

# ZACH ALLEN

He/Him

## IMPACT & EXPERIENCE

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

### Data Engineering supporting Bioinformatics Research

- **AWS Genomics Pipeline**  
Independently designed, implemented, and deployed Terabyte-scale AWS genomics pipeline in 4 months part time, from no prior genomics or AWS experience.
  - Designed, implemented, and documented gRPC+ProtoBuf pipeline architecture.
  - Accelerated research iteration with an in-house Python+R interface helping non-CS teammates deploy complex, multi-stage genomics queries without relying on the CS team.
  - Collaborated with SMEs to gather, interpret, and meet data pipeline requirements. Interfaced with Bioinformatics expert for genomics tool selection.
- **Containerized Deployment & Autoscaling**  
Researched, containerized, documented, and deployed 10+ Computational Genomics tools to AWS ECS and EC2.
  - Streamlined & automated containerization workflow for Computational Genomics tools.
  - Constructed and tuned EC2&ECS autoscaling, maximizing cost efficiency and cluster responsiveness.
  - Detected, diagnosed, and resolved compute resource inefficiencies.
- 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 analysis and visualization of microbial taxonomy data in R.

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

### Developed custom C++ / Arduino pump control software

- Designed and developed pump control software for chromatography and analytical chemistry systems in C and C++.
- Wrote a simple heuristic scheduler & virtual threading to manage real-time (60Hz+) pump control, touch screen input, and data/control communication, all on a single Arduino Mega.
- Designed and validated delivery prediction and smoothing algorithms for nonlinear feedback delay.
- Interfaced with separate development team in charge of chromatography control software. Collected and implemented requirements from instrumentation engineer.

## 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.

**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 (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, without duplication, augmentation, or batch filtering.
- Worked independently, balancing multiple projects and deliverables with minimal mentor supervision.

**EDUCATION**

**Bachelor's in Computer Science** at Western Governors University

2019-02 - 2022-08

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

**SUB-TASKS:**

- Diamond Price Prediction Model** [link](#)  
Proposed, implemented, and documented a diamond price prediction ML model
  - Demonstrated integration of project management and software engineering best practices.
  - Developed simple Data Pipeline in python/pandas.
  - Integrated code and report generation with a Jupyter Notebook.
- Advanced Java Concepts** [link](#)  
Developed appointment scheduling and customer database tool in Java
  - Encapsulated Observable state and database connection state into a shared wrapper class, streamlining inheritance, error handling, and UI/Database auto-updates.
  - 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.
- IT Information Library Foundations Certification (ITIL)** Issued by AXELOS  
Demonstrated understanding of designing, deploying, maintaining, and retiring IT resources.
- 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.