

MARCUS ADAIR

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PROFESSIONAL EXPERIENCE

Scientific Computing and Imaging Institute

Salt Lake City, UT

Graduate Research Assistant

Aug. 2023 – Present

- Developing On-Demand Fakequakes (ODF), a full-stack web app with an AWS Cloud workflow for launching earthquake simulations, targeted for NASA and other scientific use cases
- Integrating ODF with National Data Platform (NSF-funded cyberinfrastructure) for dataset registration and discovery capabilities via API requests and secure authentication (Keycloak)
- Built a CI/CD pipeline using GitHub Actions to automate Docker image builds, deployments on AWS, and updates to the AWS CloudFormation stack via AWS CDK in Python

University of Oregon

Eugene, OR/Salt Lake City, UT

Full Stack Software Engineer Intern

May. 2024 – Aug. 2024

- Developed a Python web app with an interface for customizing earthquake simulation parameters and created a parallelized workflow for simulations on AWS
- Containerized the web app and simulation software and dependencies using Docker, deploying them on AWS ECS Fargate
- Leveraged AWS Lambda, S3, ECS, IAM, CloudFormation, and other AWS services to automate Cloud instance spawning and workflow management

Scientific Computing and Imaging Institute

Salt Lake City, UT

Undergraduate Research Assistant

Mar. 2022 – Aug. 2023

- Developed an automated parallel workflow for simulations using Open Science Grid, Python, and Bash, reducing simulation time from 20+ days to under 1.5 days for 30,000+ simulations
- Containerized simulation software and dependencies with Singularity
- Wrote Python code for simulating the offloading of workflow jobs to the Cloud and conducted experiments

PROJECTS

Adaptive B-Epsilon Tree (C++)

- Enhanced an industry-level C++ database by implementing an Adaptive B-Epsilon Tree with dynamic branch nodes
- Designed a windowed monitoring system for tracking the workload distribution (reads/writes)
- Wrote Tree shortening method and integrated it into the code-base's recursive query method, successfully improving read-optimization on database queries

Spatial Enrichment Data Engine (TypeScript, Angular)

- Led front-end development on a geocoding web application in collaboration with Idaho National Laboratory for senior capstone project
- Leveraged Angular/.NET stack, TypeScript, CSS/HTML, and more to implement front-end
- Designed Angular components, interfaced with the Esri API to integrate library widgets, built GET requests to the back end, documented and implemented user stories

SKILLS

Python, Bash, JavaScript/TypeScript, C#, HTML/CSS, Angular, SQL, .NET, Agile, Git, Containers, AWS, CI/CD

EDUCATION

University of Utah

Salt Lake City, UT

Master of Science in Computer Science

May 2025

- Courses: Graduate Algorithms, Deep Learning, Adv. Database Systems, Human Computer Interaction

University of Utah

Salt Lake City, UT

Bachelor of Science in Computer Science

May 2023

- Web/Mobile Development Track Certificate
- Courses: Web Software Architecture, Mobile App Programming, Database Systems, Algorithms

NOTABLE ACHIEVEMENTS

- First Author on ACM-Published Paper: (<https://dl.acm.org/doi/10.1145/3624062.3624276>) Nov. 2023
- SC23 Workshop Presenter: WORKS23 Nov. 2023