ZACH ALLEN

He/Him

IMPACT & EXPERIENCE

Bachelor's in Computer Science
2019-02 - 2022-08

at Western Governors University

Focused on Machine Learning and Project Management in a fully remote environment

Sofware Engineer *at* Pluton Biosciences
2021-03 - 2021-08

Data Engineering and Cloud Infrastructure supporting Bioinformatics & Genomics research

- **AWS Genomics Pipeline**
  Terabyte-scale AWS genomics pipeline to meet rapidly growing startup needs
  - Ensured strong integration between pipeline components with an in-house gRPC+ProtoBuf pipeline architecture in Python, built for LIMS/metadata integration from the ground-up.
  - Demonstrated experience using CS to meet business needs: Developed simple Python+R framework enabling non-CS teammates to deploy large-scale genomic analysis queries, without 'blocking on' the bottlenecked CS team.
  - Ensured rapid deployment in a fast-paced startup by collaborating directly with multidisciplinary SMEs and stakeholders to gather and interpret data pipeline requirements. Communicated with Bioinformatics expert for genomics tool selection.
- **Containerized Deployment & Autoscaling**
  Researched, containerized, documented, and deployed 10+ Computational Genomics tools to AWS ECS and EC2
  - Leveraged experience in Docker and Kubernetes to streamline & automate containerization workflow for Computational Genomics tools, turning user requests into production tools in as little as 6h.
  - Detected, diagnosed, and resolved compute resource inefficiencies. Ensured ECS and EC2 autoscaling optimized cluster efficiency and responsiveness.
- Led the CS team in adopting SDLC tools like Git, AWS CodeCommit, and Docker / AWS Elastic Container Registry. Championed utilization of Microsoft Teams Kanban tools for project&process management.
- Worked closely with SMEs to perform statistical analysis and visualization of microbial taxonomy data in Python+R.

Embedded Systems Engineer *at* Applied Separations
2019-01 - 2020-01

Custom C++ / Arduino pump control software for chromatography and analytical chemistry systems in C and C++

- Demonstrated knowledge of Computer Engineering to optimize hardware efficiency by developing simple heuristic scheduling algorithms & virtual threading to manage real-time (60Hz+) pump control, touch screen input, and data/control communication, all on a single Arduino Mega.
- Analyzed and validated stable delivery with a custom, high-performance smoothing algorithm for variable feedback delay.

SUMMARY

Recent CS Grad (WGU 2022) with industry experience during degree program. Expert in Python & TensorFlow since 2015/2017. Certified in data-driven integrations of business needs, software engineering, project management, and software development best practices. Excellent writing, speaking, presenting, and technical communication skills.

CONTACT

- fractalmachinist@gmail.com
- [+1 (509)438-8146](tel:+15094388146)
- https://fractalmachini.st
- https://linkedin.com/in/zachallen-fractalmachinist/
- Bethlehem, PA 18015

PROJECTS

Neural Cellular Segmentation *link*

Exploring neural cellular automata and attention (NCA+A) for medical image segmentation in TensorFlow

- Developed, tested, and iterated NCA+A models in TensorFlow, balancing system resources and model size to optimize GPU utilization.
- Created multiple tf.Data pipelines with preprocessing and data augmentation steps.

Interplan *link*

Task dependency management from a Graph Database

- Developed a Neo4j+JS dependency resolution and task status tracking API.
- Designed intuitive React app for displaying and interacting with tasks.
- Packaged Node+Neo4j in Docker & Kubernetes for easy migration.

Service Writer *at* Alpha Computer Center   *2017-12 - 2018-11*
Customer service, sales, and technician support
- Ensured customers were able to accurately understand and communicate with repair technicians, improving customer service and reducing diagnostic time.
- Leveraged extensive Linux experience to rapidly identify and repair issues that couldn't be fixed by Mac diagnostic tools.
- Reduced call frequency with an informative website. See it on web archive.

Machine Learning Researcher   *2017-01 - 2017-05*
at Pacific Northwest National Laboratory
ML Research and Data Engineering - Research Internship
- Researched, Designed and tested novel ML & Neural Network algorithms, architectures, and error formulations for NLP, image classification, and time-series data classification in Python+Tensorflow.
- Demonstrated increased test accuracy (15%   90% detection with higher Bayesian Confidence) on unbalanced (>1000:1) datasets for network insider threat detection, without duplication, augmentation, or batch filtering.
- Worked independently, balancing multiple projects and deliverables with minimal mentor supervision.

EDUCATION
Bachelor's in Computer Science   *2019-02 - 2022-08*
at Western Governors University
Focused on Machine Learning and Project Management in a fully remote environment
SUB-TASKS:

- Diamond Price Prediction Model *link*
  End-to-End ML Model development and documentation for a mock gemstone marketplace
  - Researched & analyzed opportunities to integrate Machine Learning with existing infrasructure, merging technical requirements and business needs.
  - Wrote & delivered project proposals, documentation, and performance reports, following best practices for technical and professional communication.
  - Rapidly prototyped Python data pipeline in Numpy/Pandas and ML model in SciPy, demonstrating project validity quickly at least expense.
  - Integrated report generation and documentation in a Jupyter Notebook, providing Seaborn data visualization and embedded interactivity.

