Intrusion Detection System (IDS) Using Machine Learning

UTD Computer Science Department

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UTDesign

Applying academic innovations to
real–world engineering and
computer science problems

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Company Overview

- The University of Texas at Dallas is home to over 30,000 students.
- The Computer Science department at UTD is one of the largest departments in the country.

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Project Background:

- As the Internet has become an indispensable part of our life the problem of cyber attacks (e.g., intrusion) is increasingly important and must be addressed.
- An **intrusion detection system** (IDS) is an essential component of a defense against cyber attacks.
- This project aims to build a system for IDS researchers to develop and evaluate machine learning algorithms for IDS, using an <u>open-source IDS framework</u>.

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Project Objectives:

- Develop an IDS development environment based on the open-source IDS-ML framework.
- The system will add to the framework
  - A web-based UI (front-end)
  - A database (back-end) to store parameters and results
- Validate the data presented in the LCCDE paper (2022)
- Stretched goal: enhancements to machine learning algorithms used in that paper.

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Skill Sets

Required Skills

Excellent Programming Skills using Python and existing toolkits
Critical Thinking and Creative Problem-Solving Skills
Oral and Written Communication Skills

Skills to be Developed

Cyber security, IDS, machine learning
Web application (for the front-end), database for the back-end
Project management and teamwork (e.g., running meetings)

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Logistics

- Required weekly meetings with the instructor. These meetings are in addition to team's working meetings.
- Meetings will be held in person (location TBD) or via MS Teams.
- Questions?
  - Email nhutnn@utdallas.edu