Developing an Android App for Test Subject Simulator Environment Communication

Background information: A physical bicycle simulator is under development at the Chair of Traffic Engineering and Control since 2015. Since 2017, the physical bicycle simulator is used for studying the behaviour of bicyclists in simulated environments and evaluating bicycle infrastructure. Lately the bicycle simulator is used for studying the interactions of bicyclists with motorized vehicles for the purpose of gathering dynamic and operational data to develop models for predicting the behaviour of bicyclists for automated driving functions.

For the purposes of the ongoing research at the Chair of Traffic Engineering and Control an existing android application need to be optimized and extended with additional functionalities. In the context of the physical bicycle simulator, the existing android application will serve as a link between the test subject and the simulated automated vehicles and infrastructure for the exchange of information and commands. Possible optimizations include the improvement of the existing communication between the simulator and the android app. Extensions include the design of an intuitive UI, the inclusion of options to communicate specific information from/to the app towards the simulation and triggering of specific behaviour of the simulated road users. The product of the interdisciplinary project will be a prototypic android application capable of handling interactions in a demonstration scenario between an automated vehicle and the test subject.

Requirements:

- Kotlin or Java
- Python
- User interface (UI)/User experience (UX)
- Experience with socket programming and network applications

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