



COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

MSc Defence

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Feature based Transfer Learning Intrusion Detection System

Chair: Dr. Denis Nikitenko

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Abstract:

Recent Cyber security breaches, such as the latest T-Mobile data leak in May 2023, which revealed the PINs, Full names and Phone numbers of some customers, and a string of other major breaches by the hacker group LAPSUS, who breached Microsoft and other companies, have demonstrated the need for better security, and better Intrusion Detection Systems (IDSs).

Whereas as previous IDSs have successfully used signature-based attacks for known intrusions, anomaly IDSs have become more important due to their better assessment of Day-0 attacks. In particular, Transfer Learning using Deep learning has not only improved the F1 scores and Detection Rate of IDSs but also reduced the False Negative Ratio.

However, the application of Transfer Learning using deep learning has only been done on the same dataset. This research is focused on transferring the learning between dissimilar data and datasets using feature learning. The datasets chosen are CICIDS2018 and USB-IDS 2021. The proposed approach achieved an F1-score of 97.6% and a Detection Rate of 99.6%.