ANINDYA KUNDU

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PERSONAL DETAILS

Gender	Male
Date of Birth	22/04/1998
Nationality	Indian
Languages	English (C2), Bengali (C2), Hindi (C1)
LinkedIn Profile	*linkedin.com/in/meganindya/*
Passport issued at	Kolkata
Expiry Date	30/09/2029
Residential Address	4/45 Azadgarh, Kolkata 700040, West Bengal, India

EDUCATION

Indian Institute of Engineering Science and Technology, Shibpur *July 2017 – Present*
Bachelor of Technology (BTech) Overall CGPA: *9.15/10*
Department of Information Technology Position in class: *1*

Semester	1	2	3	4	5
SPI	8.33	9.38	9.33	9.00	9.71
CPI	8.33	8.85	9.01	9.01	9.15

The Future Foundation School, Kolkata *2014 – 2016*
Senior Secondary (ISC) Overall Percentage: 95
Physics, Chemistry, Mathematics, Computer Science, English, Bengali

St. Xavier's School, Raiganj *2002 – 2014*
Secondary (ICSE) Overall Percentage: 96
Science, Mathematics, History and Civics, Geography,
Computer Applications, English, Bengali

VISION STATEMENT

To contribute to the development of interactive technologies with a shallow learning curve, which automate tedious manual processes, and those that facilitate the process of education.

My higher vision for such is to increase the net productive time of an individual so that people can invest more of their personal resources in actual fruitful activities.

INDEPENDENT COURSEWORK

Machine Learning (Coursera) Stanford University

Deep Learning Specialilzation (*5 courses*) (Coursera) deeplearning.ai

EXTENDED COURSEWORK

Developed programs in *MATLAB* implementing different encryption/decryption schemes on grayscale images, based on some research papers in **Secret Sharing**.

- Replicated in code, *Adi Shamir*'s (r, n) thresholding Secret Sharing Scheme. This scheme uses Lagrange's Interpolation and inverse-modulo operation to achieve results.
- Followed *Chih-Ching Thien* and *Ja-Chen Lin*'s approach which is similar to the previous, to develop another (r, n) scheme. I've also implemented the improved scheme that eliminates one drawback of the initial method, which is also discussed in their paper.
- Replicated in code, *Li Bai*'s matrix-based Secret Sharing Scheme.
- Replicated in code, *George Blakley*'s hyperplane based Secret Sharing Scheme.
- Developed the encryption and adding methods for (2, n) *Visual Cryptographic Scheme* based on *Naor – Shamir* constructions.

Developed the prototype of a **Fingerprint-based Biometric Voting Machine** using two *Arduinos* communicating through an I^2C communication channel, as part of my BTech 5th semester mini project. I am currently working on further improvements of the prototype in terms of security, reliability, and practicality. For the same, I have considered the use of a single-board microprocessor system, over a microcontroller, and upgrading to a USB based storage media over the currently used 8-pin EEPROM.

ACTIVITIES

Calcutta Electric Supply Corporation (CESC) Knowledge Carnival 2019 *March 2019*
Presented a technical paper with a batchmate, on "*A Networking Scheme implementing IT on Power Distribution Lines*", and was awarded 1^{st} Runners Up. The theme was "*Digital Application for Process Improvement in Power Sector*". Our proposal covered a high-level implementation of a network of Smart Meters to monitor, analyze, and control power consumption, for attaining "*operational efficiency*" by a) achieving better collection, b) countering electricity theft, and c) improving load management.

Kharagpur Winter of Code *December 2019 – January 2020*
Participated in *IIT Kharagpur*'s Open Source development event organised by *Kharagpur Open Source Society* (*KOSS*), and contributed to two web-based projects and a library of Data Structures and Algorithms. I have written code in *HTML*, *CSS*, *JavaScript*, *TypeScript* (*Angular*), *JQuery*, and *PHP* for the web-based projects, and in *Java* for the Data Structures and Algorithms library. My work was concentrated around restructuring and refactoring existing code, fixing some UI related issues, and general enhancements. I have made 36 commits and created 7 pull requests over a 5-week period.

NOTABLE PROJECTS

GitHub Profile: github.com/meganindya

Route Plotter **Python** (Image Processing) *OpenCV, NumPy, Skeletonize*
Traverses the shortest path between two points in a map.

