

# Machine learning applications in process engineering based on directed graphs

## PROJECT DESCRIPTION

Process systems engineering is characterized by systems with a high degree of uncertainty or complexity (or both). This presents significant challenges for the development of process models and their use in real-time monitoring, control and optimization. However, process systems are often instrumented and automated to the extent that some historical data is available. The project proposed here builds on our work in the use of machine learning and cheminformatics to develop network-type models for these systems that can then be analyzed using algorithms developed for directed graphs. For well-understood but complex systems, the directed graph models provide a reduced order model that is easier to analyze and use for control and optimization. For systems with uncertainty, the algorithms provide a feasible approach to developing models in real time from empirical data.

## FACULTY-DEPARTMENT

Engineering - Chemical and Materials Engineering

## OPEN TO STUDENTS FROM THE FOLLOWING INSTITUTIONS

Chinese universities participating in the [\*Double First-Class Initiative\*](#).

## DESIRED FIELD OF STUDENT STUDY

Background in a engineering discipline is required, with preference for chemical engineering, process control and machine learning-related skills.

## INTERNSHIP LOCATION

Edmonton Campus

## NUMBER OF INTERNSHIP POSITIONS

up to 2 positions

## INTERNSHIP DATES

Start: July 2, 2019

End: October 2, 2019

## ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.