# Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem - 533437

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**B. Tech 4/4, II-SEMESTER**

**II Semester 2020-21**

**A MACHINE LEARNING BASED LIGHT WEIGHT INTRUSION DETECTION SYSTEM**

**ABSTRACT**

The Internet of Things (IoT) is vulnerable to various attacks, due to the presence of tiny computing devices. To enhance the security of the IoT, this paper builds a lightweight intrusion detection system (IDS) based on two machine learning techniques, namely, feature selection and feature classification. The feature selection was realized by the filter-based method, thanks to its relatively low computing cost. The feature classification algorithm for our system was identified through comparison between logistic regression (LR), naive Bayes (NB), decision tree (DT), random forest (RF), k-nearest neighbor (KNN), support vector machine (SVM) and multilayer perceptron (MLP). Finally, the DT algorithm was selected for our system, owing to its outstanding performance on several datasets. The research results provide a guide on choosing the optimal feature selection method for machine learning.

**Signature of the Guide**

# Course Outcomes (COs)

## Course Outcomes

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| CO1 | Demonstrate the technical knowledge to identify problems in the field of Information Technology and its allied areas. | Understand |
| CO2 | Use literature to identify the objective, scope and the concept of the work. | Apply |
| CO3 | Analyze and formulate technical projects with a comprehensive and systematic approach. | Analyse |
| CO4 | Identify the modern tools to implement technical projects. | Evaluate |
| CO5 | Design engineering solutions for solving complex engineering problems. | Create |
| CO6 | Develop effective communication skills, professional behaviour and team work. | Understand |

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## CO-PO/PSO MATRIX:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 1 | 2 | | 1 | | | 3 | 2 | 2 | 2 | 3 | 2 | |
| **CO2** | 2 | 1 | 2 | 2 | 1 | 1 | | 1 | 3 | 2 | 2 | 2 | 3 | 3 | 1 |
| **CO3** | 1 | 1 | 3 | 3 | 1 | 1 | | | 3 | 2 | 2 | 2 | 3 | 2 | 1 |
| **CO4** | 3 | 1 | 3 | 2 | 3 | 1 | | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| **CO5** | 3 | 2 | 3 | 3 | 3 | 1 | | 1 | 3 | 2 | 3 | 2 | 2 | 1 | 1 |
| **CO6** | 1 | 1 | 1 | 2 | 1 | 1 | | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 2 |
| **Course** | 2.2 | 1.3 | 2.2 | 2.3 | 1.5 | 1.0 | | 1.0 | 2.8 | 2.2 | 2.2 | 2.0 | 2.3 | 2.0 | 1.2 |

| PO1 | Engineering Knowledge | PO7 | Environment & Sustainability |
|---|---|---|---|
| PO2 | Problem Analysis | PO8 | Ethics |
| PO3 | Design / Development of Solutions | PO9 | Individual & Team Work |
| PO4 | Conduct Investigations of complex problems | PO10 | Communication Skills |
| PO5 | Modern Tool usage | PO11 | Project Management & Finance |
| PO6 | Engineer & Society | PO12 | Life-long Learning |

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