

Dreycey Albin, PhD

ML Systems Engineer

📞 (+1) 720-448-9778 || 📩 dreyceyalbin@gmail.com || 🌐 Redmond, WA

👤 Dreycey || 🌐 dreyceyalbin.com || 📚 Google Scholar || 💬 LinkedIn

Professional Summary

ML engineer bridging research and production systems. I design and validate statistical/ML/deep learning models, build experimentation and evaluation frameworks, and ship low-latency, reliable inference and data pipelines. At Microsoft Azure, I work at the intersection of modeling and distributed services on Resource Central (core control-plane ML), serving all regions and processing 1M+ requests per day.

Technical Skills

Languages: Python, C++, C#, SQL (Postgres); Rust (research)

ML: PyTorch, TensorFlow, scikit-learn, NumPy; tabular + time-series + sequence modeling; uncertainty quantification; offline/online evaluation; model quantization; CUDA, DeepSpeed

MLOps: MLflow, Weights & Biases; CI/CD for ML; drift detection; experiment tracking; backtesting / walk-forward evaluation

Systems: Distributed systems, Kubernetes, Docker, Linux, Git; Azure/AWS; Spark/Dask; model serving/inference (ONNX, ONNX Runtime); observability/monitoring; SLOs and rollout guardrails

Work Experience

Microsoft Azure (Resource Central ML System)

Redmond, WA

Machine Learning Engineer (Level 62)

03/2025 – Present

- **Technical Lead, Capacity Mitigation System (\$100M/yr CapEx + Awards):** Architected a telemetry-driven capacity mitigation system and mentored one engineer through end-to-end implementation; reduced regional mitigation time from ~1 week to ~4 hours across 50+ regions and ~1M VMs/containers with zero customer impact. Earned org-wide Azure Core Impact and Builders Excellence awards.
- **Technical Lead, Heterogeneous Overprovisioning Engine (\$350M/yr projected):** Leading a 4-person cross-functional team (2 SWEs, 2 MLEs + research) to replace heuristics and LGBM with a low-latency multi-task deep neural network for resource-consumption prediction; designed architecture, feature engineering, and task-weighting scheme; built end-to-end Python/PyTorch training and evaluation pipelines including calibration, ablations, and offline-to-online validation; shipped control-plane integrations with monitoring and rollout guardrails under strict sub-50ms latency and SLO constraints.
- **Distributed Model Delivery & Serving Architecture (patent pending):** Designed a distributed model delivery and serving system across microservices with automated versioning, shadow/canary releases, and auto-promote/rollback guardrails; standardized production inference risk controls across the team.

Machine Learning Engineer, Level 61

07/2023 – 03/2025

- **Policy Changes (\$50M+/yr CapEx):** Led platform-wide decisioning policy changes and built the automated validation and reporting framework including forecasting, regression checks, drift monitoring, and decision stability analysis used by finance and senior leadership to track impact.
- **LightGBM Production Model Improvement:** Overhauled evaluation methodology with thresholding tradeoff analysis and backtesting across cohorts and edge cases; reduced false negatives by 5% while preserving safety constraints and unlocking additional capacity headroom.

Medtronic

Boulder, CO

Research Software Engineer (Contract)

09/2021 – 05/2022

- **Real-Time LSTM Catheter Pose Estimator (<20ms inference):** Developed LSTM model from fiber-optic sensor streams for real-time surgical catheter pose estimation; built evaluation harnesses covering latency/accuracy tradeoffs, edge deployment, and safety validation across operating conditions.
- **Autonomous Catheter Robot Production Stack:** Shipped full Python software stack for an autonomous catheter robot including real-time control, telemetry, and failure-safe behaviors; system passed regulatory-readiness review.

Internships

Microsoft Azure | Data Scientist Intern

06/2022 – 08/2022

- Analyzed spot-VM uptime/evictions and identified key drivers to inform scheduling policy tuning at global fleet scale.

Inscripta (Genome Engineering) | Computational Biologist Intern

06/2021 – 08/2021

- Built a modular Python CLI pipeline for graph-genome edit detection; benchmarked alignments vs conventional tools (e.g., Bowtie) and documented accuracy/performance tradeoffs.

