INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

LoRa SEEL: a Long-Range, Energy-Efficient Communication Network

TECHNOLOGY NUMBER: 2020-130

Technology ID

2020-130

Category

Software

Software & Content

MOSS - Michigan Open Source Support

Inventor

Boyang Zhang

Robert Dick

Yan Zhang

Further information

Ashwathi Iyer

ashwathi@umich.edu

View online page

OVERVIEW

Wireless sensors can monitor large areas of land on a single battery charge for 5-10 years

- Low computational load allows the network to be run on inexpensive processors
- Technology can be used in many field-based applications

BACKGROUND

Many techniques exist to transfer data from the widely distributed sensors that make up the Internet of Things (IoT) (e.g., using 3G/4G networks or cables). Several emerging wireless technologies have recently been proposed to provide long-range communication for IoT sensors, including a wireless mesh networking protocol that allows data to be transferred from nodes to a gateway device for large-area monitoring of IoT applications. However, current solutions focus on wireless communication performance rather than low-power requirements and thus require that gateway devices and nodes be wall powered.

INNOVATION

Researchers at the University of Michigan have developed a novel approach that allow nodes in the field to collect and transfer data to gateway devices without needing to be tethered to a wall outlet. Through an energy-efficient process, these nodes can monitor large areas of land on a single battery charge for 5-10 years. This feature is made possible by a proprietary time synchronization algorithm that allows the nodes to remain in a very low power mode for extended periods of time and then synchronize their intermittent "awake" times in order to

transfer data periodically through an automatically positioned tree-shaped network.

ADDITIONAL INFORMATION

PROJECT LINKS:

- SEEL Github

DEPARTMENT/LAB:

- Robert Dick, Electrical and Computer Engineering

LICENSE:

- Polyform Strict License