Smayan Ranjan

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Education

University of Michigan — **Ann Arbor, MI**

Masters of Science in Applied Statistics — *Expected May 2027*

- Coursework: Probability and Distribution Theory, Statistical Theory

University of Michigan — **Ann Arbor, MI**

Bachelors of Science and Engineering in Data Science - ***GPA: 3.8/4.0*** — *Expected May 2026*

- Coursework: Advanced Operating Systems, Database Management Systems, Data Structures and Algorithms, Machine Learning, Web Systems, Computer Organization, Regression Analysis, Computational Linguistics

Experience

Amazon Web Services — **May 2025 – August 2025**

Software Development Engineering Intern — *Minneapolis, Minnesota*

- Reduced network monitor initialization time by 75% by designing and implementing an EC2 instance warm pool, cutting average customer wait time from 8 minutes to under 2 minutes and improving the first-contact user experience.
- Engineered a warm pool architecture that proactively maintains pre-initialized prober instances across availability zones by leveraging AWS Auto-Scaling Group(ASG) features to ensure high availability and up-to-date configurations.
- Developed a fallback mechanism that detects ASG exhaustion and safely reverts to legacy provisioning with automatic metric emission, ensuring a graceful fallback scenario and uninterrupted monitor creation.
- Identified a potential subnet exhaustion failure case that could silently break instance provisioning, and implemented detection logic to notice low IP availability and proactively trigger ASG reconfiguration before failures occurred.

Functional Food Center — **May 2024 – August 2024**

Software Engineering Intern — *Dallas, Texas*

- Developed the website for FFC's International Satellite Conference using Front-end Framworks such as HTML/CSS and Javascript, hosting over 4,000 attendees from 125+ countries.
- Updated and maintained website content related to upcoming conferences using data managed on Google Sheets, including speaker profiles, abstract submission details, and conference program schedules.
- Enhanced the secondary website for FFC's journal publication services by constructing React components for publications, streamlining the management of scientific research articles in the field of Functional Foods.

Wolverine Sports Analytics — **January 2024 – May 2024**

Machine Learning Engineer — *Ann Arbor, Michigan*

- Implemented a Ridge Regression Model to predict future NBA MVP winners by ranking 40+ basketball metrics.
- Used Mean Squared Error, Average Precision, and a Backtesting function to calculate model accuracy, resulting in over 70 Percent accuracy for placing players into the top 5 vote-recievers through the past 25+ years.
- Web Scraped data from the past 30+ years using Selenium, resulting in over 600,000 data points stored using mySQL.

Projects

Custom Search Engine | *Python, Javascript, Flask, ReactJS, SQLite, MapReduce, REST APIs*

- Developed a full-stack distributed search engine using Python, MapReduce, and Flask that supports dynamic query processing with TF-IDF scoring and PageRank integration over large crawled HTML datasets.
- Implemented a multi-stage MapReduce pipeline to clean, parse, and index web documents into a segmented inverted index, with cosine normalization and document frequency statistics for relevance scoring.
- Built a RESTful Index server API that serves search results from distributed inverted index segments in parallel.
- Created a frontend Search server and designed auxiliary components including a SQLite-backed metadata database, automatic setup scripts, and init tooling to streamline deployment, testing, and server orchestration

Money Monitor | *Javascript/TypeScript, MERN(MongoDB, ExpressJS, ReactJS, NodeJS), TailwindCSS*

- Developed a financial tracker application that allows users to monitor and aggregate their financial history.
- Created RESTful APIs using Express.js and Node.js, enabling seamless interactions with a NoSQL database.
- Implemented secure user authentication using Clerk, ensuring users can only access and modify their own financial data.

Technical Skills

Languages: Python, C++, C, JavaScript/TypeScript, Java, Kotlin, R, HTML, CSS, SQL
Technologies: Amazon Web Services(AWS), Git, Model Context Protocol(MCP), Flask, MongoDB, ExpressJS, ReactJS, NodeJS, TailwindCSS, TensorFlow, Scikit Learn, Pandas