Ajay Choudhury

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Education

Indian Institute of Science Education and Research, Bhopal 2018 – 2023
BS-MS Dual Degree in Electrical Engineering and Computer Science, Minor in Data Science

Kendriya Vidyalaya No.1 Kanchrapara, West Bengal 2018
AISSCE with Physics, Chemistry, Maths and Computer Science

Experience

Web Development Intern | Live June 2022 – September 2022
EECS Department, Indian Institute of Science Education and Research, Bhopal *Madhya Pradesh, India*

- Developed the department site from scratch using **ReactJS**, **ExpressJS**, **NodeJS** and **MySQL** database.
- Used **Google Sheet API** to fetch volatile data and added source control using **Git** and **GitHub**.
- Deployed the project using **Apache** in **CentOS server** with **SSL**.

Teaching Assistant April 2022 – July 2022
Indian Institute of Science Education and Research, Bhopal *Madhya Pradesh, India*

- Taught fundamentals of **C programming**, **Linux commands** and **Data Structures** to undergraduates.
- Assisted a class of 250+ students with coding problems in practical sessions under Dr Shashank Singh.

Technical Skills

Languages: C/C++, Python, JavaScript, SQL, Java, R, HTML, CSS.
Frameworks: React, Node.js, Express.js, Gatsby.js, Next.js, Django, WordPress, Ghost, Tailwind CSS, Bootstrap.
Core Subjects: Data Structures and Algorithms, Operating systems, Computer Networks, DBMS and OOPS.
Developer Tools: Unix/Linux, Git, GitHub, Bash, VS Code, Visual Studio, IntelliJ, Postman.

Projects

Study and Cryptanalysis of BLAKE Hash Function | Repository February 2022 – April 2023

- Analyzed **preimage attacks** on BLAKE2s and BLAKE-256 hash functions and proposed an improvement in time complexity of a 2-round attack from $\mathbf{2^{224}}$ **to** $\mathbf{2^{192}}$.
- Implemented a preimage attack on 1.5-round of BLAKE and BLAKE2s hash functions in C.
- Implemented a differential(known plaintext) attack for **key recovery** from **6-round DES block cipher**.

Land-type classification using Hyperspectral Image August 2022 – October 2022

- Hyperspectral data with 220 bands from the AVIRIS dataset was used to classify land into five different categories using an unsupervised machine learning algorithm.
- Due to coarser spatial resolution, the number of dimensions was reduced using **principal component analysis (PCA)** and **KMeans** clustering algorithm was used for classification.

Model for Credit Card Fraud Detection | Repository February 2022 – April 2022

- Developed a novel machine learning model for credit card fraud detection using **decision tree classifier** with an **AUC-ROC score of 91.83%** and **f-measure of 0.891** after hyper-parameter tuning.
- Overcame the issue of overfitting due to continuous data in decision tree using **cost complexity pruning** and **grid search** techniques.

Django Web Application | Repository July 2021 – August 2021

- Built a full stack web application having a blog app supporting **CRUD** operations, native commenting system, an **user authentication system** and **Google OAuth** using **Django**, **Python**, **JavaScript** and **PostgreSQL**.
- Redesigned the default Django Admin dashboard using **Tailwind CSS** and deployed the project in **Ubuntu server** using **Gunicorn**, **Nginx**, Git, GitHub and **cloud storage**(DigitalOcean Spaces) for media.

Extracurricular Activities

Web Developer for Chrysalis (Science Council, IISER Bhopal) | Live October 2021 – April 2022

- Built a full-stack web application for the Chrysalis science magazine with blogging, native commenting system, native user authentication, **podcast** embedding feature from **Spotify** and content searching.
- Tech stack used: **Django**, **PostgreSQL**, **JavaScript**, **Bootstrap5** and deployed on **Heroku** using **Cloudinary** for media files.