Judah High – Principle Software Engineer

github.com/judahhigh   https://jhigh-portfolio.fly.dev/   linkedin.com/in/judah-high

Experienced full stack software engineer committed to mastering a wide range of technologies and methodologies, with a passion for crafting market-ready products through rigorous development practices, thorough testing, monitoring, and maintenance.

Core Competencies

- Software Engineering
- Application Engineering
- Test Driven Development
- Continuous Integration / Continuous Delivery
- Configuration Management
- Cloud-native Software Engineering
- Agile | Scrum | Kanban | Lean
- Behavior Driven-Development

- Functional Programming
- Object Oriented Programming
- Clean Code
- Data Engineering
- Auth (Oauth2, JWT, Biscuit)
- DevOps (Containerization & Orchestration)
- RESTful API development
- Microservices

Summary

- **Languages**: Rust, Python, Golang, TypeScript, JavaScript, HTML/CSS, SQL, C++, C, Fortran, Bash, GlueSQL
- **DataBases**: MySQL, PostGres, NoSQL, SQLite, Redis, Prisma, Diesel, AWS (Aurora, Dynamo DB, RDS, Redshift, S3)
- **Frameworks**: Actix Web, FastAPI, Rocket, Svelte/SvelteKit, Yew, React, Tailwind CSS, Skeleton UI, Threlte, Tauri, Go-Kit
- **Runtimes, Servers, Bundlers:** Next.js, Node.js, Bun, Trunk, Tokio, Nginx
- **Data Analysis & Manipulation:** Pandas, Polars, PySpark
- **Testing:** PyTest, Cargo, Great Expectations, MyPy, Pre-Commit, Tox, Moto, Black, flake8
- **DevOps:** Docker, Git, Kubernetes, Jira
- **Tools:** VS Code, Visual Studio, Postman, PGAdmin, DB Browser for SQLite, Pyenv, Pipenv, Yarn, npm, VIM
- **Serverless Compute:** AWS (Lambda, Step Functions, Batch)
- **Cloud Infrastructure:** AWS (ALB, ECS, EKS, Fargate, VPC, API Gateway, AppSync, CDK)
- **Cloud DevOps:** AWS (Amplify, CloudFront, Route53, CloudFormation, CodeArtifact, CodeBuild, CodePipeline, CodeStar, IAM, SecretsManager, ECR)
- **Monitoring**: AWS CloudWatch, DataDog
- **Auth**: AWS (Cognito, ALB, EKS), MS (AD)
- **Cloud Data Analysis/Insight:** AWS (Glue, Athena, QuickSight)
- **Messaging & Event Processing:** AWS (EventBridge, SQS)
- **Operating Systems:** Windows, Unix, Mac OS, Linux
- **Methodologies/Practices/Standards**: Agile, BDD, Biscuit auth, CI/CD, Clean Code, Cloud-native Software Design, Data Engineering, Design Patterns, DevOps, FP, HPC, JWT, Oauth2, OOP, Parallel Programming, Serverless, Software Architectures (Client-Server, Event-driven, Layered, Microservices, MVC, REST), TDD

Education

- Computational Quantum Chemistry, Ph.D., North Carolina State University
- ACS Certified Chemistry, B.S., Appalachian State University
- Forensic Science, B.S., Appalachian State University

Publications

- High, J. S.; Rego L. G. C.; Jakubikova, E. J. *Phys. Chem. A*, **2016**, 120(41), 8075-8084.
- High, J. S.; Virgil, K. A.; Jakubikova, E. J. *Phys. Chem. A*, **2015**, 119(38), 9879-9888.

Employment History

- **Principle Software Engineer, 2/2022-8/2023 - Remote**   Agenus, Inc.

Designed, Implemented, and maintained a suite of cloud-native clinical trial ETL data pipelines, web applications, and data exploration/analysis tools. Worked as part of a small team of 3-5 individuals working with IT and internal customers across several departments within the organization. Worked with customers to develop service level agreements to ensure the nature and operation of each product delivered. Within the team took on a technical lead role making major contributions on every project. Assisted in junior developer mentoring and task completion. Working in a fast-paced environment, delivered all products within 3-6 months.

- **Staff Engineer II, 5/2017-1/2022 - Hybrid**   Applied Research Associates

Designed, Implemented, and maintained a portfolio of software features and tools for a 30+ year physics-based simulation software product on a team of up to 50 scientists, developers, and engineers. The product comprised millions of lines of code across several languages, primarily C++ and Python. Nominated and maintained status as a technical owner for several portions of the codebase participating in design, maintenance, and review efforts. Mentored countless junior developers and engineers. Presented and provided demos for major and minor software updates to customers and investors. Created and maintained automated testing and reports to maintain the quality of the product and features delivered. Managed a large-scale effort (design, implementation, maintenance, budget, customer relations) for a specific product-line to enhance the primary physics-based simulation product. Developed and marketed new product lines enhanced with features imbued with capabilities sourced from my background in computational quantum chemistry. Given numerous technical achievement awards for contributions to existing and new products.

- **Research Assistant – Simulation Software, 8/2012-5/2017**   Agenus, Inc.

