MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2023-2024

Project Title: **Explainable AI (XAI) for Autonomous Vehicles**

Supervisor(s): Prof. Hai L. Vu

Department: Civil Engineering, Faculty of Engineering

Email: Hai.Vu@monash.edu

Website profile of project supervisor: https://www.monash.edu/engineering/lehaivu

OR https://sites.google.com/site/profhailvu/home

Objective

The project aims to develop new approaches to understand and explain the decisions made by AI-based system such as autonomous vehicles (AVs).

Project Details

Explainable AI (XAI) enhances trustworthiness and transparency in AI-based systems such as autonomous vehicles (AVs) by providing an understanding of the rationales behind the decision-making process and giving clear insights into the AI system's actions thus enhancing user confidence and enabling accurate determination of capability and liability of the systems.

In this project, the selected student will conduct a research on developing XAI methods for the AV planning and decision module which are key component of the AV system. The project leverages different techniques (e.g. Instance Space Analysis and/or metamorphic-based white-box testing approaches) to identify features and construct a new surrogate model to form local interpretable model-agnostic explanations, as well as explain the components of AI models that influence the AV decisions.

We will conduct experiments using CALRA simulator, Autoware/Apollo, and/or similar systems to test and demonstrate the developed methods.

Prerequisites

We are looking for a student who possesses a solid understanding of AI and Deep Learning, as well as proficiency in Python, Ubuntu/Linux, and GitHub. The ideal applicant should have ability to work with a minimal oversight.

Additional Information

Applicants may be required to attend an interview in the selection process. Further reading:
doi.org/10.23919/MIPRO.2018.8400040
doi.org/10.1145/3180155.3180220