**DIT524 Project Date 2017-01-30**

**Group** 02

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**Project Abbreviation and Project Title:**

G.U.A.R.D (Gothenburg Unofficial Assistive Response Device)

**The project main functions (incrementally)**

1. Mobile application
2. Collision detection
3. Camera support
4. Tracking and following a user (dream function)
5. Obstacle avoidance (dream function)

**A short description of each function:**

1. Android application: will provide basic controls (straight, right, left, reverse etc) for the car. Can initially rely solely on bluetooth.
2. Collision detection: the sensors will continuously scan the car’s surroundings and stop the car to prevent collision. The user will be notified in the Android application of the reason why the car stopped (collision detection in this very case).
3. Camera support: the camera on the car allows live streaming to the Android application (requires Raspberry Pie and Wifi connection).
4. Tracking and following an user: the Smart Car tracks and follows the traveler by comparing its position to the position of the phone (GPS/Glonass coordinates). It will send notifications of the journey if problems are encountered, for example the traveler goes out of range, battery life drops to critically low or the GPS/Bluetooth signal becomes too poor to send sufficient signals.
5. Obstacle avoidance: the Smart Car should be able to avoid obstacles in its path while following and tracking the traveller.

**Which system parts will be used?**

Arduino Mega 2560: used for controlling the car

Raspberry Pi: used for livestreaming to the android application

Wifi to Pi: used for livestreaming to the android application

Mobile device: used for running our phone application

Rechargeable battery: to power the Raspberry Pi

GPS module: used to get coordinates for the Smart Car when following user

Ultrasonic sensor: obstacle detection

IR sensor: obstacle detection

Odometer: measure revolutions (thus speed, distance etc)

Camera: used to provide motion picture for the live stream

**Which software and development environment you will use?**

Android studio

Webstorm IDE

Arduino IDE

PyCharm/Eclipse plug-in

**How will you demonstrate the functions?**

All functions, but the dream functions, can be showcased inside for the presentations. If we manage to implement the dream functions (and we are unable to showcase it inside) we will make a short video showing how it works.