DSCI-565: Project Preproposal

Group 3

Jeong Hoon Choi, Yuxuan Liu

Our group is planning a project on Network Traffic Anomaly Detection. The goal is to design and evaluate deep learning models for detecting malicious or abnormal network behaviors.

In the first stage, we will implement models that do not consider the sequential (time-series) nature of network traffic, treating the data as independent records. This will allow us to establish baseline performance using approaches such as fully connected neural networks or CNN-based architectures.

In the second stage (if time allows), we aim to extend the project by developing Transformer-based deep learning models that explicitly process network traffic as time-series data, capturing temporal dependencies between packets or flows. This step is expected to improve detection accuracy by modeling the dynamic patterns of network activity.

For both stages, we will use the CIC-IDS-2017 dataset, which is a widely adopted benchmark dataset for intrusion detection and anomaly detection research.

(https://www.unb.ca/cic/datasets/ids-2017.html)

References:

arXiv:2506.19877

MDPI Electronics 14(1):189

Kaggle Notebook – CIC-IDS-2017 CNNs