OwlSpark Accelerator, Rice University

Houston, TX

Co-founder

Summer 2020

- One of three co-founders in Rice University's startup accelerator; developed go-to-market strategy, conducted customer discovery interviews, and pitched to venture capitalists; built foundations in product prototyping, branding, and entrepreneurial decision-making.

Education

Ph.D. Computer Science University of Colorado Boulder NSF GRFP Fellow	2020 – 2023
• Dissertation: <i>Automating phage discovery using novel software & high-throughput tools</i>	
• Advisor: Dr. Mirela Alistar	
M.Sc. Systems, Synthetic & Physical Biology (SSPB) Rice University	2018 – 2020
• Thesis: <i>Platform for sensitive, efficient nucleic acid screening</i>	
• Advisor: Dr. Todd Treangen	
NIH-PREP Postbaccalaureate University of Washington	2017 – 2018
• Project: <i>Computational modeling of the 3D structure of Cyrano</i>	
• Advisor: Dr. Gabriele Varani	
B.S. Chemistry + B.S. Biology University of Northern Colorado McNair Scholar	2012 – 2017
• Thesis: <i>Immunohistochemistry of FP Receptors in the Bovine Corpus Luteum</i>	
• Advisors: Dr. James Haughian, Dr. Patrick Burns	

Selected Open Source Projects

- S1 **PhageScanner** — Reconfigurable ML framework (9 model backends) for bacteriophage genomic and metagenomic feature annotation; modular pipeline supporting custom model integration and a GUI for visual genome browsing. Published in *Frontiers in Microbiology*, 2024.
- S2 **PhageBox** — Open-source digital microfluidics extension integrating real-time ML inference, embedded hardware control (temperature $\pm 0.2^\circ\text{C}$, electromagnetics), and a GUI-driven bio-protocol programming model. Published in *IEEE Transactions on Biomedical Engineering*, 2023.

Selected Publications

- P1 **PhageScanner: a reconfigurable machine learning framework for bacteriophage genomic and metagenomic feature annotation** - (*Frontiers in Microbiology*, 2024) - D. Albin, M. Ramsahoye, E. Kochavi, M. Alistar
- P2 **PhageBox: an open source digital microfluidic extension with applications for phage discovery** - (*IEEE Transactions on Biomedical Engineering*, 2023) - D. Albin, L. Buecherl, E. Kochavi, et al.
- P3 **Hidden genomic diversity of SARS-CoV-2: implications for qRT-PCR diagnostics and transmission** - (*bioRxiv / Europe PMC*, 2021) - N. Sapoval, ..., D. Albin, ..., T.J. Treangen
- P4 **Methods developed during the first NCBI Structural Variation Codeathon at Baylor College of Medicine** - (*F1000*, 2021) - M. Mahmoud, ..., D. Albin, ..., F.J. Sedlazeck, B. Busby
- P5 **Structure of the RNA specialized translation initiation element that recruits eIF3 to the 5'-UTR of c-Jun** - (*Journal of Molecular Biology*, 2020) - M.J. Walker, ..., D.D. Albin, ..., G. Varani
- P6 **An evolutionarily-conserved RNA structure in the functional core of the long non-coding RNA Cyrano** - (*RNA*, 2020) - A. Jones, G. Pisignano, T. Pavelitz, ..., D. Albin, G. Varani
- P7 **SeqScreen: a biocuration platform for robust taxonomic and biological process characterization of nucleic acid sequences of interest** - (*IEEE BIBM*, 2019) - D. Albin, D. Nasko, R.A.L. Elworth, et al.

Awards and Honors

Microsoft Azure Builders Excellence Award	2025
NSF Graduate Research Fellowship (GRFP)	2018 – 2022
Dissertation Completion Fellowship (Link)	2023
Outstanding Service Award, CU Boulder CS Dept. (Link)	2023
Helmsley Scholarship, Cold Spring Harbor Synthetic Biology Course (Link)	2018
The Dean's Prize (\$10,000) <i>Rice University</i>	2018
ABRCMS ABRF Best Poster Award	2017
FASEB DREAM Mentored Travel Award	2017
Undergraduate Academic Scholar Award <i>University of Northern Colorado, Dept. of Chemistry</i>	2017