Mechanical & Industrial Engineering
UNIVERSITY OF TORONTO

MIE498H1: Research Thesis 2025-2026

Supervisor	Andreas Mandelis
Supervisor email	mandelis@mie.utoronto.ca
Number of Positions	1
Open to	Mechanical and Industrial Engineering Students
Term Offered	Full-year
Research Area	Mechanics & Design Biomedical instrumentation for cardiology
Research Topic	Photothermal-based Cardiology Catheter Imaging Project-1

Project Description

This project will focus on investigating and optimizing signals for cardiology catheter imaging using laser photothermal techniques. The CADIPT lab is at the forefront of this research, aiming to enhance the accuracy and reliability of imaging methods used in cardiology for quasi-invasive inspection of vulnerable plaques that may cause stroke and heart attack. By leveraging photothermal effects, students can explore innovative ways to improve the detection and diagnosis of cardiovascular disease. This project offers a unique opportunity to gain experience with advanced imaging technologies and contribute to the development of more effective medical tools.

Additional Information	Application: Automated Miniaturized 3D Scanning Stage: Designing an automated miniaturized 3D scanning stage for a photothermal imaging system is a challenging yet rewarding project. This involves creating a compact and precise scanning mechanism that can be integrated into existing imaging systems. The goal is to achieve high-resolution imaging with minimal manual intervention, thereby increasing efficiency and accuracy. Students will apply their hands-on experience in mechanical design, automation, and system integration, making this project ideal for those interested in robotics and imaging technologies.
Application Instructions	Submit unofficial transcript to Professor Andreas Mandelis (mandelis@mie.utoronto.ca)