Project Title: Multimodal AI for Modeling Complex Social Systems

Project Description: This project develops and applies modern artificial intelligence (AI) methods to study social connectedness and community well-being using novel large-scale digital data. Students will work with combinations of text, images, geographic information, as well as other structured and unstructured data to build AI systems that learn computational representations of communities and social environments. The project will involve methods such as vision-language models, large language models, multimodal foundation models, representation learning, and graph neural networks. Emphasis will be placed on integrating heterogeneous data, adapting and fine-tuning pretrained AI models, developing scalable learning pipelines, evaluating multimodal systems, and producing interpretable representations of complex social systems.

The ideal candidate is a student with experience in Python and an interest in learning more about artificial intelligence, machine learning, or deep learning. Experience with PyTorch, Hugging Face Transformers, computer vision, graph neural networks, geospatial analysis, or large-scale data processing may be helpful but is not required.

Supervisor: Prof. Ethan Fosse

Application: Please submit your CV, unofficial transcript, and a single paragraph describing your interest in the project in an email to Prof. Ethan Fosse (ethan.fosse@utoronto.ca) and Prof. Nicholas Spence (nicholas.spence@utoronto.ca).

Start Date: Fall 2026 / Winter 2027

Research Areas: Applied Machine Learning, Information Engineering, Human Factors