Advanced driver-assistance system (ADAS) for micromobility vehicles

About us
At LEVTEK SWEDEN AB we develop the next generation of micromobility vehicles, combining mechatronics, machine learning and design to achieve more practical and capable solutions. We are located in Malmö where we have our office and facilities for vehicle development and testing.

Background
Advanced driver-assistance systems have great potential for improving safety of the next generation of micromobility vehicles. Modern safety features are complex systems requiring perception and control. Control algorithms such as PID controllers are proven and widely used for regulating speed and acceleration in many of today's micromobility vehicles. Deep learning works well for perception, such as for lane detection. The idea is to combine the strengths of control theory and machine learning in order to achieve robust ADAS capabilities to be used in our micromobility vehicle.

The objective
The experiments will be performed on a LEVTEK prototype vehicle prepared with a vision and deep-learning capable control system. The objective of the thesis is to develop, apply and evaluate ADAS features on the vehicle in order to improve safety for the user.

- Investigate fundamental requirements such as acceleration, braking, response time and actuation dynamics for ADAS for micromobility.
- Develop a kinematic model of the micromobility vehicle.
- Identify one or more potential vision and/or IMU based ADAS features.
- Implement, test and evaluate a selected ADAS feature on the micromobility vehicle.

Qualifications
Modeling and control: Intermediate
Programming: Intermediate (The project involves Swift for iOS and LISP for microprocessors. However previous experience in these specific languages is not a requirement)
Deep learning: Basic understanding of deep learning theory.

Main Tasks
To develop and evaluate ADAS features on a micromobility vehicle in order to improve safety.

Location: Malmö, **Level:** Masters, **Start date:** Fall 2023
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