**Project Title: Intrusion Detection Using Deep Learning Classifiers**

**📘 Project Overview:**

This project focuses on detecting network intrusions using deep learning models to enhance cybersecurity. By leveraging a hybrid Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) model, the system identifies suspicious activities in network traffic and classifies them as normal or attack instances. The model is trained on labeled datasets and deployed via a user-friendly web application for real-time testing.

**🎯 Objectives:**

* Detect different types of network intrusions with high accuracy.
* Combine the power of CNN (for spatial features) and LSTM (for sequential patterns).
* Provide a simple web interface for users to test the model with input data.

**🗂 Project Structure:**

intrusion-detector/

├── data/ # Dataset files (preprocessed & raw)

├── models/ # Trained CNN-LSTM models

├── notebooks/ # Jupyter notebooks for training and testing

├── app/ # Web interface (Flask/Django)

│ ├── static/ # CSS, JS, images

│ ├── templates/ # HTML templates

│ └── app.py # Backend logic

├── utils/ # Preprocessing and helper functions

├── requirements.txt # Python libraries

├── README.md # Project documentation

**💻 Technologies Used:**

Languages: Python, HTML, CSS, JavaScript

Frameworks/Libraries:

* TensorFlow / Keras
* Pandas, NumPy
* scikit-learn
* Flask (for the web app)

Tools: Jupyter Notebook, VS Code, Git

**📊 Dataset:**

Public intrusion detection datasets like NSL-KDD Cup

Dataset Link  [<https://www.kaggle.com/code/abdallahmohamedamin/sentiment-analysis-using-cnn-lstm-and-cnn-lstm>]

Contains labeled records:

* normal
* DoS, Probe, R2L, U2R (various attack types)

**🔁 Model Pipeline:**

1. Data Cleaning & Normalization

2. Feature Selection

3. Model Building (CNN + LSTM)

4. Evaluation (Accuracy, Precision, Recall, F1-score)

5. Web App Integration

**✅ Results:**

Accuracy: 96% on the test set

Best Model: CNN-LSTM hybrid, outperforming standalone classifiers

**🚀 Future Scope:**

* Deploy as a cloud-based security API.
* Extend detection to real-time streaming data.
* Add support for other network protocols and IoT traffic.

**Team Members**

Angel Rosini Marry G

Atchaya G

Hasini M

Rajaveni R

**Guidance**

Project Guide: Mrs. M.Priyadharshini,M.E.

Head of Department: Dr. K. Krishnakumari, Ph.D.

A.V.C. College of Engineering, Mayiladuthurai

Affiliated to Anna University, Chennai

**License**

This project is intended for academic and research use only.