Arnab Dash

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Objective

Driven and analytical Python Developer, currently pursuing an M.Sc. in Computer Science (Data Science), with strong programming foundations and hands-on experience in machine learning, web development (`Django`), and system automation. Passionate about leveraging technology to solve complex real-world problems. Seeking a challenging role within a forward-thinking organization to apply and further develop technical expertise.

Education

Central University of Rajasthan *2022 – 2024*
M.Sc. in Computer Science (Data Science)

Vidyasagar University *2017 – 2020*
B.Sc. in Computer Science and Mathematics

Internship Experience

Data Science and Machine Learning Intern *Feb 2024 – Aug 2024 (6 Months)*
YBI Foundation — Remote

- Developed and implemented data science solutions for real-world scenarios, utilizing Python libraries like `Pandas`, `NumPy`, and `Scikit-learn`.
- Applied various machine learning algorithms (e.g., classification, regression) to analyze datasets and address practical business challenges.
- Gained practical exposure to industry data science workflows, including data preprocessing, model training, and evaluation.
- Collaborated effectively with peers and mentors using version control (`Git`) and communication platforms, enhancing both technical and soft skills.

Technical Skills

Programming Languages: `Python`, `C++`, `SQL`
Frameworks/Libraries: `Django`, `Pandas`, `NumPy`, `Matplotlib`, `Scikit-learn`, `TensorFlow`, `Keras`
Databases: `MySQL`, `SQLite`
Tools: `Git`, `GitHub`, `Docker`, `Jupyter`, `VS Code`, `Linux`, `JSON`
Concepts/Other: REST APIs, Threading, Socket Programming, SMTP, File System Operations, GPG Encryption
Languages: English (Fluent), Bengali (Native), Hindi (Spoken)

Projects

Machine Learning / Data Science

OFS-NN: Phishing Website Detection Model

- Developed an effective phishing website detection model achieving **98.3% accuracy** by implementing a novel **Feature Validity Value (FVV)** index and optimal feature selection algorithm.
- Designed and optimized a 7-layer `Neural Network` architecture after extensive experimentation, successfully reducing training burden while maintaining high detection precision.
- Processed and analyzed over 13,000 `URL` samples from multiple sources (`UCI`, `PhishTank`, `Alexa`), evaluating model performance through comprehensive metrics that demonstrated superior results compared to existing approaches.

Sentiment Analysis using NLP

- Built an NLP pipeline using `NLTK` and `Scikit-learn` to classify text sentiment (positive, negative, neutral).
- Applied text preprocessing techniques including tokenization, stemming, and lemmatization to improve classification performance.

Cybersecurity / Secure Communication

ChatGPG – Secure Communication Application

- Engineered a cross-platform desktop application in `Python` for end-to-end encrypted messaging, file sharing, and email using GPG.
- Implemented a decentralized peer-to-peer communication system using `socket` programming, eliminating reliance on central servers.
- Designed and built an intuitive GUI using `Tkinter`, featuring real-time status updates, a tabbed interface, and integrated key management tools.
- Integrated secure email functionality via `SMTP`, supporting Gmail 2FA and multiple GPG encryption standards (`RSA`, `ECC`, `DSA`).

Automation / Tools

F-Droid Downloader – APK Repository Automation Tool

- Created a command-line tool in `Python` to automate the batch downloading of APKs from the F-Droid repository index.
- Implemented efficient `JSON` parsing for processing the app index and utilized `JAR` extraction techniques for metadata retrieval.
- Integrated the Rust-based tool `apkeep` via `subprocess` calls for robust and performant package downloading and management.
- Incorporated download tracking and state management to handle interruptions and incremental updates.

IoT / Embedded Systems

Home Automation System using Raspberry Pi

- Developed a smart home prototype using a `Raspberry Pi` and `Python`, interfacing with appliances via GPIO pins.
- Created a user interface (specify type if possible, e.g., CLI, basic web interface) enabling control over connected devices like lights and sensors.
- Implemented logic for basic automation rules based on sensor input or schedules.