

# ZACH ALLEN

He/Him

## IMPACT & EXPERIENCE

**Software 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, 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 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.

**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](#).

## SUMMARY

Machine Learning Researcher & Data Engineer with 5 years experience in collaborative AI innovation & infrastructure implementation at scale. Expert in Python & TensorFlow since 2015/2017. Passionate about working closely with multidisciplinary partners to shape the future towards global sustainability. Excellent writing, speaking, presenting, and technical communication skills.

## CONTACT

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## 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.
- 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.

Machine Learning Researcher (Intern)2017-01 - 2017-05

at Pacific Northwest National Laboratory

ML Research and Data Engineering

- Designed and tested novel Neural Network algorithms, architectures, and error formulations for NLP, image classification, and time-series data classification.
- 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 Science2019-02 - 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 infrastructure, 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](#)

MarkNotes [link](#)

Intuitive journaling tool designed to encourage long-term review and introspection

- Integrated MongoDB and Node API for deconstructing, 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.