ISML)

RESEARCH CLUSTER

Cluster Coordinator

Dr. Oscar Lin

MSc CIS Orientation

November 4, 2025

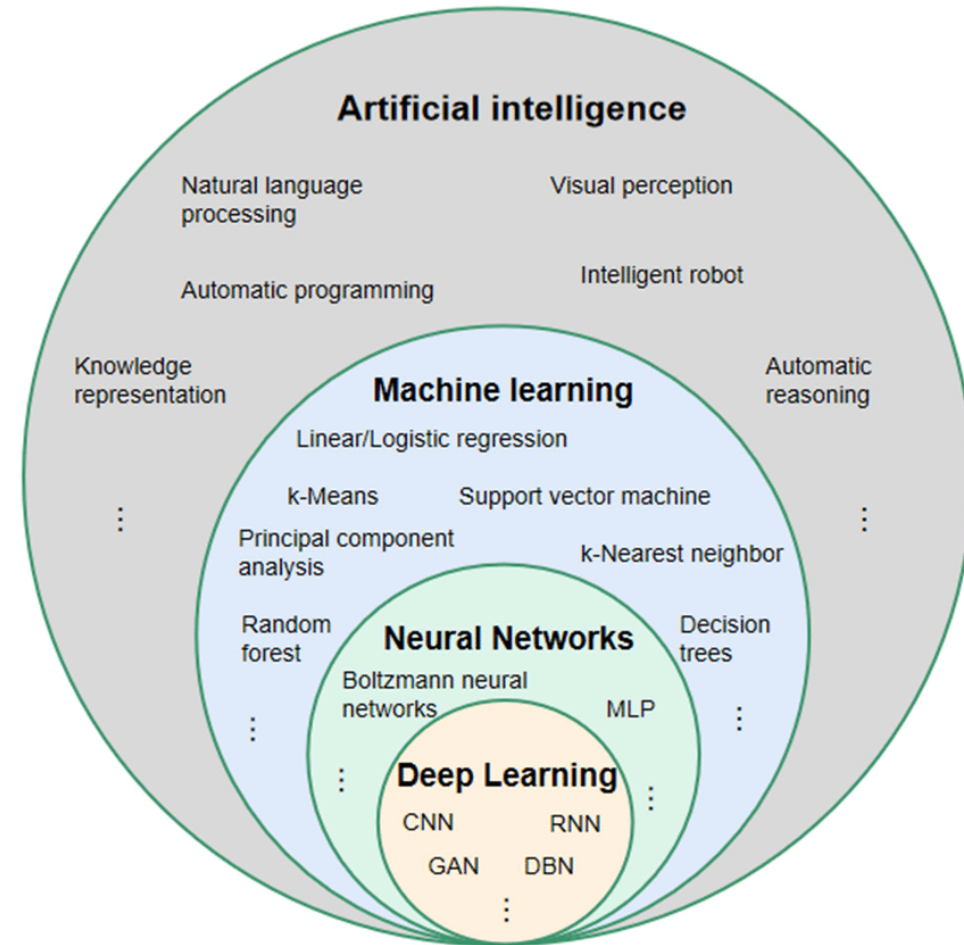
Focused on the future of learning.

