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## Master Thesis Defense

Entitled

*QUALITY-OF-SERVICE PROVISIONING FOR SMART CITY APPLICATIONS USING SOFTWARE-DEFINED NETWORKING*

by

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Abstract

In the current world, most cities have WiFi access points (AP) in every nook and corner. Hence upraising these cities to the status of a smart city is a more easily achievable task than before. Internet-of-Things (IoT) connections primarily use WiFi standards to form the veins of a smart city. Unfortunately, this vast potential of WiFi technology in the genesis of smart cities is somehow compromised due to its failure in meeting unique quality-of-service (QoS) demands of smart city applications. Out of the following QoS factors; transmission link bandwidth, packet transmission delay, jitter, and packet loss rate, not all applications call for the all of the factors at the same time. Since smart city is a pool of drastically unrelated services, this variable demand can actually be advantageous to optimize the network performance. This thesis work is an attempt to achieve one of those QoS demands, namely packet delivery latency. Three algorithms are developed to alleviate traffic load imbalance at APs so as to reduce packet forwarding delay. Software-defined networking (SDN) is making its way in the network world to be of great use and practicality. The algorithms make use of SDN features to control the connections to APs in order to achieve the delay requirements of smart city services. Real hardware devices are used to imitate a real life scenario of city wide coverage consisting of WiFi devices and APs that are currently available in the market with neither of those having any additional requirements such as support for specific roaming protocol, running a software agent or sending probe packets. Extensive hardware experimentation proves the efficacy of the proposed algorithms.