# Active Wavelength Load as a Feature for QoT Estimation Based on Support Vector Machine

The paper titled "Active Wavelength Load as a Feature for QoT Estimation Based on Support Vector Machine" focuses on utilizing machine learning, specifically Support Vector Machines (SVM), to predict the Quality of Transmission (QoT) in optical networks. Here's a summary of the key points:

**Key Points:**

**Objective:** The study aims to enhance the estimation of QoT in optical transmission systems by incorporating the active wavelength load as a significant feature in the SVM model.

**Background:**
The paper discusses the challenges in managing network resources effectively in optical networks, particularly with the increasing demand for bandwidth driven by services like 5G.
It highlights the importance of accurate QoT prediction to optimize network performance and resource allocation.

**Methodology:**
The authors generated synthetic data labeled with Optical Signal-to-Noise Ratio (OSNR) to train the SVM classifier.
The dataset includes various features, such as the active lightpaths in the network and network topology configurations.
A total of 30,588 training samples were created, ensuring a balanced distribution among different QoT classes to avoid bias.

**Results:**
The SVM model demonstrated a high classification accuracy of 96.2% in predicting the QoT of unestablished lightpaths in generic network scenarios.
The study emphasizes the significance of the active wavelength load in improving the accuracy of QoT predictions.

**Conclusion:**
The findings suggest that incorporating active wavelength load as a feature can significantly enhance the performance of QoT estimation models.
The paper calls for further research to explore additional features and refine the SVM model for better performance in real-world applications.

**Implications:** The research contributes to the development of intelligent optical networks that can dynamically adapt to varying traffic conditions, ultimately improving resource management and network efficiency.

# A Performance Analysis of Supervised Learning Classifiers for QoT Estimation in ROADM-based Networks

The paper titled "A Performance Analysis of Supervised Learning Classifiers for QoT Estimation in ROADM-based Networks" presents a study on the effectiveness of various supervised learning classifiers in predicting the Quality of Transmission (QoT) in optical networks that utilize Reconfigurable Optical Add-Drop Multiplexers (ROADMs).

**Key points from the study include:**

**Objective:** The primary goal is to analyze how well different machine learning classifiers can estimate the Optical Signal-to-Noise Ratio (OSNR) levels of newly established lightpaths in networks with varying configurations and dimensions.

**Data Generation:** The study employs an Optical-MAN simulator to generate a dataset that includes parameters such as wavelength, network topology settings, and segmented spectrum data. This dataset is used to train the classifiers.

**Classifier Evaluation:** The performance of the classifiers is evaluated based on their accuracy in classifying different traffic classes (based on OSNR levels) and the computational time required for training. The study highlights the importance of considering both network topology and the number of active wavelength channels when training the models.

**Results:** The findings suggest that while the classifiers show promise in aiding decision-making processes for network control systems, none achieved an F1-score above 90%. The authors indicate that further tuning and the application of more advanced techniques (like deep learning) could enhance performance.

**Future Work:** The paper concludes with a call for further exploration of the behavioral correlations between classifiers and the potential for improved methodologies in metro-access transport networks.

Overall, the study emphasizes the potential of machine learning in optimizing optical network performance while acknowledging the need for further research to refine these predictive models