

Abstract

The topic of the BSc thesis work is IoT - based automated systems. The BSc thesis work is about the construction of an intelligent and automated irrigation system, which I designed and implemented applying a NodeMCU V2 development panel. In the introductory part of the BSc thesis work, the state-of-the-art of IoT market is presented. After that the preliminary information needed to understand the IoT and build the automated system is introduced. The text covers the architecture and building blocks of IoT, with a brief introduction to big data, cloud and fog computing. The hardware and software components needed to build the system is also introduced, such as the applied sensors, the actuators, the Arduino IDE, ThingSpeak. One such a sensor in my own implementation is a soil moisture sensor, by which the analog data provided is digitized by the NodeMCU and then used by an algorithm of my own design to decide whether the activation of a water pump is needed or not. If the soil moisture level falls in the dry range, irrigation is started. Since a plant needs time to absorb water from the soil, it is enough to run the process 1-2 times a day. I use power management, in order to operate the system even on battery. At the end further development directions of the completed system is presented.