

## ABSTRACT

Regular image transmission on Closed Circuit Television (CCTV) systems require good network, especially for transmitting high quality digital images. However, sending high quality digital images through limited bandwidth needs several precautions and treatments, such as the transmission time and which images to be sent. Without these precautions and treatments, it will result in inefficiency of image-based transmission. The main purpose of this thesis is to find the image-based transmission scheme for CCTV systems using Narrowband Internet of Things (NB-IoT) network. This thesis considers individual but consecutive images transmission rather than video transmission to limit the processing time and capacity needed.

This thesis focuses on high quality digital image transmission from CCTV systems to users through NB-IoT network. To find the transmission scheme using NB-IoT network, this thesis conducts performance measurement with a compressed digital image data and transmission algorithm to find optimal bandwidth usage to arrange which data to be sent based on several conditions. The arranged data are sent to the users through NB-IoT.

The output of this thesis is selecting the best compressed images to be sent through the NB-IoT network and transmission algorithm to deliver optimal bandwidth usage, which in future can be a reference to find power consumption on NB-IoT systems.

**Keywords:** *Wireless sensor networks, internet of things, image transmission.*