Nazia Shehnaz Joynab

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Education

- **Military Institute of Science and Technology** — Dhaka, Bangladesh
  Bachelor of Science in Computer Science and Engineering; CGPA: 3.65/4.00 — *Feb. 2019 – Feb. 2023*
  - MIST Dean's List of honor - 2019 Academic Session (2018 - 2019)
  - MIST Dean's List of honor - 2020 Academic Session (2019 - 2020)

Experience

- **Samsung R&D Institute Bangladesh** — Dhaka, Bangladesh
  Software Engineer I, Full-time, Onsite — *Dec 2023 - Present*
  - Contributed to AI PoC (proof of concept) developement.
  - Involved in internal ideation contest and patent idea innovation.

  Full Stack Development Intern, Full-time, Onsite — *Jun 2023 - Dec 2023*
  - Database design, query optimization, middleware design, manual testing and bug fixing of 3 internal applications using Laravel, CodeIgnitor, PHP and MySQL. Collaboration with team members using Github Enterprise.

Publications

Journals

Joynab, N. S., Islam, M. N., Aliya, R. R., Hasan, A. R., Khan, N. I., & Sarker, I. H. (2024). A federated learning aided system for classifying cervical cancer using pap-smear images. *Informatics in Medicine Unlocked*. (link, pdf, data and materials)

Projects

- **AlertTrace**
  A Wearable SOS Alert System with Safest Route Suggestion and Crime Prediction using Machine Learning.
  - **ML Model Development**: Data analysis was done using K-Means Clustering. Data Encoding and Normalization were done. Feature Importance was determined using Random Forest Algorithm. Compared 6 different ML models to predict crime type where LightGBM performed best. Hosted the ML model to cloud using Flask and Heroku.
  - **Hardware Development**: Arduino Nano, GSM module, and GPS module was used to make a wearable device. If the user pressed the SOS button from the wearable device, latitude-longitude with the device id was stored in Realtime Database.
  - **Android Application Development**: OTP based authentication system, emergency contacts set up, SOS alert generation, realtime tracking of victims on Google Maps were implemented using Flutter. Cloud Firestore was used to store user data. Safest route suggestion was given using Dijkstra algorithm taking crime index as the weight of a path between two location nodes.

- **Joyita**
  A ML-Based Android Application for Screening, Facilitating the Cervical Cancer Treatment.
  - Created re-usable widgets, maintained a structured codebase while developing the whole project in **Flutter**. Used **Cloud Firestore** in the backend to store doctor appointment details, patients' blogs. Hosted ML model using **Flask and Heroku**. Testing of the application was done by almost **50+** users.

- **Shopner Pathshala**
  E-Learning Platform for Special Children
  - Created ER and Schema Diagram, used **PL/SQL** (procedure, trigger, sequence, cursor, exception handling) and constraints. CRUD operations were added for automated appointment system, online forum, new course addition, result displaying options and role based authentication. Used **Laravel8** and **Oracle 11g** as backend. Dynamic graph generation of a student's result data using **Chart.js**.
- **Bengali Sign Language Recognition Using Deep Learning**
  - Compared five pre-trained models for recognizing 38 classes using pre-trained models of Pytorch - **Densenet121, VGG16, Mobilenet v3 small, Mobilenet v2, and Resnet50**; achieved an overall test accuracy of 96.57%, 95.13%, 92.82%, 95.52%, 96.31% respectively for each model.
- **StopStalk Clone**
  A dynamic problem-solving profile creator for portfolio building.
  - Used **BeautifulSoup and Flask** to dynamically scrape solve counts from the online judges, used **Nextjs** in the frontend to fetch data from hosted Flask api.
- **Federated Learning Aided Cervical Cancer Classification**
  - CNN models were developed using hyper-parameter tuning to fit into a federated learning architecture where the final test accuracy was obtained above 85%. A comparison was also done with traditional ML models where FL-based CNN models performed better.

Programming Skills

Languages: Python, C++, Java, SQL, JavaScript
Frontend: Nextjs, HTML5, CSS3, Bootstrap, Streamlit.
Backend: Laravel, CodeIgnitor, Flask, Django, Apache.
Database: MySQL, Oracle, Firebase
Android: Dart, Flutter.
Machine Learning: PyTorch, TensorFlow, sklearn
Graphics/UI Design: Blender, Adobe Illustrator, Figma
Others: Linux, Docker, Github, Heroku, Render, Vercel.

Achievements

- 2nd Runners-up (MIST_Constants) Devmania 2022, BDOSN
- top 100/1000 teams at Mujib 100 Idea Contest(2021)
- 34th position (Bitchamps), Inter University Girls' Programming Contest Season 2, NSU
- Placed 15th position in the preliminary contest of Code Samurai hackathon 2022 and participated in the main event.

Certifications

Hackerrank: Problem Solving (Basic), SQL, Python(Basic)
Kaggle: Intro to Machine Learning, Intermediate Machine Learning, Data Cleaning, Intro to Deep Learning.
MIST Innovation Club: Android and IOS development in Flutter
She Thinks Code: Introduction to Natural Language Processing by building a simple app.

Extra-Curricular Activities

- **MIST Computer Club**
  Executive Director (2022) and Team Leader of R & D (2021)
- **MIST Innovation Club**
  Supervisor and Team Leader of Application Dev (2022)
  - Conducted a workshop on the basics of Python **Object Oriented Programming**.
  - Prepared video tutorials of **Django**

Problem Solving Profile

Solved 600 problems across all platforms.
Leetcode (nazia32), **Hackerrank (geek_a_byte32)**, **Vjudge (dheeranazia)**, **CSES (geek_a_byte32)**