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Boulder, Colorado

RAJ CHANDAK

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EDUCATION

Boulder, USA **University of Colorado - Boulder** **Aug 2019 – May 2021**

- Master of Science - **Computer Science** with specialization in **Data Science & Engineering**; **GPA - 3.96/4**
- **Relevant Coursework -** Algorithms, Natural Language Processing, Big Data Architecture, Object-Oriented Analysis, Datacenter Scale Computing, Data Visualization, Data Analytics, Capstone Project - Data Analytics in an IoT Network.
- **Skills Learned -** Algorithmic Thinking, Distributed Computing, Data Analytics and Visualization, Data Modelling, Data Management, Cloud Technologies, NoSQL Databases, Big Data Processing, Container Orchestration, Deployment Automation using CI/CD techniques, Stream Processing.
- Recipient of **Summer 2020 Graduate School Fellowship** for excellent academic performance.
- **Graduate Student Assistant** for Data Structures course - Conducting recitations, holding office hours, creating quizzes.

Mumbai, India **Veermata Jijabai Technological Institute (VJTI)** **Aug 2014 – June 2018**

- Bachelor of Technology - **Computer Science & Engineering**
- **Relevant Coursework -** Machine Learning, Artificial Intelligence, Data Structures, Databases, Software Architecture, Data Mining & Warehousing, Statistics & Optimization, Cloud Computing, Parallel Computing, IoT, Network Systems.
- **Skills Learned -** Programming in Python & Java, Database Systems, Architecture Design, Web and App Development, Statistical Analysis, ETL Techniques, Design Patterns, Scripting, Machine Learning, SDLC Techniques, Version Control.
- Achieved podium finishes in 4 national and state-level **hackathons**.
- Awarded a **Certificate of Appreciation** on National Science Day, 2017 for excellent performances in Hackathons.

TECHNICAL SKILLS

Languages: Python, Java, JavaScript, SQL, Bash, HTML5, CSS3, Typescript, XML, C#

Databases: MySQL, OracleDB, AWS RDS (AuroraDB), MongoDB, Elasticsearch, DynamoDB, Hazelcast

Big Data Processing: Spark Streaming, Kafka, MapReduce, HDFS, Zookeeper

Data Skills: Data Modelling, Data Profiling, Statistical Analysis, ETL, Scikit-learn, TensorFlow, Pandas, Tableau, D3.js, Altair

Web/App Technologies: React.js, Node.js, Angular 8, Bootstrap, Jest, Spring Boot, REST Architecture, AJAX, .NET, Flask

DevOps: AWS, GCP, Docker, Kubernetes, GitLab CI, Circle CI, Agile/Scrum, Git, GitHub, GitLab, SVN

WORK EXPERIENCE

Software Engineering Intern **GoNation** **May 2020 – Present; Remote**

- Developed an end-to-end data analytics tool to provide **business intelligence** to local business owners.
  - Performed descriptive **Statistical and Trend Analysis** on quantitative Google Analytics data to model various metrics like user trends, preferences, and demographics, thus enabling local business owners to make **data-driven decisions**.
  - Streamlined the **data ingestion** pipeline and **automated loads into DynamoDB** by using scheduled cron jobs.
  - Built a custom **visualization engine** using D3.js at the core that provided dynamic and interactive data visualizations.
- Executed an **event-driven build automation** architecture for the static site build and deploy process using Netlify.
- Wrote a node.js module using serverless **lambda** functions to perform **data aggregation** on DynamoDB streams.
- Used the Singleton Design Pattern to implement multi-cart logic for our online ordering platform.
- Developed several admin components in React.js that significantly improved customer management and onboarding.
- Worked on a **data-directed** asset management pipeline to keep track of the customer onboarding progress.
- Developed a virtual business onboarding tour in React.js that assisted businesses to understand the GoNation workflow.
- Implementing an admin feature for real-time remote toggling and management of GoNation TVs installed at client sites.

Software Engineer (Analyst) **Credit Suisse Group AG** **July 2018 – May 2019; Pune, India**

- **Spearheaded** the migration of a full-stack Java Applet based legacy application using Angular 5 and Spring Boot.
  - Coordinated with the Principal Architect and Project Owner to create a **scalable solution** that would improve on KPIs, like application responsiveness, and could also be used as a benchmark for future legacy application migration.

- Redesigned and implemented the complete front-end from the ground up using a **module-component** based Angular 5 architecture and engineered reusable components with an easy plug-in interface.
- Designed and implemented a **RESTful Web Services Model** in Spring Boot for efficient data communication with the front-end without affecting the existing microservice architecture.
- Developed a custom dashboard in Angular 5 that provided portfolio managers with **real-time performance analysis** as well as **data profiling** of historical transactions of their financial investments.
- Performed complex **DML** operations in **PL/SQL** for data manipulation in an **OLAP** database.
- Actively engaged in the **Agile/Scrum** process and presented key milestone updates to all the stakeholders.
- The application achieved an overall performance gain of **~ 55%** with **~ 40%** improvement in application stability.

