Dreycey Albin, PhD

Machine Learning Engineer

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Professional Summary

ML engineer focused on bridging research and production systems. I design ML Systems, deep learning architectures, build rigorous experimentation and evaluation frameworks, and ship low-latency decisioning infrastructure under strict reliability constraints. At Microsoft Azure, I serve as technical lead for modeling in the core Azure control-plane ML system, Resource Central, serving all regions and processing over 1M requests daily.

Technical Skills

ML: PyTorch, TensorFlow, scikit-learn, NumPy; tabular + time-series + sequence modeling; uncertainty quantification; model quantization; CUDA, DeepSpeed, Computer Vision
MLOps: MLflow, Weights & Biases; CI/CD for ML; AutoML; drift detection; experiment tracking; backtesting
Systems: Distributed systems, Kubernetes, Docker, Linux, Git; Azure/AWS; Spark; model serving/inference (ONNX, etc);
Languages: Python; C++, C#; Rust; SQL (Postgres)

Work Experience

Microsoft Azure — **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)**: Led 4-person cross-functional team replacing heuristics/LGBM with a low-latency multi-task DNN for resource-consumption prediction; owned architecture, feature engineering, and metrics; built end-to-end PyTorch training/eval pipelines (calibration, ablations, offline-to-online validation); shipped distributed control-plane integrations with monitoring and rollout guardrails under sub-50ms 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.

Education

Ph.D. Computer Science | *University of Colorado Boulder* | NSF GRFP Fellow — 2020 – 2023
M.Sc. Computational Biology (SSPB) | *Rice University* — 2018 – 2020
NIH-PREP Postbaccalaureate | *University of Washington* — 2017 – 2018
B.S. Chemistry + B.S. Biology | *University of Northern Colorado* | McNair Scholar — 2012 – 2017

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 **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

Azure Core Impact Award — 2025
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