ABSTRACT

Optical communication is one of the most widely used telecommunication technologies because of its high data transmission speed. In the designing of an optical fiber communication systems, the amount of data that must be processed resulting a longer computation time. Along with the emergence of data science, the application of Machine Learning in optical fiber communication systems to predict the Quality of Transmission (QoT) of a network is widely used. By using Machine Learning, the computation time needed to predict the QoT of a network can be done quickly with high accuracy rate.

This study analyze and predict QoT of an optical fiber communication system using Machine Learning. The QoT paramater used is Q-factor. The data used for machine learning simulations is synthetic data obtained from optical network simulation software. There are three Machine Learning algorithms used in this study, i.e. Linear Regression, Decision Tree and Random Forest.

From the simulations that has been done, it can be evaluate that the use of DT and RF algorithms can be applied to predict Q-factor with an accuracy rate up to 90% for DT and RF algorithms. And the computational time it takes for machine learning to predict Q-factor is only about 0.079 milisecond.

Keywords: *Machine Learning*, *QoT*, *Q-factor*, *Linear Regression*, *Decision Tree*, *Random Forest*.