JACOB RENN

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OBJECTIVE

Machine learning researcher with experience across a range of technologies, business levels, and industries seeking to utilize and grow his knowledge in a fast-paced, innovative environment.

SECURITY CLEARANCE

Top Secret/SCI with Full-Scope Polygraph (Current, Inactive)

EXPERIENCE

AI Squared, Inc. (Cofounder) ***September 2020 - Present***

Chief Technologist ***January 2023 - Present***

Overview

- **Plan and execute technology development within the company, with a focus on research, open source, and data science; report directly to the CEO, working across business units**

Duties and Accomplishments

- **Developed large language model applications which enable a model to interact with different tools and resources, helping to improve model performance and ensure users receive factual information**
- **Developed anomaly detection algorithms to help a customer identify machinery which may be more worn than previously identified, helping customers improve device performance and more efficiently allocate resources and personnel**
- **Developed DLite, a family of lightweight ChatGPT-like models which range from 124 million parameters to 1.5 billion parameters**
- **Plan and oversee the development of technologies built across multiple clouds, development environments, and programming languages**
- **Serve as company Head of Research and Open Source**
- **Maintain and lead company product-led growth strategy**
- **Assist in the planning and delivery of multiple federal engagements, including Small Business Innovation and Research (SBIR) projects and a Cooperative Research and Development Agreement (CRADA) with Intelligence Community (IC) partners**
- **Apply machine learning and technology development expertise to help develop cutting-edge technologies to help maintain and grow company's competitive advantage**
- **Created and lead development of the "BeyondML" project, which is an open source project which allows users to develop sparse, multitask neural networks in the PyTorch and TensorFlow frameworks. This project was accepted as a Linux Foundation project in 2022.**

Chief Technology Officer ***September 2020 - January 2023***

Overview:

- **Planned, directed, and executed technology development of a multi-million-dollar valued company with customers in both the public and private sector; oversee multiple departments, efforts, and teams; interface with customers and partners across a variety of efforts**

Duties and Accomplishments:

- **Managed multiple engineers, IT professionals, and business executives in the planning and development of company technology**
- **Provided technical support leading to contracts with multiple high-profile customers across public and private industry**
- **Contributed to company's Free and/or Open Source technology stack by serving as primary developer for various projects released to The Python Package Index**
- **Assisted in creating company technology plans contributing to company obtaining Series Seed Funding.**

- **Was primary developer on an approximately $250,000 subcontract involving the integration of existing ontologies into end-user workflows for federal customers**

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

Overview:

- **Serve as adjunct faculty for Doctoral Programs and the Department of Computer Science, including teaching undergraduate courses, sitting in as external examiner for student dissertation defenses, and advising doctoral students in their research**

Duties and Accomplishments:

- **To date, have served as external examiner for three PhD students in their dissertation defenses, utilizing technical and academic expertise to review student work and provide input regarding completion of program goals**
- **Taught CS-150: Programming in C to undergraduate students across a range of majors and prior programming experience. Teacher Overall Rating: 4.6/5**

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

Overview:

- **Provide data science expertise across a range of domains and application areas as a consultant and technical liaison between Microsoft and its federal customers**

Duties and Accomplishments:

- **Utilized deep learning expertise to create, train, and deploy machine learning models into proof-of-concept tool which has been showcased to multiple government agencies**
- **Assessed government requirements to help determine overall bid price and compile proposal materials on multiple contract opportunities**
- **Provided support to prime government contractor seeking to modernize existing system architecture and reliability**
- **Worked as part of a collaborative team with government personnel and other company consultants to develop advanced cloud based analytics to secure customer enterprise environment**

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

Overview:

- **Provided machine learning, analytic, and programming expertise in support of federal government researchers**

Duties and Accomplishments:

- **Worked with company leadership to expand business operations by submitting proposals to NSF and DoD customers to develop next-generation interpretable AI technologies**
- **Developed multipurpose software to facilitate end-to-end text experiments. Capabilities include extracting and preprocessing text, training models with user-specified hyperparameters, aligning hypothesis and reference data, and testing model performance by multiple scoring metrics**
- **Worked collaboratively to design and implement a system to iteratively obtain data from various sources and perform updates to BERT models by fine-tuning on this data utilizing a high performance computing environment**
- **Developed application allowing researchers and developers to access and process streaming text data at ingest speeds on the order of 100s of documents per second**
- **Worked with a small team of researchers, software engineers, and data scientists to improve neural network model performance on few shot text classification tasks**

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

Overview:

- **Employed a variety of computer science, mathematics, and software engineering skills to derive strategies and tools for extracting meaning from datasets of varying size and organizational structure**

Duties and Accomplishments:

- **Researched and applied a variety of natural language processing techniques, including topic modeling, automatic stopword detection, and document similarity**
- **Developed robust image classification models using data augmentation and image processing techniques**
- **Engineered data pipelines and automation workflows to significantly reduce man-hours spent on repeated tasks**
- **Created customized, installable Python packages to address project needs**
- **Revamped the onboarding and initial training process for new data scientists**
- **Interviewed external applicants applying to the data scientist position**

EDUCATION

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

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

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

- **4.0 GPA**

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

- **3.77 GPA, Honors College Citation**

RELEVANT SKILLS

- **Communication to technical and non-technical audiences**
- **Supervised and unsupervised machine learning**
- **Natural language processing**
- **Image processing**
- **Deep learning**
- **Large Language Models**
- **Data visualization**
- **Exploratory Data Analysis**
- **Microsoft Azure**
- **Mathematics**
- **Statistics**
- **Linux**
- **REST services**
- **Python Programming**
- **JavaScript Programming**
- **C Programming**
- **Git**
- **Cloud Computing**
- **TensorFlow**
- **PyTorch**
- **Scikit-Learn**
- **NumPy**