JACOB RENN

jacobrenn.github.io ◇ github.com/jacobrenn ◇ linkedin.com/in/jacobrenn-aisquared
1261 Pekin Road ◇ Pasadena, MD 21122
(301) 514-5057 ◇ jacob.renn4@gmail.com

OBJECTIVE

Accomplished data science leader, researcher, and startup co-founder with a proven track record of researching, building, and deploying cutting-edge AI solutions and technologies. Seeking a strategic role where I can leverage my expertise to drive innovation, lead strong technical teams, and advance AI research in high-impact areas.

SECURITY CLEARANCE

Top Secret/SCI with Full-Scope Polygraph

EXPERIENCE

Chief Data Scientist, AI Squared, Inc. (Co-Founder) *September 2020 - Present*

- Co-founded and scaled a company focused on solving the "last mile of machine learning," growing it to an over $60MM valuation and over $10MM in total revenue.
- Led the design and building of the company's browser-based AI integration technology stack, including an open source Python SDK and additional technologies.
- Performed extensive research and development focused on building custom LLMs, including fine-tuning for chat-based, agentic, and chain-of-thought behaviors.
- Created the BeyondML project based on fundamental research conducted to enable a single neural network architecture to perform multiple tasks by isolating network weights for use on individual tasks. BeyondML was contributed to the Linux Foundation Data and AI.
- Built and deployed ML models for various use cases as proof-of-concepts as well as for deployment to production. This includes traditional, predictive models as well as generative models and agents.
- Established enterprise and government partnerships, driving adoption of AI solutions across financial services, cybersecurity, entertainment, and supply chain sectors.
- Delivered technology demos, technical workshops, and spoke at conferences on a wide variety of topics related to the importance of integrating machine learning into business workflows, trends and predictions on the direction of AI, and building generative models.

Adjunct Faculty, Capitol Technology University *May 2022 - Present*

- Mentored PhD students conducting research on generative AI, transformer models, and the applications of ML in agriculture.
- Served as an external examiner for dissertation defenses, ensuring research rigor and academic contributions.
- Taught *CS-150: Programming in C*, achieving an overall student rating of 4.6/5.

Delivery Data Scientist, Microsoft Corporation *May 2020 - November 2021*

- Acted as the sole data scientist for Microsoft's Intelligence Community clients, advancing cloud adoption and AI innovation.
- Created and deployed machine learning models for government proof-of-concept tools, enabling advanced analytics and decision-making.
- Supported contract bids by assessing requirements and proposing technical solutions for federal agencies.
- Collaborated with teams to modernize system architecture, improving data processing efficiency for key systems providing enterprise-wide data processing capabilities.

Data Scientist, WaveStrike, LLC *June 2019 - April 2020*

- Developed multipurpose software for text analytics, enabling high-speed data processing and ML experimentation and evaluation.
- Improved neural network performance on few-shot classification tasks, leveraging HPC environments for training and fine-tuning transformer-based models such as BERT and RoBERTa.
- Partnered with leadership to expand operations, submitting proposals to NSF and DoD for interpretable AI technologies.

Data Scientist, United States Department of Defense *July 2018 - June 2019*

- Developed and deployed a document-matching tool using enterprise data repositories and latent semantic indexing to enable analysts to match documented information needs to draft reports.
- Researched and applied natural language processing techniques for topic modeling and document similarity analysis.
- Engineered data pipelines and automation workflows, reducing repeated task man-hours significantly.
- Developed image classification models and custom Python packages to meet project-specific needs.

Research Assistant, University of Maryland, College Park *May 2018 - December 2018*

- Designed and tested a novel decision tree algorithm, achieving superior performance on complex datasets.
- Published research findings internally and contributed to academic discussions on machine learning.

Teaching Assistant, University of Maryland, College Park *August 2017 - May 2018*

- Taught and graded undergraduate mathematics courses, providing additional support through office hours.

EDUCATION

Doctor of Philosophy in Technology, Capitol Technology University *2022*

- Research Area: Explainable Artificial Intelligence
- Dissertation: *Linear Regression Feature Engineering in Classification Tree Learning*

Master of Science in Business Analytics, University of Maryland *2018*

- GPA: 4.0

Bachelor of Science in Mathematics, University of Maryland *2017*

- GPA: 3.77, Honors College Citation

ADDITIONAL TECHNICAL PROJECTS

MLInsightLab

- Designed and implemented an open source containerized MLOps platform for machine learning model development and deployment, leveraging technologies such as Docker, Jupyter, MLflow, Transformers, FastAPI, Dask, and others.
- Utilized GitHub workflows and GitHub packages to automate the container building and publishing process, decreasing deployment time by over 50%.
- Successfully deployed the platform into multiple cloud environments, including environments with and without GPU acceleration, and utilized the platform to deploy multiple machine learning models for various use cases.
- Built a fully-featured Python SDK for interacting with the platform API.

Simulation Engine for Provably-Fair Gambling Platform

- Built and deployed a simulation engine to replicate results from games played on a provably-fair gambling platform.
- Implemented functionality allowing users to input parameters, simulate a specified number of games, and generate time series outputs replicating real gameplay results.
- Deployed simulation engine to Azure Functions, achieving scalability needed to automatically grow with overall platform usage.

Generative AI for Radiology Report Generation

- Trained a generative AI model to create radiology reports from various types of scans, leveraging real scans and associated reports authored by medical professionals.
- Worked with medical staff to design experimental procedures, including how to gather data from existing doctors' reports and how to train the model based on these reports.
- Upon receipt of data, preprocessed DICOM studies to extract images in a format compatible with model requirements.
- Fine-tuned a BLIP model using provided data, using approximately 4,000 image-report pairs for training and 500 pairs for testing. Results were verified by medical professionals and exceeded initial expectations, leading to further research.