# Abstract

The Internet of Things is one of the major technological achievements of the decade – the number of connected embedded devices is rising worldwide at an accelerating rate. The Thread networking protocol is a new and promising solution for one of the application uses of the IoT concept, home automation. The work presented in this thesis is a subtask of development of a lighting control system. Hardware components and firmware examples capable of Thread-based operation were made availible by the delevopers of Thread, these were the starting points of development.

In order to implement the lighting control project, and therefore to demonstrate the potential of Thread, the development of a network management software component was needed, which allowed the mutation of the state of the network through a human user interface. In implementation of network management, usage of the Thread Host Control Interface played a major role. Nevertheless, since the processes of the network and user interactions are spread out on several machines, and are independent in timing, the main challange of development lied in synchronizing the independent software processes, and implementing communication between them. In solving these problems I used the FIFO implementation availible in the Linux kernel, as well as mutex and condition variable mechanisms, as defined by POSIX. In addition to creating a network management software, the firmware development of the network nodes was also necessary, the firmware versions were based on the examples projects made availible by the developers of Thread.

The established model network performs the specified functions of the lighting control system, through this, it is capable of demonstrating the power of Thread-based networks. In the thesis I show that during the semester I have accomplished all goals specified in the assignment. The created network management module is reusable to control Thread-based networks deployed in contexts that are independent of the specifics of the lighting control project.