

Taylor Brunton Smith, PhD

DATA SCIENTIST | MEDICAL PHYSICIST

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Professional Experience

United States Cold Storage

Camden, NJ

DATA SCIENTIST: (PYTHON, SQL, AZURE, SNOWFLAKE)

Oct 2023-Present

- Conceptualized, built, and implemented models to meet USCS's automation needs
 - Developed a model to identify errors in customer EDI to avoid supply chain disruptions before they occur
 - Model reduces required human pallet inspection labor cost by 94% while maintaining 97% sensitivity
- Led research and development and created proof-of-concepts of Data Science, Machine Learning, and AI solutions to enhance operational efficiency and address business problems
 - Developed a consolidation engine to suggest minimal-effort maximum-results inventory consolidation to increase automation throughput and avert manual picking
 - Developed an application which uses Machine Learning to identify duplicated consignee records in master data management system to reduce shipping waste and avert transportation management system errors
- Acted as an analytical resource to internal customers to guide data-driven decision making in product development and project management
 - Conducted natural language processing and topic analysis on customer success representative emails to identify common customer requests, guiding the development of the Customer Portal
 - Provided internal analysis of vendor claims to inform pilot projects for energy-saving solutions

Imalogix

Bryn Mawr, PA

PRINCIPAL DATA SCIENTIST: (PYTHON, SQL, BASH)

Apr 2021 - Oct 2023

- Conceptualized, built, and implemented models using Python to meet Imalogix's automation needs
 - Developed lightweight, fast image classification methodology for sorting diagnostic and non-diagnostic images to speed up processing time
- Developed practical, data-driven tools and visualizations that help customers generate insights into their current practice, and identify strategic areas for improvement
 - Improved relevance of insight suggestion for Imalogix Spark Fluoroscopy users (76% of customers)
 - Designed and improved data visualizations for 2 key pages
- Spearheaded key efforts in Research and Development for Machine Learning and Data Science applications, and Medical Physics to improve product
 - Developed fast and accurate application for assessing and recording Daily Quality Control scan results in CT imaging
 - Consulted and advised on automated scan protocol classification strategy to improve accuracy in protocol mappings
- Conceptualized, developed, and implemented 2 new packages of product functionality
- Led annual product strategy meetings with Advisory Board to identify new opportunities for product and business growth
- Supported 2 external academic research partnerships culminating in peer-reviewed publications

Duke University - Carl E. Ravin Advanced Imaging Labs

Durham, NC

GRADUATE RESEARCH FELLOW: (MATLAB, PYTHON, BASH)

Aug 2015 - Dec 2020

- Developed metrics and key performance indicators (KPIs) to measure and track the quality of clinical CT scans. My developed methodology provides radiologists with an objective, quantitative way to measure quality in CT scans, and automatically identify poor quality scans which may be detrimental to diagnosis
 - Findings implemented into an image quality monitoring system for all clinical CT scans at Duke University Medical Center
- Developed a novel patient-specific methodology for measuring:
 - noise texture in CT examinations: [Link to talk \(Presented at the International Society for Optics and Photonics \(SPIE\) 2020\)](#).
 - low-contrast resolution in CT examinations
 - detectability index for liver lesions in CT examinations: [Link to paper \(Published in *Journal of Medical Imaging* in 2017\)](#).
- Used statistical modeling to demonstrate benefits of using novel developed methodology over current state-of-practice methodology

European Organization for Nuclear Research (CERN)

Geneva, Switzerland

CERN SUMMER STUDENT

June 2014 - Aug 2014

- Selected as one of 13 American students to participate in an international research experience for undergraduate program at the LHC in Geneva
- Conducted research for the improvement of the electromagnetic calorimetry detectors of the Compact Muon Solenoid (CMS) experiment of the Large Hadron Collider
- Estimated the time resolution of LYSO scintillator material using experimental data

