

Using Machine Learning to Predict Quality of Experience of Video in LTE Networks

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Abstract

With the rapid growth in mobile network usage and video streaming being the most popular service, Quality of Experience of video in mobile networks is of extreme importance to both service providers and their customers. The ability to effectively predict Quality of Experience of video is key for QoE adaptation and higher levels of customer satisfaction.

In this work machine learning algorithms were used to create models that predict QoE with network QoS parameters, including wireless-specific and LTE-specific parameters. An LTE simulation that reflects the current mobile traffic landscape was created to obtain the data set for training. An objective tool for video QoE evaluation was used to gather QoE data necessary to train the prediction models. Support Vector Machines, Random Forest, Gradient Boosted Trees and Neural Networks were chosen as the machine learning algorithms for Quality of Experience prediction, and it was shown that they achieve high accuracy. Influence of wireless-specific parameters on QoE prediction was also investigated, and it was discovered that they are suitable for use in Quality of Experience prediction models.