

SUMMARY

This paper was focused on development of a visual guidance platform for calibration of laboratory equipment in Augmented Reality. The need for this platform was based on lack of digitalization of current laboratory calibration methods. The main purpose of this paper is to develop a low-cost and modular visual guidance platform for calibration of laboratory equipment. The workflow can be categorized under 3 sections:

- Analysis of calibration of laboratory equipment
- Development of the AR application
- Usage of the software

Analysis of calibration of laboratory equipment was done to understand the challenges and handicaps of the current in order to provide a better option. After identifying present challenges, requirements for a possible software were analyzed. This analysis was done in two parts. Firstly, requirements of the user have been investigated. In order to ensure that this thesis would be beneficial, it is determined that the user needs to be able to add new data, edit existing data, view saved instructions, enter test results and view test results using the application. Secondly, service requirements have been investigated. Necessary features were to implement user login system, storing data on a database and ability to calculating and exporting results.

After necessary analyses were done, development of the application has started. Unity, Vuforia, Firebase and JetBrains Rider have been selected as technologies to use during the development process. Development process included environment setup, setting up dependencies, designing software architecture and implementation of requirements by coding the necessary scripts.

Finally, the software was ready to test. Tests were conducted at the Laboratory of Mechanical Testing and Metrology at TalTech. As a result, the application was working partly. While adding new device and viewing saved instructions features were working, AR step and saving test results to database features were not working as intended.

In the future, this software is planned to be developed further and bugs will be fixed. As a result, it will be operationalizable in calibration of laboratory equipment. Additionally, user login feature can be improved to not only provide simple security check, but also to add hierarchical user groups in order to add new functionalities. For example, this software can be used to teach the process of using laboratory equipment for educational purposes.