Bryan P. Dannowitz

Data Scientist, Physics PhD, Generalist

4225 Hartford Street
Saint Louis, MO 63116
☎ 708.400.9291
✉ bryan.dannowitz@gmail.com
in dannowitz

TL;DR

I have a track record of working on challenging problems in the fields of particle physics and predictive modeling. In seeking out a varied set of projects, I have been able to develop disparate, yet complementary skill sets. Inventiveness and intellectual freedom motivate me, and I have only ever experienced this in the wake of truly difficult problems. As an employee, I use this motivation to actively prospect for such problems and deliver creative, effective solutions in close collaboration with my peers.

Experience

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

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 and user-submitted data from disparate sources. Constructed a unified modeling pipeline for regression and classification pest predictions. Projected increase of realized revenue of $5M+
- Project: Individually managed an intern on an NLP, sequence modeling, imbalanced classification problem with 100+ classes. Now in proof-of-concept evaluation for internal usage, potentially saving ∼1000 man-hours.
- Collaborated across departments to author a unified Data Science Best Practices policy, along with rollout and training plan. Adherence bolsters the integrity and stability of data products, company-wide.
- Curated a set of viable data science projects from across the business and led a company-wide, two-day Hackathon. Several projects went on to impact the business, with one currently in production.
- Evaluated new data science platforms and compiled reports to inform leadership's decisions.

Tools → Python, Jupyter, Scikit-Learn, Keras, Git, Docker

2016 – Pres. **Bayer Crop Sciences (formerly Monsanto Company)**, *Data Scientist*.

Creve Couer, Mo

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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 identify systematic unknowns for periods with malfunctioning sensors. This salvaged a week's worth of valuable data taking, equivalent to $75k.
- Designed and implemented a MySQL RDBMS structure for data processing, storage, and analysis.
- 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.
- My analysis provided the first significant measurement of an outstanding physical phenomenon since 1993.

Tools → Python, C, Git, Bash, SVN, LaTeX

Skills

- **Machine Learning Principles:** Choosing the right metric for evaluation, data partitioning, and validation. Model selection, model tuning, understanding when more data will/won't help. Creating a unified pipeline to process expected inputs. Integrating covariate drift detection into pipelines to avoid out-of-domain predictions.
- **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. Extracting bottleneck features from trained networks as a form of dimensionality reduction.
- **Software Best Practices:** Consistent and linted code, with self- and external documentation, frequently versioned with a deliberate branching strategy, thoughtfully unit-tested, and code/model reviewed.

Education

2009 – 2016 **Ph.D. in Experimental Medium-Energy Particle 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.