Christopher H. Greer, Ph.D.

Contact Information

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Professional Experience

Children's Hospital Colorado Aurora, Colorado
Data Scientist Advanced **November 2019 – Present**

I led implementation of predictive models into real-time clinical practice. I developed clinical models, provided software engineering and DevOps expertise, and piloted technologies for hospital applications (e.g., LLMs).

- Engineered a pipeline to serve predictions in live clinical records for, e.g., pediatric septic shock and serious bacterial infection. Scored ~ 500 patients per day with multiple scores per patient. 99% uptime and $\sim$minute latency. Responsible for $\sim 5\%$ of all custom models running in Epic nationwide. (Epic, Python, Podman)
- Architected and built a Retrieval Augmented Generation (RAG) pattern with ChatGPT artificial intelligence to cohort patients using information contained in clinical notes. Increased precision relative to existing methods from 0.33 to 0.65 while maintaining 95% recall. Eliminated more than 16 hours of manual review per 1000 patients in cohort. (Python, Azure OpenAI Service & AI Search)
- Redesigned existing process to analyze employee survey comments using ChatGPT artificial intelligence in a RAG pattern, saving more than 300 developer hours per year. (Python, Azure OpenAI Service & AI Search)
- Developed a risk stratification model for a hospital-acquired injury, attaining 80% recall with 75% precision on a highly-imbalanced (2% positive) dataset. Models were used to revamp nursing priorities as part of a hospital-wide performance improvement effort. (Python, R)
- Led data science team members modeling the risk of hospital acquired injury, likelihood of employee turnover, and a time series of hospital volumes using epidemiology data. Respiratory volume model enabled earlier contracting for travel nurse resources, decreasing cost for the 2024 respiratory season. (Data Robot)
- Co-author on clinical trial results for the sepsis models (currently in JAMA peer review). Spoke nationally to audiences on implementation and MLOps pipelines for real-time EHR models.

Oracle Broomfield, Colorado
Principal Data Scientist **February 2017 – November 2019**

- Incorporated geolocation data into the Oracle Identity Graph, saving $>$ \$1 million in annual data costs. (Python, Spark, AWS EMR, Docker)
- Designed and built a privacy-preserving record linkage algorithm, improving the quality of the match by 45%, scale by 30%, and standardizing the approach across thousands of datasets. (Scala, Spark, EMR, Docker)
- Designed and built a graph-quality measurement algorithm using a Monte-Carlo approach, demonstrating a $6\times$ improvement over deterministic graph approaches. (Scala, Spark, EMR, Docker)

KPMG Denver, Colorado
Sr. Associate Data Scientist **October 2015 – February 2017**

- Designed and built a document classification tool for end-users. Created a domain-specific language for ease-of-use. (Apache OpenNLP, Spark, Python, Elasticsearch)
- Utilized document classifier for information security and control for KPMG as well as data separation for large, multinational clients across millions of documents hundreds of TB in size.

Skills

Data: Bayesian statistics, machine learning, natural language processing, Fourier signal analysis, MCMC, record linkage, visualization, large-language model (LLM) prompt engineering, LLM retrieval augmented generation (RAG)
Technology: Apache Spark, Python, MATLAB, C, SQL, git, BASH, Docker/Podman, Luigi, Azure DevOps, Epic electronic health record (active certifications in Cogito, Caboodle, and Cognitive Computing), Azure/AWS, Data Robot, Elasticsearch, R, Scala
Leadership: Experience organizing and leading workshops and collaboration meetings, supervising junior team members, public speaking, agile development, writing/publishing, 2020 Breakthrough Prize in Fundamental Physics laureate for contributions to the Event Horizon Telescope.

Education

University of Chicago, Chicago, IL
- Ph.D., Astronomy and Astrophysics, 2012
- M.S., Astronomy and Astrophysics, 2004

Northwestern University, Evanston, IL
- B.A., Physics and Mathematics, 2002