Bryan P. Dannowitz

Data Scientist, Physics PhD, Generalist

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TL;DR

From high-energy particle physics to crop science to medical claims analysis – in seeking out a varied array of endeavors, I have been enabled to develop a contrasting yet complementary set of skills. Being allowed to invent and design clean and effective predictive modeling solutions to the toughest problems is what motivates me. The more challenging, valuable, and interesting the task, the better.

Experience

2019 – Pres. **Centene Corporation**, *Data Scientist III*.

- Clayton, MO
  - Project: Architected a scalable framework for applying an arbitrary number of pre-pay claim edits. Designed, tested, and deployed quickly to provide immediate financial business impact. New edits added every month.
  - Project: Designed an event-based model framework for intelligently re-prioritizing claim adjudication for interest charge avoidance. Binary classification with high-cardinality features on significantly imbalanced data.
  - Refactored sprawling legacy code into a modular, tested framework – while it was deployed and in operation.
  - Created a pure Python rules engine for quickly applying arbitrarily complex logic on a large set of claims.
  - Developed a Python package for translating ICD-10 diagnosis codes into model-ready numeric features.
- Python, Jupyter, Git, Scikit-Learn, Docker, CI/CD, Bash, Oracle, MongoDB

2016 – 2019 **Bayer Crop Sciences**, *Data Scientist*.

- Creve Couer, MO
  - Project: Geospatial regionalization of agricultural markets, utilizing GIS algorithms, graph analytics, and unsupervised clustering methods. These regions are currently deployed and utilized at the core of the business.
  - Project: Agricultural pest modeling, utilizing time-series environmental data from disparate sources. Constructed a unified modeling pipeline for regression and classification pest predictions.
  - Project: Individually managed an intern on Service Ticket classification. NLP, imbalanced, 100+ classes.
  - Co-authored a unified Data Science Best Practices policy, along with rollout and training plan. Adherence bolsters the integrity and stability of data products. Conducted company-wide hackathons.
- Python, Jupyter, Scikit-Learn, Keras, Git, Docker

2009 – 2016 **SeaQuest Experiment**, *Research Assistant*.

- *Fermi National Accelerator Laboratory*, Batavia, IL
- *University of Illinois at Urbana-Champaign*, Urbana, IL
  - Trained a classification model to predict target position based only on radiation sensor data.
  - Implemented a responsive *Flask*-powered Python web front-end for live experimental visualizations.
  - Developed Python ETL framework for the retrieval, cleaning, merging, and analysis of data.
  - Thesis analysis provided the first significant measurement of an outstanding physical mystery since 1993.
- Python, Git, Bash, C, SVN, LaTeX

Skills

- **Machine Learning Principles:** Choosing the right metric for evaluation. Deliberate data partitioning and model validation. Model selection, model tuning, understanding when more data will/won't help. Creating a unified pipeline to process expected inputs. Model health monitoring practices, covariate drift detection.
- **Deep Learning:** Knowing if, how, and when to apply dense, convolutional, and/or sequential models to the problem at hand. How to take advantage of pre-trained models for similar tasks.
- **Software Best Practices:** Consistent, modular, linted code. Thorough self- and external documentation. Versioned with a deliberate branching strategy. Thoughtful and consistent unit-testing and code review.

Education

2009 – 2016 **Ph.D. in Experimental Physics**, *UIUC*, Urbana, IL.

DISSERTATION *Nuclear dependence of proton-induced Drell-Yan dimuon production at 120GeV at SeaQuest*

2004 – 2008 **B.S. in Physics**, *New Mexico Institute of Mining and Technology*, Socorro, NM.