Alexander T. J. Barron

CONTACT INFORMATION	Informatics East 400 919 E 10th Street Bloomington IN 47408	Email: atbarron@iu.edu Website: https://cogentmentat.github.io

EDUCATION

School of Informatics, Computing, and Engineering, Indiana University, Bloomington, USA

Ph.D. Candidate in Informatics, Complex System track   from August 2012
- Advisor: Johan Bollen

University of New Mexico, Albuquerque, New Mexico, USA

B.S. double major in Physics and Applied Mathematics   August 2011

RESEARCH INTERESTS

Cultural innovation
- Developing measurements of innovation and the *effectiveness* of innovation on new content in different contexts. Application of this approach in multiple cultural domains, including language, music, and visual artforms.

Identity, social group formation, and language use.
- Does identity inspire group formation, or vice versa? Measurement of these concepts using language as data.

SKILLS

- **Languages**: Python, R, Matlab, Bash
- **Python tools**: IPython, Jupyter notebook, pandas, scipy, numpy, matplotlib, scikit-learn, statsmodels, gensim, NLTK, Stanford NLP suite, others as necessary
- **Databases**: mongodb, MySQL, SQLite
- **Algorithms/techniques**: natural language processing, data mining, information-theoretical tools, sentiment analysis, nonparametric statistics, regression, machine learning
- **Other**: Git, Github, *NIX systems, Gephi, LaTeX
- **Most importantly**: Jazz Drumset (since 7 years old!)

PUBLICATIONS

Journals

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 is covered by multiple media including Christian Science Monitor and MIT Technology Review)

Rui Fan, Ali Varamesh, Onur Varol, **Alexander T. J. Barron**, Ingrid A. van de Leemput, Marten Scheffer, Johan Bollen. (2018). The minute-scale dynamics of online emotions reveal the effects of affect labeling. Nature Human Behavior, 20 (1).

Conference Presentations

Alexander T. J. Barron and Johan Bollen. *Social Media Analysis Bias Due to Performative Self-identification.* Data and Algorithm Bias Workshop, Conference on Information and Knowledge Management 2017, Singapore.

Alexander T. J. Barron and Johan Bollen. *Developing a Moral NLP Toolkit.* Conference on Complex Systems 2017, Cancún, Mexico.

Alexander T. J. Barron, Jenny Huang, and Simon DeDeo. *Speech Innovation During the French Revolution.* Conference on Complex Systems 2015, Phoenix, AZ.

Alexander T. J. Barron, Emilio Ferrara, Giovanni Ciampaglia, Alessandro Flammini. *Price, Popularity, and Growth Dynamics of Bitcoin.* Computational Approaches to Social Modeling Satellite, Websci 2014, Bloomington, IN.

Posters

Alexander T. J. Barron, Jenny Huang, Rebecca L. Spang. *Speech Innovation During the French Revolution*. Conference on Complex Systems 2015, Phoenix, AZ.
- (This poster won Honorable Mention in the Language, Linguistics, Cognition and Social Ecology Track)

EMPLOYMENT
HISTORY

Research Assistant   2014-present

IU School of Informatics and Computing
- currently analyzing Twitter and Reddit content, part of the DARPA Next Generation Social Science grant. We study the interplay between identity and group formation, focusing on word use and adoption, sentiment analysis, word embeddings, and Moral Foundations Theory (with Johan Bollen).
- developed information-theoretical tools to measure novelty and resonance of political speeches in parliament during the French Revolution, resulting in measurement of individual and group power dynamics (with Simon DeDeo).
- parsed the Bitcoin block chain and developed an indicator of anonymity-conscious decision-making by entities using Bitcoin (with Alessandro Flammini).

Associate Instructor   2012-2014

IU School of Informatics and Computing
- *Research Methods in Informatics: Large-scale Social Phenomena*: assisted in covering a number of quantitative techniques for measuring social information, including: information theory, measuring "distance" between social groups' texts using information-theoretical tools, introductory game theory, probability (and Bayesian interpretation), social status using PageRank. Responsibilities also included coaching students in Python.
- *Mathematical Foundations of Informatics*: ran supplementary lectures/labs and graded for a wide selection of foundational and discrete mathematics: mathematical logic, proofs, induction, sets, functions, formal languages and strings, finite state machines, graph theory, graph algorithms.

Student Technical Specialist   2007-2011

UNM Department of Physics and Astronomy
- I worked with the PHENIX Collaboration on multiple aspects of the silicon-based Forward Vertex (FVTX) particle detector at Brookhaven National Laboratory:
    - creation of a custom detector control GUI in Python
    - constructing test instruments for silicon detectors, subsequently testing them
    - constructing test apparatus for developing FPGA-based electronics and code
    - on-site and clean room work at Fermilab, Brookhaven, and Los Alamos National Laboratories

AWARDS, GRANTS
AND HONORS

- Poster Honorable Mention in Language, Linguistics, Cognition and Social Ecology Track and CCS'15
- UNM Regents' Scholar 2006-2010: a competitive award that includes leadership within the school and a renewable scholarship covering tuition, expenses, and stipend
- Louis Armstrong award for jazz drumset 2006
- New Mexico Jazz All-state band position winner 2005