Sabyasachi Purkayastha

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Education

The University of Hong Kong | B*achelor of Engineering* | Class of 2024

Major: *Computer Science,* ***Minor:*** *Finance,* ***Focus:*** *Financial Computing.*

Awards: HKU Foundation Entrance Scholarship **(Full Tuition)**.

Roles: Co-President UNICEF HKU, HKU Student Ambassador, HKU Equal Opportunity Ambassador.

Highlight Courses (*TBC by year 3): DSA, Computer Organization, OOP & Java, Modern Technologies on WWW, Computer and Communication Networks*, Database Management Systems*, Machine Learning*, Software Engineering*, Algorithm Design*, Interactive Mobile Application*

Work Experience

THALES Group | Software Engineer | June 2022 - Present

- **Single handedly developed and released** a big-data analytics platform that constructs passenger journey in MTR stations with high accuracy rates and predictions on specific variables. Transformed transit data to mobility insights using Grafana Docker Container, TypeScript, React, Open Layers, Turf.js, Apache Echarts, Moment.js, Chakra UI, thus significantly improving passenger satisfaction, and enabling urban rate to operate more efficiently.
- **Created a Grafana architecture** consisting of Isochrone, Platform Level System Map, Platform crowding station KPI System map. Integrated Multilevel Dijkstra's, Contraction Hierarchies and Chaikin's Algorithm to identify friction points in the MTR network from the data from the ticketing machines and tap-in tap-out barriers in the MTR to recreate a single customer journey on the network.
- **Implemented a "Marey Diagram"** to visualize train schedules, passenger demographics, station occupancy and route utilization by capitalizing D3, Bootstrap, Glyphicons, Underscore, D3-tip thus enabling MTR operators to take proactive decisions before problems become critical and to optimize station facilities.
- **Managed and maintained** clickhouse database consisting of several thousand data points on MTR Trips and locations and capitalized SQL using DBeaver to retrieve data on waiting time, platform occupancy and train occupancy to prevent future platform crowding.

GrinBean Limited | Full Stack Developer | December 2021 – January 2022

- **Recreated** legacy UI system using Vue and redesigning the dashboard using Apache Echarts, providing powerful data insights and customizable visualization.
- **Seamlessly** developed data pipeline for IoT device and server using Express and wrote tests for authentication, authorization and output using jest.
- **Contributed** to the text-based data mining and information extraction to train and modify the data driven AI model to achieve greater efficiency.

HKU Business School | Research Assistant | November 2021 – January 2022

- **Increased the speed of data extraction by 60%** via implementing an algorithm that recognized required data type, instantly providing it to the project, saving countless hours of manual labor.
- **Applied empirical analysis** and computer simulation on EV Stocks to examine the correlation and causality between the value of the stock and company-wide reports.
- **Forecasted the stock prices** of S&P 500 companies using time series analysis, univariate ARIMA models and derived visualized market segments of those firms using data from CrunchBase by creating custom data pipelines using the tf.data.datasets API.

Highlight Projects | See more at shoh4g.github.io

GOD's Eye | ***A Brain Tumour Classifier to detect cancer from MRI Images*** **|** GitHub

- **Integrated multilayer perceptron (**MLP) for image identification. Prevented curse of dimensionality and overfitting by utilizing the CNN model's template matching technique and convolution filters.
- **Utilized pooling layers (max pool)** to reduce the dimension of the feature map as well as numbers of parameters to learn and the amount of computation performed in the network. Added a padding layer to enable the convolutional filter for capture all features from the image.
- **Implemented flattening** operation to flatten the output of the convolutional layers to create a single long feature vector and connected it to the final classification model. Applied transfer learning via Mobile net modeling architecture to increase the accuracy of the model as well as avoid latency.

EXIT-Finder | ***text-to-speech app that guides the visually impaired (VIs) to their chosen exits in MTR Stations*** **|** Demo

- **Architected a mapping platform**, by leveraging BFS, DFS, Dijkstra's algorithm, and A* search algorithm, to provide personalized directions to VIs based on their step size, mode of preference (stairs, elevators, escalators), and existing facilities (tactile paths), to lead them from the elevator in the station concourse to their preferred exit.
- **Capitalized React Native Paper** material design library to make the UI more user-friendly for the VIs as well as integrated expo-speech to allow text-to-speech functionality in the app.

CodeRed | ***a real-time visualizer for global COVID-19 statistics*** **|** Visualize

- **Developed a World Health Organization like platform by utilizing** the open API disease.sh to visualize real-time COVID-19 statistics globally.
- **Revamped the dashboard** using JavaScript, Chart.js, Material UI, Chart.js, React hooks, React-leaflet to enhance interactivity via real time demonstration of statistics through the aid of global map, and other data visualizing tools.

Sound Alpha | ***Decentralized Music NFT Exchange Platform paired with Abelian infra|*** GitHub

- **Designed and optimized** the front-end of the platform using React, Next.js, capitalizing on the Ant-Design UI library and utilized Abelian infrastructure to enhance the post quantum crypto ecosystem.
- **Created and deployed** NFT smart contract (ERC-721 Token) into the Ethereum chain using MetaMask, Solidity, Hardhat, Pinata, and Alchemy.

Notable Awards, Certifications, and Hackathons

HKU 3rd Engineering Inno-Show 2020 | ***Runner – Up*** **|** Demo

Developed an interactive game called Play2Study that uses gamification, targeted towards HKDSE candidates.

Easy-View & HKU Master's Program Hackathon 2022 | Top 4 Finalist + Award for the product with the most positive social impact

Led a team of 4 into developing a personal wealth management mobile app, designed for the underserved and unbanked community.

IEEE Web 3 Dev Hackathon 2022 | ***Top 4 among 250+ participants + Award for Best Team***

Led a team of 5 into developing a decentralized music NFT exchange platform and capitalized Abelian network's post Quantum Cryptography.

JP Morgan Chase | ***Finance for Non-Finance program.***

Selected among 45 individuals from the APAC region to complete a 2-week Finance training program under the guidance of JP Morgan associates.

JP Morgan Chase and Co| ***Software Engineering Virtual Experience Program***

Created an interface using React with a stock price data feed and displayed data visually to traders.

JP Morgan Chase and Co | Agile Virtual Experience Program

Deepened understanding of Agile and Scrum at JPMC whilst also performing backlog refinements and sprint reviews.

JP Morgan Chase and Co| ***Cybersecurity Virtual Experience Program***

Deepened understanding of Application Security Fundamentals and analysed a large data set of fraud in financial payment services.

Skills

Core:	Python, Java, JavaScript, Typescript, C/C++, Shell (Scripting), Linux/Unix.
Machine Learning:	Regression, Classification, ARIMA, Ensemble Learning, CNNs, RNNs (GRU, LSTMs), Transfer Learning for NPL and Computer Vision.
Web, App & Database:	React, Vue.JS, React Native, D3.JS | NodeJS & Express | SQL, MongoDB, ClickHouse