Daniel C. Elton, Ph.D.

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Data Scientist

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Overview and Objective

I have six years of experience in AI/ML for medical imaging, including three years at Mass General Brigham, where I was involved in commercial projects. I am now seeking a rewarding job where I will be able to contribute to projects that have real-world impact. I am hard working, dependable, and a quick learner. In addition to my coding skills I am very good at writing, communication, and time management.

Computer skills

- My primary programming language is **Python**.
- I have a lot of recent experience with **SQL** and I have past experience with **Fortran**, **Matlab**, **Mathematica**, and **C++**.
- Python libraries: **pytorch**, **scikit-learn**, **pandas**, **numpy**, **scipy**, **matplotlib**, **keras**
- Extensive knowledge of: **git, Docker, GNU/Linux, HPC, Slurm, bash, LaTeX, DICOM, OMOP**

Work Experience

Staff Scientist **10/20/2024 — present**
National Institutes of Health *Bethesda, MD*

- Developed a transformer model for the prediction of future disease risk using electronic health records (EHRs).
- Helped plan a data science challenge which would involve using EHR, genetics, wearable, and survey data in the *All of Us* biobank to predict the onset of future disease phenotypes.

Translational Data Scientist **07/21/2021 — 10/7/2024**
Mass General Brigham *Somerville, MA*

- Took multiple AI/ML systems from research labs and deployed them for testing and validation in the radiology clinic, working closely with researchers, clinicians, engineers, and industry partners.
- Developed machine learning models for segmentation, classification, and anomaly detection.
- Deployed a suite of segmentation algorithms for opportunistic biomarker extraction and ran it on over 250,000 CT scans.
- Helped develop a no-code machine learning framework that allows radiologists to train their own models.
- Helped develop, test, and deploy a model that detects urgent anomalies in head CT, including the use of a conformal prediction method for statistical guarantees on performance.
- Created DICOM and FHIR outputs for the visualization and reporting of results. Designed and set up DICOM routing rules.

Staff Scientist (Kelly Government Solutions Contractor) **01/14/2019 — 07/16/2021**
National Institutes of Health *Bethesda, MD*

- Worked on deep learning-based algorithms that extract biomarkers from CT scans for disease risk prediction. The OSCAR biomarker suite includes segmentation and measurement algorithms for aortic plaque, visceral/subcutaneous fat, bone mineral density, muscle, and liver fat.
- Developed a state-of-the-art deep learning based system for kidney stone detection and size quantification on CT scans.
- Developed a patch-based 3D U-Net model for segmentation of plaque in the aorta and pelvic arteries. The system produced plaque scores that correlated well with manual measurements ($r^2 = 0.94$) on a large external test set.
- Developed a state-of-the-art model for pancreas segmentation on non-contrast CT using active learning. Ran the model on over $20,000$ scans from 9,000 patients to correlate pancreas features with diabetes diagnosis.
- Constructed a dataset of about 20,000 MRI scans and performed registration of MRI sequences.
- Made improvements to C++ codes for automated bone mineral density measurement, fat measurement, and fracture detection.
- Used the CycleGAN and UNIT image translation models for synthetic data augmentation.
- Performed GPU server installation, maintenance, and backups.
- Supervised and mentored a post-baccalaureate fellow and three summer interns.

Postdoctoral Researcher **06/01/2017 — 01/04/2019**
University of Maryland *College Park, MD*

- Applied machine learning techniques to predict the properties of molecules, and used natural language processing techniques to find associations between concepts in the scientific literature. Compared PCA, ICA, and IVA for dimensionality reduction.
- Wrote a review on deep generative modeling for molecular discovery, and co-authored seven peer-reviewed papers total.

Graduate Research Assistant **05/07/2012 — 12/15/2016**
Stony Brook University *Stony Brook, NY*

- Wrote a Fortran code (*PIMD-F90*) for simulating nuclear quantum effects in liquid water, and a Python package (*spectrumfitter*) for fitting dielectric spectra, including novel techniques. Published four papers in peer-reviewed journals.

Education

Doctor of Philosophy in Physics, *Stony Brook University*, Stony Brook, NY — Dec. 2016
Bachelor of Science in Physics, *Rensselaer Polytechnic Institute*, Troy, NY — May 2010