Eli Fine
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# Professional Experience

**Principal Laboratory Automation Engineer** at Vivodyne (Philadelphia, PA – Remote) 01/2024–11/2024

- Architected and led the technical implementation of a robust software stack enabling execution of scientific workflows on a cutting-edge custom-built 3D cell culture automation workcell
- Partnered with scientists to gather requirements, prioritize feature development, and maintain a dynamic Agile backlog, ensuring alignment with R&D and client goals
- Built and deployed a cloud-first scalable architecture for fleet management of multiple workcells; containerized deployment managed by AWS Systems Manager for code executing on-prem, which communicated with a purpose-built high availability full stack (Flask/SQS/Lambda/Postgres) web application
- Designed a virtualized state representation for all devices and objects in the workcell, facilitating high-fidelity *in silico* simulations and ensuring robust Continuous Integration testing
- Leveraged Python, C#, gRPC, CAN bus, and TCP sockets to develop high-performance device drivers for complex instruments such as Zeiss LSM Confocal, Hamilton Zeus pipettes, KUKA robotic arm, PhoenixContact PLC, and Hiwin motion stage, enabling coordinated asynchronous operations.

**Director of Automation & Process Engineering** at Resilience (San Diego, CA – Remote) 04/2021–12/2023

- Built an Agile team of software and robotic engineers to architect and implement laboratory robotic and data automation solutions across the company (five sites in CA, FL, MA)
- Using tools including: cloud data analysis workflows, SDMS/ELN integrations, automated liquid handlers, robotic arms and peripherals, TekMatic MDM platforms,
- In biological areas such as: genome engineering (human and *E. coli*), cell line development, synthetic biology, analytical assays, cell-free protein synthesis, and downstream purification
- Across therapeutic classes: gene therapies, cell therapies, biologics, nucleic acids, vaccines
- Configured AWS Systems Manager and Git to automate deployment of software packages and robotics code across the fleet of laboratory PCs, additionally in FedRAMP environments using AWS GovCloud
- Created and open-sourced (link) a linting tool for static analysis of robot code to reduce programming errors

**Director of Lab Automation & Software Engineering** at Curi Bio (Seattle, WA – Remote) 04/2019–04/2021

- Built a full-stack Agile software team to develop desktop software controlling novel scientific instrumentation, and customer cloud analysis portals to perform large scale analyses on collected data, utilizing AWS, VueJS, Electron, and Python
- Conducted Voice of Customer interviews to gather details to prioritize software features and supported customer onboarding into the software suite.
- Designed laboratory automation solutions to accelerate internal R&D and sell to external customers
- Principal Investigator for NIH SBIR grant to investigate manufacturability of cryopreserved Assay Ready Plates of iPSC-CardioMyocytes (1R43HL154928-01)
- Subaward PI conducting AI analysis on data collected by HESI consortium for next gen drug safety screening

**Sr. Director of Lab Automation & Data Science** at Coyne Scientific (Atlanta, GA) 01/2017–01/2019

- Performed exploratory analyses uncovering relationships between genetics, transcriptome expression, and functional beating behavior of human heart cells in response to pharmaceutical therapeutic drugs
- Personally coded key components, analyses, and models of our data science stack while managing a small cross-functional team of junior researchers, lab technicians, software engineers, and external contractors
- Communicated scientific results to clients, executives, and investors; presented at national conferences
- Populated and analyzed a MySQL database of internal results containing tens of millions of data rows
- Created an end-to-end biological image analysis pipeline to extract and clean raw data into final results
- Designed, integrated and programmed a $1 million human iPSC culture & assay automated platform (link)

**Director of Genomics** at Coyne Scientific (Atlanta, GA) 07/2015–12/2016

- Coded a full stack from scratch of MySQL tables and a PyQt GUI to allow querying and visualizing our data

- Automated data visualization using matplotlib and LaTeX to create reports for clients and for internal use
- Interviewed and hired staff at levels from technician through PhD as the scientific team grew from 2 to 7

**Genomics Intern** at Expression Therapeutics (Tucker, GA) 06/2014–08/2014

- Prototyped and established a bioinformatics pipeline to identify lentiviral integration sites from NGS data

**Genomics & Gene Editing Consultant** (variety of start-ups and academic groups) 02/2014–Present

- Assisting patent & grant submissions, designing experiments, performing custom bioinformatics analyses

## Selected Technical Skills

- Bioinformatics analysis: NGS, DNA-seq, bowtie2, RASL-seq, STAR, Edena genome assembler, EMBOSS
- Sequencing Library prep: Illumina, PacBio (SMRT)
- Genome Editing: CRISPR target, donor, and assay design & NGS analysis of on- and off-target activity
- AWS Cloud: Pulumi IaC, RDS, S3, Lambda, SQS, ECR, AppStream, SSM Run/Distributor, EventBridge
- Python, SQL, Git, Agile practices, TDD, VueJS
- Machine learning classifier / regressor / cross validation, SageMaker Ground Truth
- DevOps: Pulumi Infrastructure as Code, Github / Gitlab / CodeBuild pipelines, Docker, Devcontainers
- Laboratory robotics: STAR, Lynx, Mantis, ASSIST Plus, Biomek 3k, LiCONiC, KX-2, a4s Sealer, X-Peel, Tekmatic MDM, ImageXpress, Cytation5, Neo2
- ELN/SDMS Integrations: Benchling, Quilt

## Education

**Ph.D. in Biomedical Engineering**, Georgia Institute of Technology & Emory University GPA: 4.0 2015

- Thesis: A Toolkit for Analysis of Gene Editing and Off-Target Effects of Engineered Nucleases
- Created a classifier using machine learning techniques to better predict potential nuclease off-target sites
- National Science Foundation Graduate Research Fellowship (Top 2000 STEM PhD students in USA)
- Georgia Institute of Technology President's Fellowship ($22,000)
- Mentored and trained 4 undergraduate students throughout 8 semesters

**Management of Technology Certificate**, Scheller College of Business (Georgia Tech) GPA: 4.0 2014

**B.S. in Biomedical Engineering** with Honors, Brown University GPA: 3.9 2010

- Halpin Prize for Innovative & Interdisciplinary Engineering Senior Capstone Design Project (Top 5%)
- Chapter President of Tau Beta Pi (Engineering Honor Society)

## Peer Reviewed Publications: 8100+ citations, H-Index: 13 (Google Scholar Hyperlink)

- 1st & co-1st author: *Cell Reports* (2014), *Nucleic Acids Research* (2013), *Trends in Biotechnology* (2015), *Scientific Reports* (2015), *International Journal of Nanomedicine* (2009)
- Co-author: *Nature Biotechnology* (2013), *Nucleic Acids Research* (2013, 2nd author), *Nucleic Acids Research* (2014, 2nd author), *Nucleic Acids Research* (2014), *Molecular Therapy Nucleic Acids* (2014), *Current Gene Therapy* (2014), *Scientific Reports* (2017), *Molecular Therapy Nucleic Acids* (2016), *Annals of Biomedical Engineering* (2014, review article, 2nd author)