Designed, Developed, and Maintained software tools and services to enhance research efforts in the field of computational quantum chemistry primarily in C++, Fortran, Bash, and Python. Performed admin and maintenance operations for an on-prem supercomputing cluster focused on computational quantum chemistry efforts. Mentored junior members in the research laboratory in pursuits of new research. Executed all developed tools and services in pursuit of a Ph.D. in computational quantum chemistry, awarded in May of 2017. Collaborated with research colleagues in several countries to develop new features in computational quantum chemistry software leveraged in several research veins (see publications as well as publications referencing my work).

Professional Projects Highlights

Cloud-native data pipeline orchestration system   Agenus, Inc.
- **Languages/Technologies**: DataDog, Docker, GitHub, Python (Black, Boto, FastAPI, Mangum, Moto, Pytest, Tox), Rust (Rocket, Serde), AWS (ALB, API Gateway, Athena, CDK, Cloud Formation, Codebuild, CodePipeline, CodeStar, DynamoDB, ECR, EventBridge, Glue, IAM, Lambda, S3, SDK, SecretsManager, SQS, SSM, Step Functions)
- **Delivery time**: 6 months
- **Team size**: 5
- **Description:** System orchestrated clinical trial data pipelines using events on AWS.
- **Impact**: Accelerated the delivery of critical clinical trial data processing pipelines.

Cloud-native CRU~~D~~ web application for tracking clinical trial patient data   Agenus, Inc.
- **Languages/Technologies:** Azure AD, Docker, GitHub, Kubernetes, Python, Rust (Actix, GlueSQL, js-sys, WASM, wasm-bindgen, web-sys), TypeScript (AG Grid, React, Tailwind CSS), AWS (ALB, CDK, Cloud Formation, Codebuild, CodePipeline, CodeStar, Cognito, DynamoDB, ECR, EKS, Fargate, S3, SDK)
- **Delivery time**: 4 months
- **Team size**: 4
- **Description**: Web application provided a tabular data interface to track clinical trial patients from multiple trials. The app provided CRU~~D~~ capabilities and a full audit trail of all user- and system-derived patient data updates throughout the course of clinical trials.
- **Impact**: App-supported clinical trials cut manual tracking/processing efforts of supported trials by several hours per user per day.

Cloud-native, clinical data integration pipelines — Agenus, Inc.

- **Languages/Technologies:** GitHub, Great Expectations, MySQL, PostgreSQL, Python (Pandas, PySpark), Rust (Polars, Serde), AWS (Athena, Aurora, Batch, CDK, Cloud Formation, Codebuild, CodePipeline, ECR, ECS, Fargate, Glue, Lambda, Redshift, S3, SDK, StepFunctions)
- **Delivery time:** average 3.5 weeks/pipeline
- **Team size**: 3
- **Description**: With a total of 11 pipelines delivered, clinical data was ingested, integrated, and exposed as analytics-ready data sets to in-house clinicians, scientists, and statisticians.
- **Impact**: Word-of-mouth surveys conducted by my team revealed deployment of pipelines helped users within the company cut MS Excel time by over 4 hours every day.

Event Driven Calculation Engine — Applied Research Associates

- **Languages/Technologies:** C++, Python, Java, Qt, Spring, Bitbucket, Jira
- **Delivery time:** 6 months
- **Team size**: 4
- **Description**: An event-driven calculation engine to orchestrate calculation services for a physics-based simulation product comprising millions of lines of code and many calculation services.
- **Impact**: Integrated the new calculation engine within a new product-line released to a scoped section of product customers who were supported their use of the new product.

Bayesian Statistics Physics-based Prediction Model — Applied Research Associates

- **Languages/Technologies:** C++, Python, scikit-learn, Boost, C++ Standard Template Library
- **Delivery time:** 6 months
- **Team size**: 3
- **Description**: A Bayesian statistics-based model to predict the latent space of unobserved variables to assist the overall predictive capability of a well-established physics-based simulation software product.
- **Impact**: Integrated the new calculation engine within an existing product-line that upon release solved an entire set of problems the customer base was seeking to solve.

Physics-based simulation product interface overhaul — Applied Research Associates

- **Languages/Technologies:** C++, Python, Qt
- **Delivery time:** 5 months
- **Team size**: 4
- **Description**: Modernized a then 25-year-old physics-based simulation product by migrating the product to a new desktop application framework.
- **Impact**: Completed the migration ahead of time so that the modernized product could be packaged and released to a scoped section of customer participants, who were actively supported in the adoption of the new product and interface.

Quantum Chemistry Matrix Analysis Framework — North Carolina State University

- **Languages/Technologies:** Python, MPI4Py, Bash
- **Delivery time:** 5 months
- **Team size**: 1
- **Description**: Designed, Developed, and leveraged a computational quantum chemistry matrix analysis framework for scoped efforts along several research veins within my and others Ph.D. research.
- **Impact**: The framework resulted in the discovery of vital matrix features that provided answers to scoped scientific questions about the nature of various inter-atomic and inter-fragment quantum mechanical interactions leading to novel behaviors in photo-active molecular and extended systems.

Other Interests

- Powerlifting
- Backpacking
- Backcountry Motorcycling
- Summiting Mountains
- Side Projects
- Hard Sci-fi books