

## ABSTRACT

*Internet of Things (IoT) is a concept that connects all devices to the internet and allows IoT devices to communicate with each other over the internet. Implementation of IoT in remote areas such as mountains is still rare even though the technology that can be used for this case already exists, for example LoRa. Long Range or commonly abbreviated as LoRa is a wireless communication system for the Internet of Things where LoRa offers long-distance communication that exceeds 15 km.*

*In this final project, a climber tracking system will be designed in an IoT-based mountainous area using the LoRa module. The system design starts with the creation of the LoRa end-device in collaboration with the GPS module so that it functions as a sender of location data from climbers. The data that has been sent in the form of coordinates from the LoRa end-device is then captured by the LoRa gateway which is connected to the internet so that it can send data to the The Things Network server. The data that has been receive will then be displayed on the website as a medium for monitoring climbers in the form of the location points of the climbers.*

*There are three test parameters carried out, namely transmission testing including time on air, packet delivery ratio, and receive signal strength indicator, GPS accuracy testing, and QoS testing which includes delay and packet loss. The transmission test got the lowest time on air at SF7 of 0.07s and the highest time on air on SF12 at 1.81s. The lowest percentage of packet delivery ratio obtained is on SF7 of 60% with 500m while the lowest value for the receive signal strength indicator is on SF12 with 150m, which is -72.9 dBm. GPS end-device accuracy value obtained from the test is 4.4m and in the QoS test the best delay value is 0.13 second, the highest throughput is 5.55 KB/s, and the lowest packet loss value is 0.04%.*

**Keywords:** *The Things Network, LoRa, End-device, Tracking, GPS, Spreading Factor.*