2025 EECMS Summer Internship Application Form

Main Supervisor	Changbeom Shim
Other supervisors (if applicable)	Tran Thien Dat Nguyen, Hoa Van Nguyen and Ba Tuong Vo
Project Title	A Data Science Approach for Detecting Fugitive Methane Emissions
Student location(s) for the project	B314, Bentley campus, Curtin University, Perth, WA
Duration of project	Eight weeks
Project Description	This project addresses the crucial issue of methane emissions in the resource industry, impacting environmental health and climate change substantially. Methane, a potent greenhouse gas, poses considerable risks when released uncontrolled, particularly from oil, gas, and chemical industries. Growing concerns about safety and environmental protection have made fugitive emissions a significant issue for users and operators. This project leverages advanced data science techniques of innovative sensor (e.g., molecular property spectrometer) deployment to develop a robust detection system for fugitive methane emissions. There are two main goals for this project: **O1.** Effective Sensor Deployment – To design and implement efficient algorithms for sensors to maximise coverage and detection capabilities while minimising costs and considering various constraints; and **O2.** Sensor Data Analytics – To implement a web-based data management and analysis system that continuously investigates relevant data to promptly identify methane leaks. Methods for this project are as follows: **M1.** Sensor Deployment Algorithms – To utilise optimisation and/or search algorithms to determine the optimal placement of sensors by considering factors such as concentration, temperature, location and historical data; **M2.** Interactive Data Visualisation – To develop interactive data visualisation tools for understanding sensor data in-depth and supporting decision-making; and **M3.** University-Industry Collaboration – To work closely with university and industry partners, e.g., woodside, to ensure the practicality and relevance of the detection system. This project seeks an important step towards mitigating the environmental impact of methane emissions in the energy industry through cutting-edge data science techniques enabling strategic sensor deployment. Expected Outcomes include a cost-effective sensor placement system that maximises detection coverage and minimises computational costs. This scalable solution can be adapted to various industrial settings and integrated with existing monitoring systems. By developing a comprehensive system with scalable algorithms, we aim to provide the oil and gas industry with the tools needed to effectively manage fugitive methane emissions, ensuring a safer and more sustainable future.