

## Abstract of master thesis

### “System for detecting facial landmarks optimized for real-time execution on a platform for embedded systems”

The facial landmarks describe the main components of the face – eyes, mouth, nose, face contour and serve as a base for many tasks, like facial recognition, lip reading, facial expression detection or gaze tracking. The success of those tasks is strongly dependent on the accuracy of the detected locations of the facial landmarks which they use. Those tasks are widely used for purposes like protection of mobile devices, physical access control for office buildings, driver fatigue monitoring and many more, which require execution in real-time on edge devices. There are many embedded hardware platforms designed for executing artificial intelligence tasks and more specifically machine learning tasks, but their performance is still far behind that of personal computers. This requires additional optimization of the software systems in order to achieve real-time performance on the embedded hardware.

This master thesis makes a summary of the main approaches for facial landmarks detection and reviews previous publications and available data-sets. It proposes a solution for detection of facial landmarks using deep neural networks optimized for real-time execution on the platform for embedded systems Nvidia Jetson TX2. It describes the performed experiments for evaluation of the purposed solution against commonly used metrics on some of the reviewed data-sets and analyzes the results of those experiments.