DDoS Simulation for Autoencoder Testing

Background

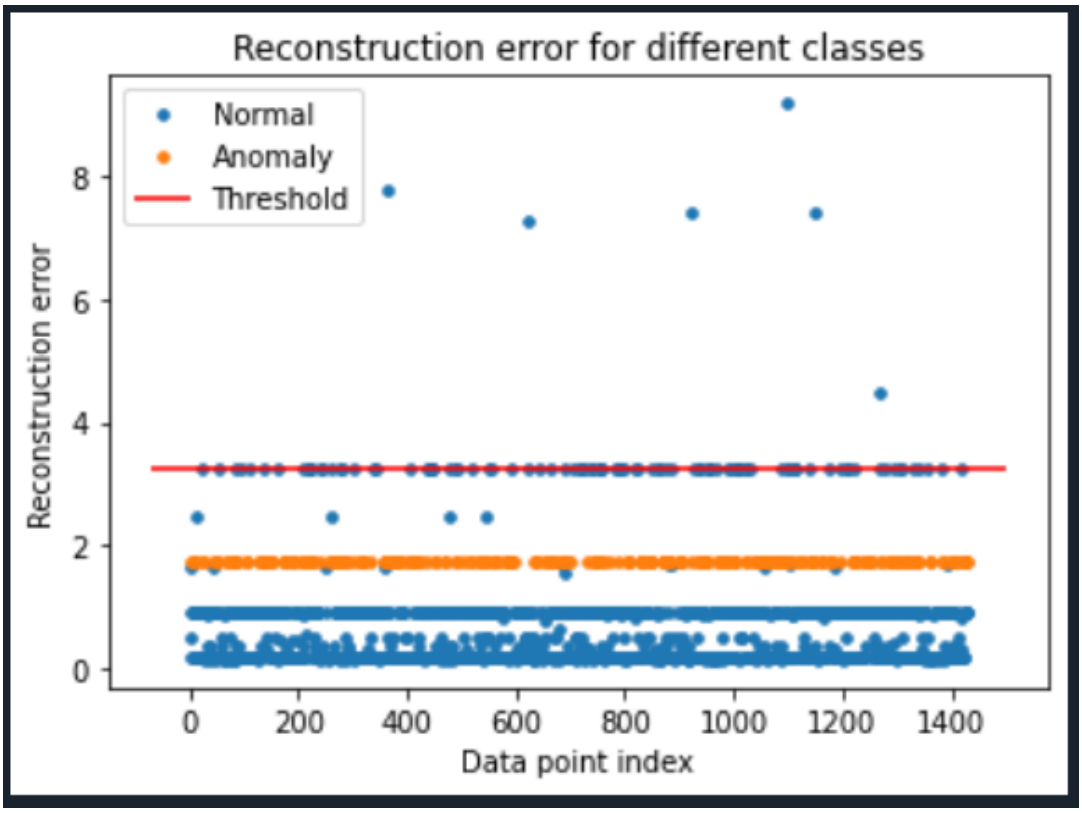
To simulate a malicious traffic flow, network statistics outside the nominal range must be generated. To accomplish this, we created a function which takes as input a packet size and number of packets and returns a feature vector of network statistics. These two parameters can be adjusted to control the data rate, and a data frame with any number of these attacks can be saved for testing purposes.

Anomaly Generation

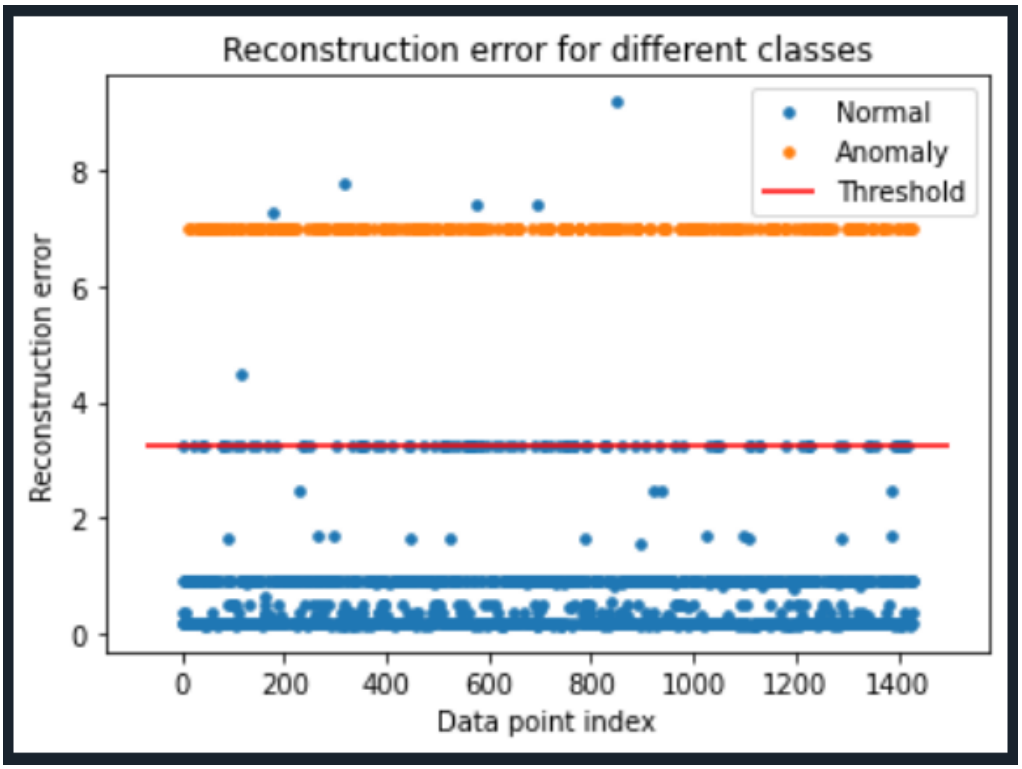
Each anomalous flow has equal-sized packets which makes statistics easy to calculate. An arbitrary duration is chosen to calculate packets/sec and bits/sec. Our tool allows for generation of several flows at once, each with different data rates (if we choose). This allows us to visualize a gradient of attacks as they move across our detection threshold.

Demonstration with PSignite data (at 10 packets/sec)

4 kbit/sec



40 kbit/sec



4 kbit/sec – 40 kbit/sec