Outline

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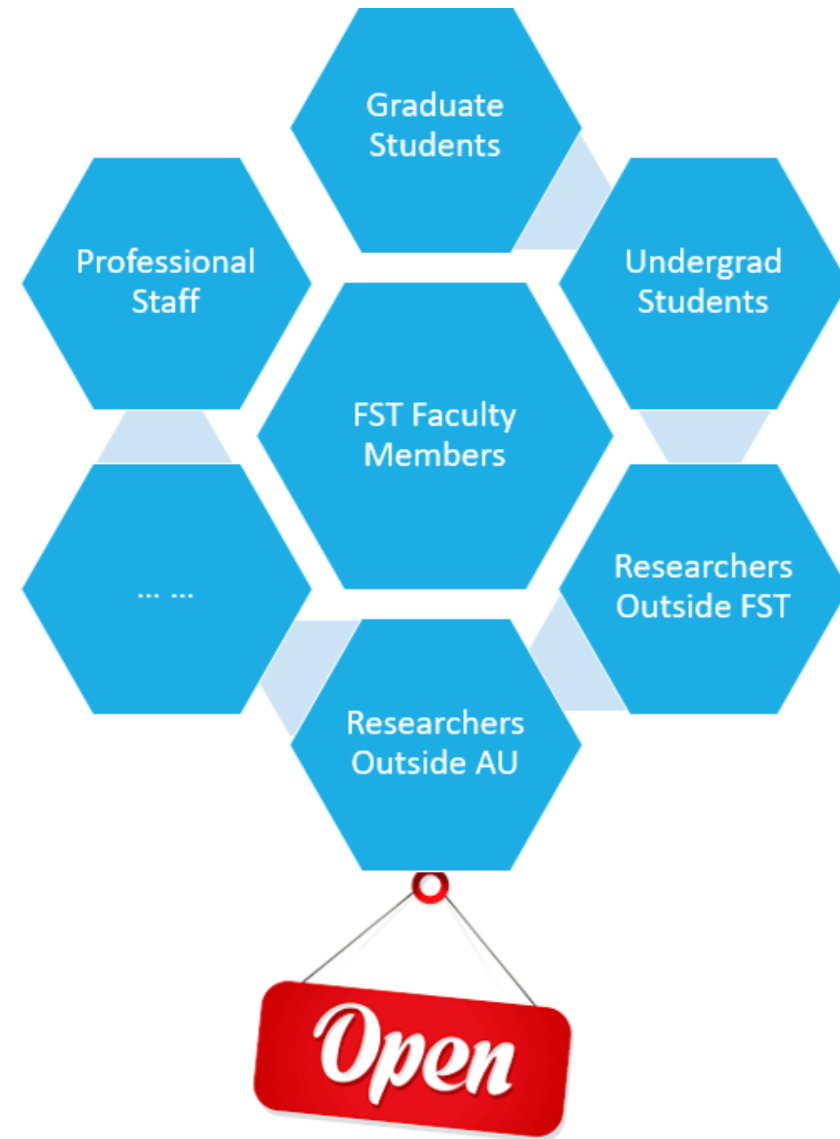
1. Overview

- **Intelligent Systems (IS):**
Systems capable of interpreting complex data, learning, adapting, and making decisions.
- **Machine Learning (ML):**
Subset of AI focused on algorithms and statistical models for computers to learn from data.



2. ISML Cluster

- Sponsored by FST
- Established in Sept. 2021
- Founding member and Coordinator – Dr. Fuhua (Oscar) Lin
- Members
 - 17 Academic member
 - 1 Professional
 - 32 Graduate students
 - 22 Undergraduate students



3. ISML Goals

- Provide a collaborative and supportive **research** environment for faculty and students, e.g.,
 - Partnership with other universities
 - Interaction internally and externally
 - Solving real-world problems
- Create an environment for learner-focused approach of the **teaching** to equip our students with advanced ISML R&D techniques

4. ISML Research Area

Machine Learning

- **Supervised and Unsupervised Learning** (classification, regression, clustering)
- **Reinforcement Learning** (training algorithms based on reward systems)
- **Natural Language Processing** (language understanding, translation, sentiment analysis)
- **Computer Vision** (image recognition, object detection, autonomous vehicles)
- **Data Ethics and Fairness** (addressing bias, privacy, and ethical AI practices)

Intelligent Systems

- **Education** (adaptive learning, personalized learning, educational dashboard design, learning technologies)
- **Multiagent Systems** (distributed AI, distributed problem solving, collaboration among intelligent agents)
- **Healthcare** (predictive analytics, personalized medicine, diagnostics, interoperability)
- **Finance** (fraud detection, stock prediction, risk assessment)
- **Manufacturing** (quality control, predictive maintenance, automation)
- **Agriculture** (crop monitoring, yield prediction, resource optimization)
- **Smart Cities** (Traffic management, public safety, energy efficiency)

5. ISML Activities

- 6 online workshops held
- 10 presentations delivered
 - 4 by MSc IS students
 - 4 by academic and professionals
 - 2 by invited keynote speakers
- Collaborative activities



6. Closely Related Courses

- COMP452 AI for Game Developers
- COMP456 AI
- COMP657 AI Principles & Techniques
- COMP658 Computational Intelligence
- COMP659 Statistical Language Processing for Text Analytics
- COMP667 Multiagent Systems
- COMP682 Data Mining
- COMP683 Learning & Knowledge Analytics
- COMP684 Business Intelligence

7. Funding Supports



8. How to Become a Member?

- Cluster weblink:
<https://oscar.athabascau.ca/isml/index.html>
- Contact:
 - Dr. Fuhua (Oscar) Lin:
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Thank You!