Modeling ATS Queue Levels using GNNs

Time Sensitive Networking (TSN) is a set of standards for deterministic service over Ethernet [1]. Asynchronous Traffic Shaping (ATS) is one such standard that does, in contrast to other standards, not rely on time synchronization [2]. An important metric to estimate delay bounds in networks is the occupancy level of queues. The aim of this thesis is to analyze queue occupancy levels using different approaches, including a machine learning approach that relies on Graph Neural Networks (GNNs) [3].


Your Task

- Familiarize yourself with TSN-ATS and GNNs
- Create a datasets using different network simulators
- Apply a GNN approach to predict queue occupancy values
- Evaluate the quality of the approach by comparing queue occupancy values collected using different approaches

Requirements

- Hands-on experience with machine learning, preferably PyTorch
- Basic knowledge of computer networks and communication
- Experience in Python
- Self motivated work approach

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