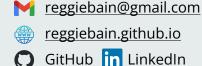
Reginald Bain, Ph.D.

Physics PhD | Data Science | AI/ML Engineering | Research + Education



EDUCATION

Duke University

Ph. D., Physics | 2017

University of South Carolina

B.S., Physics & Mathematics, summa cum laude | 2012

TECHNICAL SKILLS

Programming - Python, Pandas, Scikit-learn, Keras, TensorFlow, LangChain, Streamlit, Selenium, PyTorch, PySpark, SQL, Git, Bash, <u>Tableau</u>, AWS, MLOps, Apache Airflow, APIs, Docker, XGBoost

Other Skills - Data Science, Machine Learning, Deep Learning, Statistics, NLP, Data Visualization, Time Series, RAG, LLMs, Computer Vision, ETL, Data Analytics, Data Engineering, CI/CD

SKILLS & CERTIFICATIONS

The Erdos Institute (Ohio State) - Intensive Data Science Bootcamp - Top Project Award, <u>Deep Learning</u> <u>Bootcamp</u> - Top Project Award

Coursera - <u>Data Engineering</u>
Specialization, <u>Deep Learning</u>
Specialization, <u>Machine Learning</u>,
<u>TensorFlow Developer Specialization</u>,
<u>Google Project Management</u>
<u>Certificate</u>

HackerRank - <u>Advanced SQL</u> <u>Certification</u>, <u>Python Certification</u>

HONORS & AWARDS

NSF Graduate Research Fellow Barry M. Goldwater Scholar Phi Beta Kappa Mary Creason Memorial Teaching Award (Duke)

Nina and Frank Avignone Physics Award (UofSC)

PROFESSIONAL EXPERIENCE

Physics Instructor | SC Governor's School for Science & Math | 2019 - Present

- Designed 6+ college-level physics courses/labs, leveraged contemporary education research, emphasized data analysis skills
- Served as faculty senate officer for 4+ years. Devised and implemented new policies on curriculum, academic integrity, and faculty policies.
- Mentored dozens of students on communicating scientific research. Designed independent study on mathematical physics.

Data Science Project Mentor | The Erdos Institute | 2025-Present

- Mentored numerous data science projects for data science bootcamp. Provided project plans, delegated tasks, and set internal deadlines for group members.
- Advised groups on statistics, data science/ML/AI best practices, and programming/MLOps skills. <u>Certification link here</u>.

Instructional Assistant Prof. of Physics | U. of Houston | 2017 - 2019

- Taught 12+ large-enrollment introductory physics courses each with 300+ students. Supervised dozens of undergraduate and graduate TAs through courses and a drop-in tutoring center.
- Piloted innovative inquiry-based course in UH Active Learning Classroom facility.
 Designed innovative online materials.

RESEARCH EXPERIENCE

NSF Graduate Research Fellow | Duke University | 2012-2017

- Improved industry standard approach to modeling quark interactions using theoretical and ML/Al approaches. Leveraged programming, mathematics, large simulated data sets, numerical methods, and data visualizations.
- Published 3 papers, including one in the top physics journal, Physical Review Letters. Presented research at 6+ conferences in the US and abroad.
 Collaborated across multiple universities/national labs.

Undergraduate Researcher | U. of South Carolina | 2008-2011

- Implemented machine learning/AI algorithms and Monte Carlo simulations of particle collisions to develop techniques to help identify theorized new particles.
- Presented at 2 national conferences and won 2 national awards, Goldwater Scholarship and NSF GRFP.

DATA SCIENCE PROJECTS

<u>Predicting Football Wins</u> Leveraged APIs/web scraping and compared regression models to predict wins/identify key features. Beat naive forecast by 40+ %. Deployed model via StreamLit. Received *Top Project* award from Erdos Institute.

<u>Course Assistant Bots</u> — Built 2 NLP-based course assistant tools: <u>Syllabus</u> <u>Analyzer</u> and <u>Course Review Analyzer</u>. Leverage RAG pipeline via LangChain that assesses course syllabi usingLLMs. Made pipelines for identifying meaningless course reviews and predicting review sentiment. Deployed both via StreamLit.

<u>Song Similarity Detector</u> Built in PyTorch, that beats naive baseline by 80+% using 128-dim embeddings of songs. Explored CNN, fine-tuned pre-trained architectures such as ResNet-18/transformers. Leveraged various APIs and open source processed audio. Received *Top Project* award from Erdos Institute.