MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2023-2024

Project Title: Vehicle-in-the-Loop Simulation for eBikes

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Objective

The aim of this project is to further the development of a tool that enables real eBikes to be embedded into large-scale, simulated, road traffic scenarios. If time permits, the tool will then be used to validate and demonstrate a simple eBike collision avoidance or leader-follower algorithm.

Project Details

Vehicle-in-the-loop simulation refers to when a real vehicle is embedded in an emulation of a road traffic scenario. Vehicle-in-the-loop simulation is useful for observing a real person's/vehicle's behaviours when they interact with a new technology or application, while still providing a relatively safe and controlled environment (supposing the real person/vehicle only interacts with simulated entities). The tool to be developed in this project will comprise of:

- an eBike equipped with a Bosch Active Line Plus drive unit and a Bosch SmartphoneHub
- an Android smartphone (docked in the SmartphoneHub on the eBike) with the Bosch COBI.Bike app. installed, which utilises the Bosch COBI.Bike DevKit
- a module for the COBI.Bike app. (to be developed by the student) that sends/receives information to/from the simulation
- a road traffic simulation (to be developed by the student) built using the SUMO package and potentially a 3D graphics engine such as Unreal Engine

Prerequisites

The successful student should enjoy and have experience at writing code (e.g., Python, Java, Javascript), and have excellent written English skills.

Additional Information

Applicants may be required to attend an interview.