- Advanced Java Concepts *link*
  Developed appointment scheduling and customer database tool in Java
  - Streamlined Model-View coupling by encapsulating MySQL/JDBC connection objects with data processing steps and Observable outputs in a shared wrapper class.
  - Paid technical debt by finalizing project documentation.

ACHIEVEMENTS:

- CompTIA Project+ *Issued by Pearson VUE Validate with Registration: 358639011 Validation: 155946649*   *2019-07*
  Demonstrated understanding of Project Management roles, processes, and documentation. Includes training in Agile.

- IT Information Library Foundations Certification (ITIL) *Issued by AXELOS*
  Demonstrated understanding of designing, deploying, maintaining, and retiring IT resources to support business needs.

- Site Development Associate *Issued by CIW*
  Demonstrated ability to design and build websites.

- Excellence Award for Communication Applications *link*

Do Robots Dream in Color *link*
Collaborative project simulating cellular automata in the browser
- Leveraged previous CUDA experience to accelarate simulations running on the WebGPU shader interface.

MarkNotes *link*
Intuitive journaling tool designed to encourage long-term review and introspection
- Integrated MongoDB and Node API for destructuring, storing, and querying Markdown entries as semi-structured data.
- Designed simple, intuitive React web app interface.
- Packaged Node+MongoDB in Docker & Kubernetes.

NetTimeLog
Minimalist, accurate time tracking
- Created time-tracking web app with Python+Flask which records what you just completed, so you never estimate what you will do or how long it will take.

SKILLS

AWS Tools
AWS · S3 · EC2 · ECS

Academic
Research · Computer Science · Experimentation · Research and Development · C · Running Experiments

Admin
Frameworks · Testing · Integration · Automation · Tooling · GitHub · Version Control · Continuous Integration · SDLC · Bash · Git · Software Development Processes · Build Tools · CI/CD · New Tools · Interoperation

Admin Cloud
Large Scale · Deployment · Kubernetes · Operations · Infrastructure · AWS · Docker · DevOps · Containerization · Cloud Computing · Cloud Services · Scalable Infrastructure

Bio
Genetics · Biology · Bioinformatics · Genomics

Code Data
Python · C · Implementation · Software Development · Software Engineering · Debugging · C++ · GPU Programming · Coding · Implement Solutions

Code Research
R · MATLAB · Jupyter · Jupyter Notebook

Communication
Communication Skills · Documentation · Technical Communication · Writing · Written Communication · Presentation Skills · Communicate Results · Technical Documentation · Technical Content · Technical Writing

Data Engineering
Data · Large Scale · Analysis · Data Science · Pipelines · Big Data · Data Engineering · Data Pipelines · Analytical Skills · Data Manipulation · Analytics Tools

Data Infrastructure
Data · Large Scale · Infrastructure · AWS · Data Science · Pipelines · Big Data · Data Engineering · Data Pipelines · Data Infrastructure · Data Architecture · Data Manipulation · Scalable Infrastructure

Data Visualization
R · Matplotlib · Data Visualization · Seaborn

Databases
Data · Data Science · SQL · Data Engineering · MySQL · NoSQL · MongoDB · Neo4j · Apache Tinkerpop · Data Manipulation

Efficiency
Optimization · High Performance · Resource Utilization

Embedded
Embedded Systems · Microcontrollers

Java
Java · JavaFX · JDBC

Ml
Machine Learning · Artificial Intelligence · TensorFlow · Deep Learning · Analysis · Algorithms · Statistics · Machine Learning Algorithms · Algebra · Neural Network Architectures · Analytical Skills · Linear Algebra · Bayesian Statistics · Convolutional Neural Networks · Analytics Tools · Matrix Algebra

Personality
Problem Solving · Data Driven · Multidisciplinary · Cross Functional · Solving Problems · Problem Solver

Project
Requirements · Management · Agile · Workflows · Stakeholder Support · Prototyping · SDLC · Scope · Business Needs · Project Management · Organizational Skills · Software Development Processes · Business Problems · Agile Teams · Technical Requirements · Business Requirements · Product Requirements · Rapid Prototyping · Managing Requirements · Agile Methodology

Python Tools
Python · SciPy · Matplotlib · Pandas

Remote Work
Remote Work · Fully Remote · Work Independently

Software Best Practices
Implementation · Software Development · Software Engineering · Documentation · Testing · Best Practices · Coding · Implement Solutions

Software Development
Computer Science · Implementation · Software Development · Software Engineering · Testing · Optimization · Debugging · Coding · Computer Engineering · High Performance · Prototyping · C · Implement Solutions · Rapid Prototyping · Resource Utilization

Software Planning
Algorithms · Computer Science · Implementation · Frameworks · Software Development · Software Engineering · Coding · Computer Engineering · API · API Design · OOP · C · Implement Solutions

Team Skills
Collaboration · Leadership · Ownership · Teamwork

Unix
Linux · GitHub · Version Control · Bash · Git · Unix

Webdev
JavaScript · HTML · CSS · Web Applications · React · Web Development · HTML5