

## TurningPoint – Design and develop a self-driving obstacle avoiding vehicle

2-LINER description: *Design and develop a self-driving & obstacle-avoiding vehicle, fitted with sensors and real-time management from a cloud-hosted backend.*

### [Description of the assignment]

- This internship is focused on processing incoming data from sensors (distance, obstacle-detection, IR distance, etc.) to generate input on which the self-driving 'vehicle' can receive its instructions
- We imagine this vehicle as a platform of max 30cm x 30cm that is fitted with wheels, motors and a ton of sensors.
- Eventually your vehicle will be used (outside the scope of this internship) on top of a smart trashcan (see TrashBeat internship for more details) so we create a smart trash management system
- To realize all this, the vehicle will be loaded with all necessary sensors. It will be driven by a motor. This will all be part of your assignment.
- Your biggest challenge will be the real-time processing of the sensor data to send it over to the driver input management system in a timely fashion.
- The goal of this assignment will be the delivery of an effective working prototype of both the hardware platform as well as the basic obstacle-avoidance model that in combination can deliver a payload throughout our offices to its endpoint.

### [Goals]

- Design an IoT architecture with attention for both hardware, energy as scalability of the software.
- Development of a hardware prototype
- Development of a backend business logic
- Iterative buildup of a basic obstacle-avoidance machine learning model

### [What will you gain]

- You will learn to prototype and adjust minor errors
- You will learn real-time data captation and processing
- You will explore all kinds of possibilities of different sensors
- You will gain knowledge and experience in designing and producing a machine learning solution
- That lovely feeling you'll get knowing your product will in effect contribute to a neater trash management system. It will effectively be used in our offices!

### [What do you need?]

- Creativity and the will to succeed
- A motivated personality that can handle setbacks
- You see the bigger picture when it comes to making software and hardware work together
- You want to learn everything about real-time data and stream processing
- You can't wait to learn a heck of a lot in a relatively limited time period.

### [Location of your assignment]

- Veldkant 33B, 2550 Kontich

### [Your monitor]

- Kevin Smeyers – Technical lead machine learning ToThePoint

### [Technologies you will be using]

- Microcontrollers
- Cloud backend
- Messaging infrastructuur
- Spark en MLLib