Broderick Rains

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EDUCATION

University of Michigan – Ann Arbor, MI **Aug. 2023 – May 2027**
Bachelor of Science, Computer Science GPA: 3.8 / 4.0

- Relevant Coursework: Data Structures and Algorithms, Computer Organization, Web Systems, Database Management Systems, Data Analysis, Discrete Math, Theory of Computation, Linear Algebra, Calculus

EXPERIENCE

BASF | *Software Engineering Intern* – Wyandotte, MI **May 2024 – Present**

- Developed and deployed 2 interactive full-stack web applications in Python with Dash, Redis, and Docker to streamline molding data retrieval, visualization, modification, and comparison for engineers and salespeople.
- Architected and implemented a full-stack application using Microsoft Power Suite and Dataverse to centrally store and generate technical data sheets for 1000s of polyurethane systems, reducing manual documentation.
- Engineered a RESTful API with Swagger UI using the FastAPI framework to bridge requests from Power Automate to internal web applications with bespoke capabilities, uniting the BASF development environment.
- Presented software to business and technical stakeholders weekly with live demos and PowerPoint presentations.

Undergraduate Research Opportunity Program | *Research Assistant* – Ann Arbor, MI **Aug. 2023 – April 2024**

- Assessed the reliability of functional diversity databases by cleaning data, constructing optimized Gower's dissimilarity matrices, performing Mantel tests, and mapping IUCN spatial data onto EPM grids in R.
- Designed and presented a poster with abstract, methods, graphics, and summary at the University of Michigan UROP Spring Symposium, winning the UROP Blue Ribbon for outstanding research and presentation.

TECHNICAL SKILLS

Languages: C/C++, Python, Java, JavaScript, R, HTML/CSS, Bash
Technologies/Frameworks: Flask, Dash/DashVTK, SQL, ReactJS, Microsoft Power Platform, AWS, Redis, Cypress

PROJECTS

Search Engine – Python, Bash, HTML/CSS

- Produced a scalable search engine similar to Google, implementing an inverted index of web pages using a pipeline of MapReduce programs, a REST API, and UI to return the top 10 search results.

Instagram Clone – JavaScript, Python, Bash, HTML/CSS (ReactJS)

- Developed a clone of Instagram that enables CRUD operations for accounts, posts, comments, and likes via a SQL database, Flask, REST API, and ReactJS components for posts and feeds. Deployed on EC2.

Pipelined Processor – C

- Built a 5-stage pipelined processor simulator for the University of Michigan's LC2K ISA, handling data and control hazards, register forwarding, and branch prediction for assembly instructions.

COMMUNITY SERVICE

Kids for Kids | *President and Co-founder* **June 2012 – Aug. 2022**

- Led a 501(c)(3) non-profit organization that prevented elementary summer learning loss, measured by NWEA results, by teaching +50 students the core curriculum and Spanish each summer for 10 years in weekly classes.
- Coordinated with community leaders to support the program via donations, housing, and pipelines.