

Study on construction of observation network by multi-hop communication of LoRa

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Internet of Things (IoT) where data of many sensors are collected through the network is becoming an important fundamental technology for observation. We are now constructing a network of private LoRa which is one of the low-power wide area (LPWA) communication technologies in order to develop an IoT based system for monitoring water flow of intakes in paddy fields extending 4 km around our college. Because there are some hills around our college and the sensor placed beyond the hill cannot communicate with the gateway (connection point to the Internet) placed in our college by single-hop, we try use broadcast-based multi-hop communication of LoRa based on Matsui (2017)[1] to realize stable communication. To verify of our multi-hop network, we set up three sensors placed behind the hills and six intermediate nodes placed at the locations where stable single-hop communication is possible. From our results, it is confirmed that the data from the sensor arrive at the gateway without any loss via intermediate nodes. By implementing LPWA network combining single-hop and multi-hop communications, stable communication will become possible for all sensors placed in farmland and undulating terrain areas.

[1] Matsui, S., 2017, IEICE Technical Report, 117 (310), 1-6

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