

# Using Machine Learning to Predict and Monitor Quality of Experience in LTE network

John Prashanth Gnaniah Manohar Lincoln, Master of Science in Computer Science  
University of Dublin, Trinity College, 2019

Supervisor: Meriel Huggard

There is rising popularity for video services over mobile networks. The service providers require an effective method to meet the user's Quality of Experience. There are a number of existing techniques, but they either lack in terms of accuracy or real-time capabilities. An effective model to monitor Quality of Experience should be objective, accurate, light-weight, and non-intrusive. Machine learning algorithms predicting QoE using network QoS can predict in realtime. In this work, an LTE network simulation is designed for video streaming. During the simulation the network conditions are varied and the network QoS parameter along with QoE of impaired videos measured using Full-reference objective model is collected. Six Machine learning algorithms namely Linear regression, Lasso regression, Ridge regression, Random Forrest, Regression tree and Gradient boosting algorithms were trained and evaluated using the collected data. It was observed that Machine learning algorithms were suitable for QoE monitoring as they were able to perform nearly as good as the Full reference objective model, and at the same time they could perform real-time quality assessment.