

SOURIN MANNA

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🌐 [sourin-manna-isi-kolkata](https://sourin-manna-isi-kolkata.github.io)

Education

Indian Statistical Institute

2022 – 2024

M.Tech Cryptology & Security

Hyderabad Central University

2019 – 2021

M.Sc Mathematics

7.8 CGPA

Midnapore College

2016 – 2019

B.Sc Mathematics

70%

Projects

IMDB Sentiment Classification using LSTM.

Jan'24

- Develop a simple single-layer LSTM model for the IMDB movie review sentiment classification. Accuracy 95.8% after 10 epochs.
- Extend the LSTM model with layer-wise & used dropout layer to reduce overfitting. Accuracy 94.8% after 10 epochs.
- Combine the spatial structure learning properties of a Convolutional Neural Network with the sequence learning of an LSTM. Accuracy 98.3% after 10 epochs.

Loan Default Prediction Using Random Forest Classifier.

Oct'23

- Developed a model using Random Forest to predict loan default risk and assess creditworthiness for loan applicants.
- Activities: Data Preprocessing, RandomForest Classification model, EDA
- Validation models: 5-fold cross-validation, train and test split. Average 5-fold cross-validation score 88.5%.
- Find accuracy score: 94.8% for train and 88.5% for test. Tools: Python, Machine Learning, Random Forest.

Stock Market Prediction And Forecasting Using Stacked LSTM.

Mar'24

- Develop a three-layer LSTM model and one-layer Dense for the Axis Bank stock price prediction, Utilized data analysis and machine learning to predict the next 30 days' stock price.
- Import Axis bank data from Yahoo Finance. Achieving a significant reduction in mean squared error loss.
- Accuracy: Performance root mean square error, for train 140.99 and test 640.37.
- Validation models: Train and test split, K-fold cross-validation use for reduce overfitting the model.

Student Database Create and Management. (SQL Project)

Apr'24

- We created a student database from scratch, including table creation and data insertion. We joined two tables using common attributes and performed update and delete tasks, as well as applied aggregation functions.

Work Experience or Internship

Defence Research and Development Organisation(DRDO) - SAG

Jan'24 – Present

Machine Learning/Deep Learning for Crypto Intern

Delhi

Guide: Scientist S.P. Mishra, 'G'.

- Explored vulnerabilities of the 10-round(128-bit keys) Advanced Encryption Standard (AES) cryptosystem through side-channel attacks using power consumption data.
- Applied various Machine Learning/Deep Learning models to predict the hamming weight of first 8-bit cipher text after XOR with key and s-box performed. Our next step is to predict a 128-bit key using a multiclass classification approach.
- Achieved a 63.9% accuracy rate using XgBoost in predicting the hamming weight of the first 8-bit data, outperforming Logistic Regression (44.2%), Random Forest (47.9%), and ANN (43.95%).

L-earnapp

Jun'23 – Aug'23

Data Science Intern

Delhi

- Generate current affairs questions: Scan newspaper, generating question and answer, generating 3 wrong answers related to the question.
- Design questions and answers generator platform.

Skills & Interests

Languages: Python, C, SQL(CREATE,INSERT,DELETE,Aggregate,JOIN and filter Data), HTML

Technical: Machine Learning, Deep Learning(ANN, CNN, RNN), NLP, Data Science, Ms Excel, Ms Word, VS Code.

Data Science: EDA, Statistical Modeling, Data Preprocessing, Feature Engineering, Data Cleaning.

Tools & Libraries: Numpy, Pandas, Scikit-Learn, Tensorflow, Keras.

Interests: Data Science, Machine Learning, Data Analysis, Business Analytics, Mathematics and Statistics.

Network and security projects

Location Aided Routing in Mobile ad hoc Network - ISI Kolkata, Dr. Anisur Rahaman. **Feb'23-May'23**

Mitnick Attack - ISI Kolkata, Dr. Avik Chakraborty. **Nov'23**

Designed own webpage - ISI Kolkata. **Api'23**

- Designed own webpage on isical.ac.in using HTML – <https://www.isical.ac.in/crs2218/>

Relevant Coursework

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|----------------------------|---------------------------|------------------------|--------------------------|
| • Machine Learning | • Cryptology | • Computer Network | • Information & Cod. Thm |
| • Probability & Statistics | • Deep Learning | • Advanced Mathematics | • DBMS |
| • SQL | • Python for Data Science | • Operation Research | • Blockchain |

Workshop and Certification

Machine learning for Cryptology(ML4Crypto) - ISI Kolkata and DRDO. **8th Nov'23-10th Nov'23**

- Goal: A workshop on using AI/ML try to attack cryptographic algorithms and find the secure key of these algorithms. This means using AI/ML to find vulnerabilities in secure cryptosystems.
- Organized by: Centre for AI and Machine Learning (CAIML), ISI Kolkata, SAG, DRDO.

Machine Learning Specialization- Andrew Ng, Coursera. **Jun'23-July'23**

Exam Qualification

GATE in Computer Science - 2023

ISI Entrance(CrS) - 2022

GATE in Mathematics - 2021 & 2022