DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROJECT ABSTRACT FORM DATE: 07-12-2024

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TITLE OF THE PROJECT: Intrusion Detection and Prevention Using Machine Learning and Deep Learning Algorithms in Wireless Sensor Networks of Industry 4.0.

DOMAIN OF THE PROJECT: Cyber Security and Machine Learning.

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ABSTRACT:

An innovative approach to enhancing cybersecurity in wireless sensor networks (WSNs) within Industry 4.0 environments using advanced machine learning and deep learning techniques. While traditional models like Decision Trees, Random Forests, Multi-layer Perceptrons (MLP), and Logistic Regression have been effective, they face limitations in detecting sophisticated cyber threats. To address these challenges, we explore advanced ensemble methods such as Stacking Classifiers, XGBoost, and Adaboost Classifiers. By integrating multiple models, these techniques achieve greater accuracy in identifying and mitigating security threats. Experimental results demonstrate significant improvements in safeguarding sensitive data transmission across WSNs. Beyond Industry 4.0, this methodology offers a robust framework for securing critical infrastructures and ensuring data integrity in diverse applications where cybersecurity is paramount.

Keywords: Cybersecurity, Intrusion Detection, Prevention, Industry 4.0, Wireless Sensor Networks, Machine Learning, Deep Learning, Stacking Classifier, XGBoost, Adaboost Classifier.

Signature of the Project Guide