Krishna Bathina

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EDUCATION

PhD, 2021
Indiana University
Complex Systems
MS, 2017
Indiana University
Computer Science
BS, 2014
University of Michigan
Complex Systems
BS, 2014
University of Michigan
Psychology

LINKS

http://www.krishnacb.com
https://github.com/kbathina

COMPUTER SKILLS

Programming
Python • Unix • R
Matlab • Mathematica

Tools
MySQL • Hadoop

Python Analysis
numpy • scipy • pandas
geopandas • nltk • scikit-learn
pymc3 • theano

Python Data
beautifulsoup • sqlalchemy

Python Visualization
matplotlib • seaborn • plotly

ANALYSIS SKILLS

Data Science
Big Data Analysis
Network Science
Sentiment Analysis
Machine Learning
Natural Language Processing
Parametric Statistics
Non-parametric Statistics
Bayesian Statistics

RESEARCH STATEMENT

While my research varies across many disciplines, my main interests revolve around universal patterns of resilience in systems that undergo shock and characterizing early warning indicators for these phase transitions. Examples of these systems are collective gameplay, emotional stability in depressed individuals, and community sentiment during adverse events.

RESEARCH EXPERIENCE & PROJECTS

System Resilience and Early Warning Indicators
- Collect data from APIs, clean and organize big data using MySQL
- Implement machine learning algorithms
- Calculate and characterize emotional trends using NLP
- Model fitting with data
- Null model building, bootstrapping, jack-knifing, statistical analysis

Community Detection in Graphs
- Make and reduce the complexity of a novel community detection method using the message passing algorithm
- Program graphing algorithms on networks of different sizes
- Statistical analysis using information entropy

Online Risk Communication
- Code and analyze participant responses about computer security

INDUSTRY EXPERIENCE

HRI Laboratories Intern
June 2016 - August 2016 | Malibu, CA
- Collected social media data from Tumblr using Hadoop with MapReduce
- Built, fit, and analyzed agent based models of the spread of viral protest hashtags using network analysis

LEADERSHIP & INVOLVEMENT

Young Researchers of the Complex Systems Society Treasurer
2018-2020 | Thessaloniki, Greece; Singapore, Singapore, Palma de Mallorca, Spain
- Organize the young researchers event at the yearly Conference of Complex Systems
- Set up scholarships for young researchers, find guest speakers and venues, and plan logistics for the event

TEACHING EXPERIENCE

I have taught classes from from 20 to 150 students. Some of my typical responsibilities include lesson planning, making exams and assignments, grading, proctoring and leading discussions.

- Information I-308: Information Representation (IU) — Aug 2019 - Dec 2019
- Information I-400: Collective Intelligence (IU) — Aug 2018 - Dec 2018
- Informatics I-210: Information Infrastructure I (IU) — Jan 2017 - May 2017
- Informatics I-201: Mathematical Foundations of Informatics (IU) — Aug 2014 - May 2015
- Complex Systems 209: Agent Based Models (UM) — Aug 2013- May 2014
- Complex Systems 391: Modeling in Political Science (UM) — Aug 2013- May 2014

JOURNAL PUBLICATIONS

• Bathina, Krishna C., and Filippo Radicchi. *Error-correcting decoders for communities in networks*. Applied Network Science 4.1 (2019): 9.
• Grim, Patrick, Mengzhen Liu, Krishna C. Bathina, Naijia Liu, and Jake William Gordon. ***How Stable Is Democracy? Suggestions from Artificial Social Networks.*** Journal on Policy and Complex Systems. (2018), Volume 4, Number 1.
• Bathina, Krishna C., et al. *An Agent-Based Model of Posting Behavior During Times of Societal Unrest*. International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation. Springer, Cham, 2017.

CONFERENCE PRESENTATIONS

• CCS 2019 - Physical Activity and Mood Dynamics on Twitter
• CCS 2018, NetSci 2018 - Error-Correcting Decoders for Communities in Networks
• CCS 2018, RSAI 2018 - Using Social Media Indicators to Study Regional Socio-Economic Resilience
• CCS 2017 (Cancun, Mexico) - Predicting Epistatic Interactions Using Information and Network Theory
• SBP-BRiMS 2017 (Washington DC, USA) - An Agent-Based Model of Posting Behavior During Times of Societal Unrest
• CHI 2016 (San Jose, CA) - Bridging the Gap between Privacy by Design and Privacy in Practice
• 3rd annual preconference on Dynamical Systems and Computational Modeling in Social Psychology, Society for Personality and Social Psychology 2014 (Austin, TX) - Grim P., Liu MZ, Bathina K., Liu N., Gordon J. Opinion Instability in Democratic and Anti-Democratic Networks: Suggestions from an Agent-Based Model.

OTHER PUBLICATIONS

• Bathina, KC, and Blythe, Jim. ***Instrumenting Simple Risk Communication to Enable Online Self-Protection.*** Federal Trade Commission.
• Ellis, Nick C., Ute Römer, and Matthew Brook O'Donnell. ***Usage-Based Approaches to Language Acquisition and Processing.*** The Language Learning Monograph Series (2016), Chapter 9.