Alexander T.J. Barron

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Summary

Ph.D. with years of experience tackling new and unstructured data sets to solve novel problems, focused on data acquisition, NLP, and machine learning.

- Extensive experience in data collection and analaysis at terabyte-scale, from design to implementation to results.
- Broad experience with machine learning, deep learning, and nonparametric statistics.
- Excellent programming skills in Python and the Jupyter/Pandas stack. Now force-multiplied with LLMs, coding assistants, and the cloud.
- Practiced experience working with a diverse team, translating abstract questions into measurable analysis.

Skills

Programming/compute	Python (pandas, jupyter, scipy, numpy, matplotlib, scikit-learn, pytorch, tensorflow, etc.), R, SQL, Bash, mongodb, Entire AWS stack, Google Cloud Platform, coding assistant management, agents
Algorithms/techniques	NLP, ML, data mining, sentiment analysis, nonparametric statistics, bootstrapping, regression, topic modeling, clustering, embeddings, LLMs, fine-tuning, contrastive learning, Named Entity Recognition, prompting
Communication	Writer of 5+ publications; Associate instructor for multiple courses; Multiple conference presentations
Mentorship	Management of 2 undergruates' research work through writing and publication
Miscellaneous	Git, Github, *nix systems, SLURM, AWS, GCP, Docker, Gephi, LaTeX, jazz drumset

Work Experience and Projects

New York University Abu Dhabi & Max Planck Institute for Empirical Aesthetics *Abu Dhabi, UAE & Frankfurt, Germany*

Post-Doctoral Associate *September 2023 - present*

IU School of Informatics, Computing, and Engineering

Graduate Researcher *2014 - 2022*

- Measured individual and group power dynamics in political legislative speeches and government formation.
- Revealed differences in network clustering structure in collective identities online, from terabytes of Twitter profile data.
- Analyzed Twitter and Reddit content, part of the DARPA Next Generation Social Science grant, studying identity and group formation.
- Parsed the Bitcoin block chain and developed an indicator of anonymity-conscious decision-making by entities using Bitcoin.

Associate Instructor *2012 - 2021*

- Multiple courses: *Informatics Capstone*, *Information Infrastructure II*, *Research Methods in Informatics: Large-scale Social Phenomena*, *Mathematical Foundations of Informatics*. Topics include code management, security, ethics, Python and unix tools, information theory, quantitative techniques for measuring social information, introductory game theory, probability, foundational discrete mathematics

Selected academic contributions

- **Alexander T. J. Barron**, Jenny Huang, Rebecca L. Spang, Simon DeDeo. (2018). Individuals, institutions, and innovation in the debates of the French Revolution. *Proceedings of the National Academy of Sciences*, 115 (18).
  - This research won the 2018 Cozzarelli prize in Behavioral and Social Sciences, and was covered by multiple media including Christian Science Monitor, Ars Technica, and MIT Technology Review.
- Johan Bollen, Marijn Ten Thij, Fritz Breithaupt, **Alexander T. J. Barron**, Lauren A. Rutter, Lorenzo Lorenzo-Luaces, Marten Scheffer. (2021). Historical language records reveal a surge of cognitive distortions in recent decades. *Proceedings of the National Academy of Sciences*, 118 (30).
  - Featured in the United Nations Human Development Report 2021/2022, p. 31.
- **Alexander T. J. Barron**, Johan Bollen. Quantifying collective identity online from self-defining hashtags. (2022). *Scientific Reports*, 12, 15044.

Reviewer: Cognitive Science, PLOS One, ICWSM

Education

Ph.D. in Informatics Complex Systems Track *Indiana University, August 2012 - May 2022*

B.S. in Physics and Applied Mathematics *summa cum laude* *University of New Mexico, August 2006 - July 2011*

Selected Awards

2019 **Cozzarelli Prize in Behavioral and Social Sciences,** one of six such yearly prizes reflecting "scientific excellence and originality" from the National Academy of Sciences, USA.

2019-20 **NSF Research Traineeship award,** summer affiliate in Complex Networks and Systems. Total amount: $10,000.