Western Engineering

Chemical & Biochemical Engineering

M.Eng Research Project

Project title:	A Comprehensive Survey on Generative AI for Chemical Engineering
Starting date:	Any date
Supervisor(s):	Tianlong (Taylor) Liu
Contact info:	tianlong.liu@uwo.ca
Brief description:	This project aims to conduct an extensive review and analysis of generative AI applications and potentials within the area of chemical engineering. It aims to explore how generative AI, such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and other models, are revolutionizing the design, optimization, and discovery processes in chemical engineering. Students will investigate various applications, from material synthesis and drug discovery to process optimization and environmental remediation.
Objectives:	1) Identify and classify key generative AI models and algorithms being applied in chemical engineering research and industry. 2) Analyze generative AI applications in chemical engineering, focusing on successes, limitations, and the potential for future developments. 3) Evaluate the impact of generative AI on innovation, efficiency, and sustainability within chemical engineering. 4) Predict future trends and opportunities for applying generative AI in addressing unsolved challenges in the field.
Required knowledge:	1) Basic chemical engineering fundamentals. 2) Basic understanding of ML concepts and generative AI principles and capabilities, but no need for deep technical expertise in coding these models. 3) Ability to conduct thorough literature searches, critically analyze academic papers, and synthesize information. 4) Experience in technical writing is an asset.

If interested, please contact the supervisor of the project directly for an interview.