Autonomous System Models using BGP Data and GNNs

The Internet consists of a collection of independently operated networks, called Autonomous Systems (ASs). The Border Gateway Protocol (BGP) is used to route communication between ASs. Each AS has a number of properties, which might not be publicly available [1,2].

Graph Neural Networks (GNNs) [3] are a machine-learning approach that works directly on graph structured data using a message passing method. Combining GNNs and information obtained from BGP can be used to model AS behavior and derive AS properties. This work will implement and evaluate such an approach.


Motivation

- Familiarize yourself with BGP and GNNs
- Create datasets representing ASs based on BGP data
- Apply a GNN approach to predict AS level properties
- Evaluate the quality of the approach

Your Task

- Hands-on experience with machine learning, preferably PyTorch
- Basic knowledge of BGP and Internet structure
- Experience in Python
- Self motivated work approach

Requirements

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