NealDawson-Elli

Chemical Engineer - Data Scientist - Machine Learning Engineer

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Skills

Machine Learning Engineering
- Docker, Kubernetes, FastAPI, Serverless Architecture, Spark, SQL, Cython, AWS Cloud Architecture
- ML Training Automation, ETL Pipelines, High-Performance APIs, Data Visualization, Active Learning

Data Science
- Python, Analysis Stack (NumPy, SciPy, Pandas, Sci-Kit Learn), PyTorch, Plotly Dash
- Machine Learning (LLMs, Reinforcement Learning, Convolutional NNs, Random Forests)

Education

2019 **Ph.D. in Chemical Engineering** — Univ. of Washington, Seattle, WA
- Option in Advanced Data Science

2015 **B.S. in Chemical Engineering** — Rochester Inst. of Tech., Rochester, NY
- Minor in Musical Performance

Experience

Current **Machine Learning Team Lead** — Nanoramic, Boston, MA
- Created Cellficient AI, a software platform for advanced analytics and Machine Learning
- Developed an AI-Guided Experiment Planning tool suite coupled with Cost and Multiphysics Models
- Architected an event-driven ETL pipeline for electrochemical timeseries analysis and management

2021 **Data Engineer** — PayScale, Seattle, WA
- Crafted high-performance ETL systems for Snowflake Snowpipe ingestion
- Developed and deployed multiple high-throughput MicroServices on AKS using Python and C#
- Productionized Data Science services, improving performance and repeatability while reducing cost

Projects

2023 **Cellficient AI**
- A full-stack, serverless Analytics Engine for Li-Ion battery experiment planning and analysis
- Eliminated external software, delivering 95% cost savings and 98% analysis time savings
- Developed AI-Guided experiment planning and data-driven result forecasting algorithms

2019 **Physics-Guided Neural Networks**
- Generated Ensembled Neural Networks that can accurately represent internal battery states
- Deployed feedforward Neural Networks with Numpy for 5x speed improvement
- Significantly increased timeseries forecasting stability with physics-guided loss function

2019 **What Can Electrochemistry Learn from Chess?**
- Li-Ion battery cycle life can be extended 2x by model-predictive control, but calibration is very difficult
- Architected neural-network-based multi-objective optimization framework using 200,000 time-series simulations to efficiently calibrate expensive nonlinear models using Keras and Tensorflow
- Reduced in-house Li-Ion model calibration time by 60% and improved fit by 30x over Genetic Algorithm