Education

Duke University

Durham, NC

DOCTOR OF PHILOSOPHY IN MEDICAL PHYSICS, GPA: 3.73

Dec 2020

- Dissertation Title: “**Development and application of patient-informed metrics of image quality in CT**” — Advisor: *Ehsan Samei*

CERTIFICATE IN COLLEGE TEACHING

Dec 2020

- Related Courses: *College Teaching and Visual Communication, Diverse Learners and Contentious Issues*

Rutgers University

New Brunswick, NJ

BACHELOR OF SCIENCE IN PHYSICS, GPA: 3.89, *Summa Cum Laude*

May 2015

Minor in Mathematics

Skills

Languages Python, scipy, scikit-learn, numpy, seaborn, matplotlib, pandas, SQL, Matlab

Frameworks Bash, Docker, Git, Jupyter Notebooks, Tableau

Proficiency in Experimentation, Statistical modeling, Linear algebra, Multivariate Calculus, Probability, Machine Learning Models, Machine Learning Techniques, Identifying algorithms, Data wrangling, Data analytics, Interpreting Data, Data science tools, DICOM data, Medical imaging, CT imaging

Leadership skills Public speaking, conveying technical information to non-technical people, mentorship, time management, collaboration, critical thinking

Involvement and Leadership

Duke University

Medical Physics Graduate Program

TEACHING ASSISTANT: GRADUATE-LEVEL RADIATION PHYSICS

Fall 2016 and Fall 2019

- First resource for assistance to 15+ students for Radiation Physics examination preparation, weekly office hours, recitations and review. Spent 15-20 hours weekly assisting students. Lead one lecture in lieu of the professor, as principal instructor.
- 2-time finalist for “Teaching Assistant of the Year”

Hillandale Elementary School

Durham, NC

ANNUAL SCIENCE DAY COORDINATOR

Mar 2016 - Mar 2020

- Manage team of 10 volunteers yearly to plan, orchestrate, and execute Science Day for all 3rd grade classes at Hillandale elementary school
- Inspire 90, 3rd grade students annually at a local elementary school to be interested in Physics through demonstrations on motion, forces, and simple machines

Awards and Honors

Duke University Medical Physics Graduate Program, **Director’s Award For Exemplary Service**, “For serving the Medical Physics Program and fellow students, and for being an outstanding ambassador for the Program and Duke University” 2017

MedInt Holdings LLC, **Imalogix Research Fellowship**, To further advance the study of patient-informed metrics of image quality for monitoring 2016 - 2020

Duke University Graduate School, **James B. Duke Fellowship**, “Offered to help attract and develop outstanding scholars at Duke” 2015 - 2020

Rutgers University, **Phi Beta Kappa Society**, “To recognize the exceptional achievement of writers and scholars in the humanities, social sciences, natural sciences, and mathematics” 2014

Rutgers University Physics Department, **Robert L. Sells Physics Scholarship**, “Awarded annually to two Rutgers physics majors who, in the judgment of the physics faculty, have demonstrated outstanding academic excellence” 2014

Rutgers University Physics Department, **Herman Y. Carr Physics Scholarship**, “Awarded annually to two Rutgers physics majors who, in the judgment of the physics faculty, have demonstrated outstanding academic excellence” 2013

Rutgers University, **Presidential Scholarship**, Merit-based, covers tuition, room and board at Rutgers University for four years 2011

Selected Presentations and Publications

Orally presented results and findings for CT Image Quality Studies/Research on 3 occasions, including:

- In vivo noise texture estimation: development and validation of an automated methodology, SPIE Medical Imaging (Feb 2020, Houston, TX)

Published 11 peer reviewed articles across 6 reputable medical journals (with 6 as first author), including:

- Estimating detectability index in vivo: development and validation of an automated methodology
Journal of Medical Imaging (2017)
- Local complexity metrics to quantify the effect of anatomical noise on detectability of lung nodules in chest CT imaging
Journal of Medical Imaging (2018)