Raj Ray Chaudhury

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Education

Drexel University   **GPA: 3.93/4.00**

*Bachelor of Science in **Computer Science (Honors)**, Minor in **Data Science***

- **Dean's List** (All quarters)
- **Clubs:** Drexel Algorithms (Board member), Drexel Ventures (Treasurer)
- **Selected Coursework:** Data Structures & Algorithms, Systems Programming, Software Architecture, Artificial Intelligence, Programming Language Concepts, Advanced Web Development, Database Systems and Design, Probability and Statistics

Experience

Amazon   **Sept 2022 - Mar 2023**

Software Development Co-Op   *North Reading, MA*

- Curated ARMBench, the largest available benchmark dataset of images (**450k** labels on **190k** unique objects) captured in an industrial product-sorting setting, that was presented at the **RSS conference (Korea)** in July, 2023.
- Developed an **automated data ingestion pipeline** using **AWS CDK** and **Lambda** that picks raw data collected in an Amazon warehouse from **S3** and ultimately submits clean data into the benchmark dataset.
- Generated **segmentation masks** with **opencv** to facilitate human annotation for rigorous ground truth validation of the dataset.
- Trained a baseline Mask RCNN instance segmentation model using **Pytorch** to achieve a **12%** increase in mean average precision.
- Built a dashboard in **C#** that lets users query **item matrix** databases and deploy **image classification** jobs on **Sagemaker**.

Susquehanna International Group LLP   **Sept 2021 - Mar 2022**

Software Development Co-Op   *Bala Cynwyd, PA*

- Wrote low latency code in **C++** to save **$40k** annually by detecting duplicate overnight jobs on **Tidal** workload automation.
- Developed a **.NET app** for the options team to concurrently audit **500+** log files through simultaneous optimized parsing.
  - Leveraged Python's **multiprocessing** module to maintain shared file queues and improve back-end processing time by **55%**.
  - Maintained fully **automated CI/CD** pipelines for code deployment using **GitLab, Team City and Octopus Deploy**.
- Built a **REST API** using Python's **Flask** framework, to let traders generate **CSVs** by querying historical **MySQL** databases.

Drexel College of Computing and Informatics   **Apr 2021 - Present**

Teaching Assistant for Algorithms   *Philadelphia, PA*

- Debugged programs and guided 90 students through course material to thorough understanding of compound **data structures**.
- Developed shell script that uses **regular expressions** to transfer grades from third party ed-tech software to student portal.

Drexel Pennoni Honors College   **Jan 2021 - Sept 2021**

Research Assistant   *Philadelphia, PA*

- Implemented a novel algorithm (based on TF*IDF) for **automated test classification**, reducing categorization errors by **18%**.
- Applied **k-NN (k-Nearest Neighbours)** to **train and test models** on **10k** randomly selected New York Times articles.

Projects

LearnAI | *React.js, Flask, Postman, Docker*

- Developing a containerized application for college faculty to fine-tune **LLM** models and guide students through learning activities.
- Using **OpenAI** API endpoints in **Langchain** to interact with agents while maintaining conversation chains with buffer memory.

RubikAI | *Python*

- Implemented a rubik's cube solver using **breadth-first** search, **depth-first** search and **A*** (Manhattan Distance) heuristic.
- Employed **pattern databases** and **2P pruning** algorithms to optimize for minimum moves by reducing the search space.

Survey Generator | *Java*

- Reusable **object-oriented** software implemented using design patterns and scaled out using **test-driven** development in **JUnit**.
- End-to-end survey generation system that lets users create surveys, record responses, tabulate grades and **serialize** data.

Technical Skills

Languages : C++, Python, Java, C, C#, HTML, CSS, JavaScript, SQL, Bash, AWK, Racket

Databases : DynamoDB, Oracle Database, PostgreSQL, MySQL, MongoDB

Amazon Web Services : S3, Lambda, Sagemaker, EC2, API Gateway, Cloudwatch, EventBridge, Simple Notification Service

Tools : Node.js, Docker, .NET, Linux, Pytorch, Heroku, React.js, Postman, Ruby on Rails , Bootstrap, Git, Jira, Tableau