# MASTER THESIS PROPOSAL

*Autonomous Platform: Machine Learning Module.*




## KEYWORDS:

Autonomous Platform, Python, Openpilot, Autonomous Drive, Machine Learning, C, C++, Linux

## TARGETED PROGRAMS:

Computer Engineering, Information Engineering, Automation & Mechatronics Engineering, Engineering Physics, Engineering Mathematics

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## PURPOSE OF THE STUDY

To increase the knowledge and expertise within the evolving automotive industry, Infotiv Technology Development AB developed the open and educational autonomous platform. The goal of the platform is to have an autonomous gokart that progresses research and development in the automotive industry. Currently, the system is designed in three modules, an Automotive platform that implements the core driving functionality (steering, throttle, and brake) through the CAN. Body electronics include lights, sensors, a horn, and a monitor displaying the platform power mode and a simulated key. Finally, the autonomous drive module runs openpilot for basic driving assistant functionalities using one camera. Please read more about the autonomous platform at https://infotiv-research.github.io/gokart-documentation/.

The purpose of the study is to see the possibility of:

- Introducing new functionalities to the ML autonomous drive module (Traffic Sign, Traffic Light Detection) of the autonomous platform.

- Improving the driver performance by Involving other sensors (LiDAR, Ultrasonic) in the autonomous platform.

- Introducing Driver Monitoring Systems (DMS) to the autonomous platform.

- Verification and validation of the platform using a simulator/digital twin.

## WHO ARE WE LOOKING FOR?

We are looking for 2 master students with a background in data science, electrical or mechatronics engineering, or engineering physics who wish to conduct their thesis during the spring of 2023. Applicants shall have an Interest in both hardware and software development and a desire to deepen their knowledge in embedded systems design. You shall have experience from programming languages such as C++ or Python, and have basic knowledge of communication protocols such as CAN and LIN.

## ABOUT US

TechDev is a department at Infotiv who focuses on SW & HW development and test solutions. We currently consist of 70 technical consultants with diverse backgrounds and experiences from many technological fields. Our employees use their expertise to provide tailored solutions to all kinds of challenges, ranging from SW development, machine learning and simulations, to project & test management and way of working. One of our key strengths is the friendly atmosphere in our technical community, which provides access to TechDevs collective knowledge through internal collaboration tools and competence leader program, continuously providing updates in the latest tech.

## HOW TO APPLY

Apply for this thesis via [https://www.infotiv.se/karriar] no later than [2022-12-31]. Assure to attach your resumé and a short summary of why you want to partake in this thesis.

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