Sustainable Communication Networks
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IoT Project
Collection and Presentation of Data from a WUSN

Prerequisites:
- Basic knowledge in electronic circuit design
- Basic Arduino programming knowledge
- Android programming
- Qt Programming

Introduction

Wireless Underground Sensor Networks (WUSNs) are usually used in monitoring different kind of conditions i.e. soil properties for agricultural applications, infrastructure monitoring and monitoring of places that are vulnerable to vandalism. In WUSN, all the sensors are burried underground and the communication among different sensor nodes is done wirelessly. WUSN presents new design challenges because of the unique characteristics of the undeground channel. ComNets Bremen is currently working on different challenges faced in WUSN.

Project description

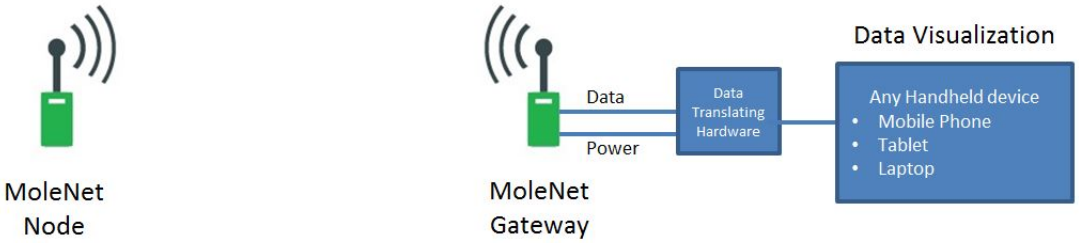
The aim of the project is to wirelessly transmit the data from the underground burried sensor nodes to a hand held device. The hand held device can be a smart phone, tablet or laptop. The MoleNet sensor nodes communicate at 433MHz frequency. An immediate device should be designed that receives the data at 433MHz and tunnels the data to the connected hand held device. The received data should be logged and visualized on the hand held device.

Essential components

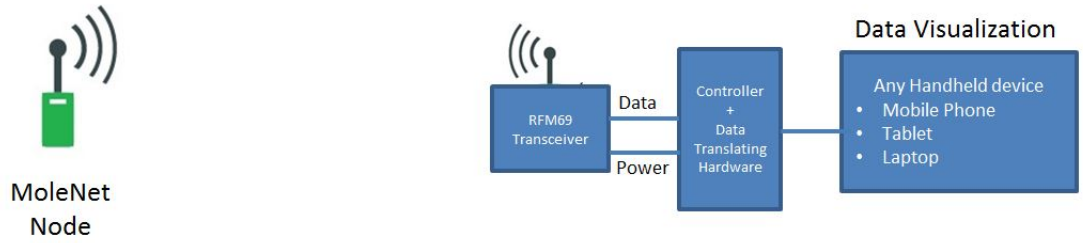
- Wireless interface between the burried sensor node and the device attached to the hand held device.
- The translating device must use the power from the hand held device (no external battery)
- User friendly data visualizer on the hand held device.
- Documentation and presentation of the work

Figure 1 shows the basic layouts for the execution of the project. You can come up with your own unique ideas as well. The final marking will be done on the basis of cost effectiveness, energy efficieny, complexity and usuability of the implemented solution. The group that comes up with the most creative and convenient solution will win the best IoT project award.

April 25, 2017



(a) Approach 1 using existing MoleNet Gateway



(b) Approach 2 with modifying default MoleNet Gateway

Figure 1: Two possible approaches for the IoT project