- Developed a **Prefix Tree**-based searching algorithm to give real-time portfolio suggestions based on current user input.
- Became the youngest recipient of the ***Spartan Award*** (most productive employee) for demonstrating excellent progress and leadership, and for making timely deliveries with minimal defects.

Research Intern **Indian Institute of Technology (IIT), Kanpur** **Spring 2018; Kanpur, India**

- Researched on the creation and analysis of a **complex decryption algorithm** to be used to decrypt custom-made and proprietary anti-counterfeiting labels that were essentially a layer of custom engravings on top of a custom QR code.
- Applied **constraint frame processing** techniques using the Scikit-image package that relied on an underlying Convolutional Neural Net for image classification.
- Used Google's mobile vision framework to then scan the extracted QR code and combine the two results to determine the authenticity of the label.
- Our algorithm achieved a classification accuracy of **~ 87%**.

Software Engineering Intern **Credit Suisse Group AG** **Summer 2017; Pune, India**

- Designed and developed a high density and **distributed cache** using **Hazelcast** In-Memory-Data-Grid to store static and infrequently changing business data, thus reducing network latency, and significantly improving access times.
- Deployed the Hazelcast cluster on an **AWS-EC2** environment and integrated it with the existing product modules.

SELECTED ACADEMIC PROJECTS

COVID-19 Campus Density Tracking Tool (Summer 2020): Using Wi-Fi logs to estimate occupancies of all campus locations.

- **Architected** the complete backend and provisioned the deployment in a CentOS environment.
- Automated the CI/CD workflow by using GitLab CI to make timely deployments in a virtualized Conda environment.
- Automated the **ETL** process by developing a Snakemake pipeline that used cron jobs to perform hourly **data extraction** from Wi-Fi logs, **data cleansing** by eliminating sensitive user information, and **data aggregation** which used differential privacy to compute hourly and daily building, floor, and room occupancies.
- **Modelled** and deployed **MongoDB** clusters with effective database indexing and performed efficient data aggregation using advanced queries.
- Used a microservice-based architecture to develop a **Flask** API with minimal response latency.

Capstone Project - Advanced Analytics & Monitoring Tool for Jobsite Leads (Present): Using location-tracking sensors and anchors to monitor worker safety at construction sites.

- Designed an **n-tier architecture** that included container based microservices, a web application, relational databases, and a load balancer, and deployed it in an AWS environment.
- Implemented container orchestration for deploying the various modules on **AWS ECS**.
- Wrote unit and integration tests in .NET for the microservice based backend.
- Writing a module in .NET that provides advanced analytics information and data summarization to jobsite leads.

Real-Time Stream Processing to Detect Fraudulent Transactions (Present): Using Spark Streaming and Spark MLLib to detect fraudulent credit card transactions in real-time.

- Streamlined the Kaggle dataset to produce a real-time stream using **Kafka**.
- Performing batch processing using **Spark Streaming** by consuming the real-time Kafka stream and applying our ML model using Spark MLLib.
- Developing a module that stores the results of our real-time batch processing framework in **HDFS**.

Presidential Election Sentiment Analyzer (Spring 2020): Data analytics web-app using politically filtered Tweets (GitHub)

- Implemented a Twitter-scrapper service to scrape historical tweets and wrote an hourly Cron job to fetch live tweets.
- Used **Test Driven Development (TDD)** to develop and tested the complete front-end using React.js and Jest and assisted in CI/CD setup using Buddy.

Restaurant Recommender (Spring 2020): Ranking restaurants based on user query using big data processing (GitHub)

- Designed, dockerized and deployed an event-driven **Elasticsearch** service for providing query suggestions.
- Configured various DevOps operations and setup the CI/CD pipeline using GitHub, CircleCI and GCP.

Distributed Clipboard (Spring 2020): Synchronizing clipboard content across user devices (GitHub)

- Developed a real-time **distributed clipboard** using Web Sockets at the core that allowed users to copy/paste content across multiple platforms.
- Containerized and deployed the node server, MongoDB database, and web app using Docker Swarm and GCP.

RESEARCH EXPERIENCE

Background Screening using Blockchain (2019): Presented virtually at the 2019 International Conference on Advances in Computing, Communication and Control (ICAC3), with research published in IEEE Explore.

- Proposed a modern solution to the age old and slow background screening process using Distributed Ledger.
- Provided empirical data to back research by developing a proof of concept using the Ethereum API.

Visual Assistance using Image Processing (2018): Presented virtually at 2018 International Conference on Recent Trends in Computational Engineering & Technologies (ICRTCET), with research published in Thomson Reuters indexed GJESR.

- Implemented the feature selection and PCA phases and used tiny-YOLO framework for rapid image classification.
- At the core, we implemented a CNN with 3 Convolutional Layers, 3 Max Pooling Layers and 3 Fully Connected Layers.