

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.
- Collaborated with SMEs to gather, interpret, and meet data pipeline requirements. Interfaced with Bioinformatics expert for genomics tool selection.

- 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.

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.

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.

- **Advanced Java Concepts** [link](#)

Developed appointment scheduling and customer database tool in Java

ACHIEVEMENTS:

- Excellence Award for Communication Applications [link](#)

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

fractalmachinist@gmail.com

+1 (509)438-8146

<https://fractalmachini.st>

<https://linkedin.com/in/zachallen-fractalmachinist/>

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.