Julia Kruk

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Graduate Researcher with the Stanford NLP Group, Data Scientist at Bombora, and CS Masters student at the Georgia Institute of Technology. I have 7 years of experience in Machine Learning and a Bachelor of Arts in Physics from Cornell University. My research focuses on the application of Computer Vision and Natural Language Processing techniques to Computational Social Science and the study of Multimodal Communication.

Experience

Graduate Researcher | Stanford NLP Group
August 2022 – Present

- Conducting research under supervision of Prof. Diyi Yang in Multimodal Communication, Computational Linguistics, and Computational Social Science.
- Special interests include AI for Creativity, Coded Language, AI-generated Image Detection, and Cross-Cultural Social Norms.

Data Scientist III | Bombora
February 2022 – Present

- Developing, enhancing, and maintaining Machine Learning architectures for identity resolution and intent discovery in the Business-to-Business Ad-Tech space.
- Creating novel evaluation methods to gauge model performance for scenarios with limited availability of ground-truth information and significant class imbalance.
- Conducting scale and quality analyses following every model deployment to ensure minimal disruption to downstream customer-facing applications.

Computer Scientist | SRI Center for Vision Technologies
June 2017 – January 2022

- Conducted applied research at the intersection of Machine Learning, Computer Vision, and NLP.
- Designed Autoencoder, Multimodal Embedding, GAN, Transformer, and non-Euclidean manifold algorithms for the purpose of content generation, anomaly detection, and social media analysis.
- Inventor on 3 patent applications stemming from applied research in these areas.
- Presented research at summits and organizations such as NYC Media Lab, Twitter, Cornell University and NYU.

Physics Research Assistant | LIGO Hanford Observatory, Caltech REU
June 2016 – December 2016

- Designed software that computes for ambient environmental noise in the interferometer, as well as determines the affected area. It has shown to decrease false dismissals of gravitational waves by a factor of 10 and is actively used by the observatory to this day.

Education

Master of Science in Computer Science | Georgia Institute of Technology
August 2022 – May 2024

- GPA: 4.0
- Specialization in Machine Learning, pursuing a Master's Thesis.
- Relevant Courses: *Graduate Machine Learning, Natural Language Processing, Graduate Algorithms, Explainable AI, Machine Learning with Limited Supervision.*

Bachelor of Arts in Physics | Cornell University
August 2014 – December 2018

- Graduated from the Honors Physics track with a concentration in Computer Science.

Skills

Advanced: Python, PyTorch, Tensorboard, Data Analysis, Mathematics, Public Speaking
Experienced: SQL, BigQuery, Git, VertexAI, Adobe Creative Cloud
Familiar: Java, MATLAB, Kubernetes, Docker
Languages: English, Russian

Publications & Patents

- **Impressions: Understanding Visual Semiotics and Aesthetic Impact [EMNLP 2023]**
  Julia Kruk, Caleb Ziems, Diyi Yang
  October 2023

- **Machine Learning Techniques for Internet Protocol Address to Domain Resolution Systems**
  Erik Matlick, Robert James Armstrong, Benny Lin, Nicholaus Eugene Halecky, Will Kurt, Nishann Mann, Julia Kruk
  US Patent Application Number: US-20230252324-A1
  August 2023

- **Determining intent from multimodal content embedded in a common geometric space**
  Julia Kruk, Jonah M Lubin, Karan Sikka, Xiao Lin, Ajay Divakaran
  US Patent Application Number: 16383437
  April 2020

- **Integrating Image and Text: Determining Multimodal Intent in Instagram Posts [EMNLP 2019]**
  Julia Kruk, Jonah Lubin, Karan Sikka, Xiao Lin, Dan Jurafsky, Ajay Divakaran
  November 2019

- **Embedding Multimodal Content in a Common Non-Euclidean Geometric Space**
  Karan Sikka, Ajay Divakaran, Julia Kruk
  US Patent Application Number: 16383429
  October 2019

- **Environmental Monitoring: Coupling Function Calculator**
  Julia Kruk, RMS Schofield
  August 2016