- Thresholds (*Otsu*) the image to create a mask and extracts the roads, using contours in *OpenCV*.
- Generates a skeleton of the road area, using *Skeletonize*, and converts to graph, using *SKNW*.
- Identifies the closest nodes from the centroid of origin and destination areas, and classifies them as initial and final nodes, respectively, of the graph.
- Uses *A* Algorithm* to find the shortest path between the said nodes on the graph; the path is plotted on the actual map using *MatPlotLib*.

Self Learning Snake **Web** (Deep Learning) *JavaScript, p5.js*

A replication of the classic snake game where the snake learns to live longer while scoring points.

- Uses the head's distances from the fruit, tail, and wall, as neural network input.
- Network output is one of four directions (top, right, bottom, left).
- Uses *Genetic Algorithm* for evolving — each generation has 500 snakes and 300 moves each; 100 moves are rewarded on eating the fruit with a maximum of 500 moves; neural networks of some of the fittest snakes are *crossed* for reproduction.

Pet Classifier **Web**, **Python** (Deep Learning) *fast.ai*

Classifies 37 breeds of dogs and cats from their images, and displayed through a basic web interface.

- Dataset having 37 classes with around 200 images per class, collected from Kaggle.
- Model is trained with a ResNet-34 architecture for 8 epochs.
- The Web Interface runs on a Python server.

Trip Finder **Web** (Algorithms) *p5.js, Flask*

Finds a set of trips to take to travel from one point to another, in a map.

- Provided are large lists of information about routes, stops, trips, and time stamps, as `.csv` files.
- A graph is created by parsing the comprehensive information and plotted on a map section.
- Selects some of the most optimal routes with respect to travel duration, number of trip changes, waiting duration, etc. by probing along a heuristic destination direction; *A** and *Breadth-First Search* algorithms are used.

College Database **Web** (Databases) *JavaScript, PHP*

A web application to interact with a college database of courses, instructors, students, containing course mapping, marks, attendance, and per-person information.

- Administrator can edit personal details, as well as courses, instructors, departments.
- Instructors can update per-student marks and attendance in their courses.
- Head of Department can choose instructors for courses under his/her department.
- Students can view their respective information.

Downasaur Game **C** (Computer Graphics) *FreeGlut* (*OpenGL*)

A graphics application replicating the *Downasaur* game on Google Chrome.

[*AI Version*] (Deep Learning) *Processing*

The Dinosaur learns to play the game by itself, by learning when and how much to jump.

- Neural network inputs are height, width, spacing, and distance to cacti.
- Network output is either a high jump or a low jump.
- *Genetic Algorithm* is used for evolution.

[*Ongoing Project*]

Human Activity Recognition **MATLAB** (Machine Learning) *Weka*

Predicts class of activity a person is involved in, based on movement traces.

[*Ongoing Project*] [*for Smart India Hackathon 2020*]

Ship Detection from SAR Images **Python** (Image Processing, Deep Learning) *Sentinel Toolkit*

Estimates the size and geographic location of ships from SAR images of ocean area.

TECHNICAL STRENGTHS

Programming Languages	Java, Python, JavaScript (TypeScript, JSX), C/C++, C#, PHP
Python Technologies	NumPy, OpenCV, PyTorch, Tensorflow
Development	Web Development (React, Angular, Flask, Node.js)
General Tools	MATLAB/GNU Octave, BASH, Git, LaTeX
Modelling	AutoCAD, SketchUp, Fusion 360
Areas of Interest	Deep Learning, Computer Vision, Image Processing

RELEVANT COURSES

Programming and Data Structures, Design and Analysis of Algorithms, Discrete Mathematics, Formal Language and Automate Theory, Digital Logic and Circuit Design, Computer Organization and Architecture, Microprocessors, Operating Systems, Database Management Systems

HOBBIES AND PASSIONS

3D Modelling	I have an interest in buildings and interior design. In my free time, I have been involved in designing creative elements of rooms, full renderings, and general paraphernalia, for over 8 years. I have a 3D warehouse profile which contains a few samples of my works.
Graphics	Digital photo editing, corrections, designing graphics like logo, fliers, cards, etc.