S M SAKIF SHAHRIYAR

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https://smsakifshahriyar.github.io/

Education

Bachelor of Science in Civil Engineering (Major: Transportation Engineering)   07/2024
Bangladesh University of Engineering & Technology (BUET), Dhaka
CGPA: 3.74

Skills

Programming: Python (NumPy, pandas, OpenCV, Matplotlib, scikit-learn, statsmodels), MATLAB

ML & Vision: Linear & logistic regression, tree-based methods & ensembles, SVMs, feature engineering, neural networks, object detection & multi-object tracking for traffic/pedestrians (YOLOv8, BoT-SORT, BYTETrack).

Certifications

Statistical Learning with Python – *Stanford Online*
Verified certification covering linear regression, classification, tree-based methods, SVMs, deep learning, and unsupervised learning. (View)

Projects

Pedestrian Crossing Intent Prediction from Dashcam Video
Built a YOLOv8 + BYTETrack based dashcam pipeline to track pedestrians and estimate crossing intent from ego-motion–corrected trajectories and lane/curb geometry, outputting SAFE / APPROACHING / CROSSING states overlaid on video. (GitHub) (Watch Demo)

Surrogate Safety Analysis at Urban Intersection Using YOLOv8 + BoT-SORT Tracking
Developed a YOLOv8 + BoT-SORT pipeline in Python to detect and track road users and compute surrogate safety metrics (TTC, PET) for near-miss classification across intersection zones. (GitHub) (Watch Demo)

YOLOv8-L Based Traffic Detection for Dhaka Streets
Trained a custom YOLOv8-L model for Dhaka traffic detection (8 classes), achieving strong performance on frequent classes (car, bus, auto-rickshaw) and diagnosing weaknesses on rare ones (van, truck); implemented in Python with YOLOv8-L and OpenCV. (GitHub) (Watch Demo)

MNIST Neural Network from Scratch
Built a neural network from scratch using only NumPy (no ML frameworks) to recognize handwritten digits, implementing forward propagation, backpropagation, and gradient descent. (GitHub)

Seat Plan Generator — exam seating automation (Python): Developed an end-to-end automated seating system for Uttara University, now officially used for every exam to manage seating for thousands of students per session; automates parsing, seat assignment with adjacency/restriction logic, and PDF generation using pandas, pdfplumber, and FPDF. (GitHub)

Projects (continued)

Seat Plan Web App — browser tool for seating outputs (Flask)
Extended the seat plan generator into a Flask web app with login/upload flow, enabling departmental staff to generate seat plans and related documents with one-click ZIP downloads, using Flask with HTML and CSS. (Link)

Mars Site Selector — topography screening tools (Python)
Developed tools to evaluate Mars Orbiter Laser Altimeter (MOLA) digital elevation models for potential landing sites: scanning and scoring low-relief zones, visualizing candidates on color maps, and generating elevation profiles using NumPy, OpenCV, Matplotlib, and Tkinter. (GitHub)

Bayesian Search & Rescue — probabilistic search simulator (Python)
Created an interactive Bayesian search simulator that models sequential area searches on a map, applying probabilistic updates based on forecast and realized effectiveness and running Monte Carlo simulations (up to 10,000 iterations) to compare search strategies, using Python with NumPy and OpenCV. (GitHub)

Housing Price Modeling — regression practice project (Python)
Built and evaluated linear regression models for housing prices on a large sales dataset, with feature engineering (location, interactions, time effects) and model validation (cross-validation, RMSE, R^2) in Python (scikit-learn, statsmodels). (GitHub)

Earthwork Cut–Fill Calculator — highway earthworks (MATLAB)
Designed a command-line tool to compute earthwork volumes using average-height, trapezoidal, and prismoidal methods, with support for multi-segment grades, unit selection, and basic data visualization, developed in MATLAB. (GitHub)

Work History

Lecturer, Department of Civil Engineering   01/2024 - Current
Uttara University, Dhaka
Deliver lectures and practical sessions in civil engineering and handle departmental duties

Publications

A Review of the Freight Generation Models and Data Collection Techniques – Noushin Syeara Rodoshi; **S M Sakif Shahriyar**; Md. Amin Al Noor; Md. Shamsul Hoque. *Proceedings of the 7th International Conference on Civil Engineering for Sustainable Development (ICCESD 2024),* KUET, Khulna, Bangladesh, 7–9 February 2024.

Undergraduate Thesis

Modelling Dhaka's Urban Freight Logistics Considering Shipment Size and Vehicle
Developed predictive models to analyze factors influencing freight vehicle choice and shipment size among establishments in Dhaka City. Conducted data collection, performed data analysis using RStudio and Python, and built machine learning models under the supervision of Prof. Md. Shamsul Hoque.

Awards

Recognition for Excellence in Developing Transformative Solution for Exam Seat Planning – Department of Civil Engineering, Uttara University
Presented by the Chairman, Department of Civil Engineering, Uttara University, in recognition of my development of an automated system to streamline exam logistics.

References

Prof. Md. Shamsul Hoque.
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