

Requirements Document

Product purpose

Our autonomous driving application purpose is to enable both driving comfort and safety by using deep learning system which can make the right decisions on daily driving.

Majority of the accidents happen because of human error. Autonomous vehicles will reduce the chance of fatal crashes by reducing the road traffic and maintaining order on the highway. In a future with self-driving cars, reckless driving, aggressive driving would, and the number of distracted drivers would reduce.

Most of the self-driving applications rely on bandwidth hungry electronics which require costly and complex cabling and installation.

The goal of our product is to turn every car into an autonomous car by replacing the complex systems with an app that will be available to anyone with a smartphone device.

Who will use the product:

Any driver who wants to upgrade the driving experience and make it easier, more comfortable and safer.

Features:

- Self-driving car kit in the form of a mobile application.
- RC-car Control - classifying and analyzing the surroundings using the phone's camera.
- Adaptive Cruise Control (ACC)
- Automated Lane Centering (ALC)
- Forward Collision Warning (FCW)
- Lane Departure Warning (LDW)
- Sign Recognition

Goals for the release criteria:

Functionality:

The application must include detection and correction lane departures ,detect and avoid obstacles and auto-brake if collision possibility is detected.
Additional functionalities are ability to detect road signs.

Usability:

The application will be Intuitive, simple and easy to use.
The application will have no menus or buttons but Settings menu to enable or disable features, calibrations and updates.
When intervention is needed, an alert will pop on the screen and an action will be taken.
There is no need to touch or look at the device at any time but to start the application and close it.

Reliability:

The application is vulnerable to failures caused by the devices and system bugs, to prevent the occurrence of bugs it is necessary to perform strict and comprehensive tests before releasing.
If a failure occurs, the system will inform the user and will recover without its intervention.

Performance:

Since the application will be running in real-time, performance is critical.
The application will be able to load in seconds, its FPS capture will be determined by the video camera used on the system.
Real-time calculations will be as fast as the system is enabling.

Supportability:

The application will be able to run on most of Android OS systems, while not requiring any exclusive camera quality.
Low-end devices will not support all of the application's features because Performance is critical.

Timeline:

The application will be released as late as 25.8.2021 (final submission date)
The application should be almost complete until 28.7.2021 (the early submission date). At this point the system has to be ready without any functionality problems.

Stakeholders review:

Since the target audience of this application are drivers, it is necessary to make sure it meets the needs of every driver.

While developing the application we will request reviews from drivers of all ages and genders.

Both functionality and the UI will be reviewed to make sure we stick to our goals.