Curriculum Vitae
Keith Burghardt

Contact Information:

Information Sciences Institute,   Telephone: (310) 448-9433
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Marina del Rey, CA, USA

General Information:

Education:
Ph.D.	Physics, University of Maryland, College Park, MD. June 2016.
	Thesis advisors: Profs. Michelle Girvan and William Rand
B.S.	Physics, University of Maryland, College Park, MD. June 2012.
	Magna Cum Laude with High Honors in Physics
	Undergraduate thesis advisor: Prof. Ho Jung Paik

Professional Experience:
2018-Present: Computer Scientist, USC Information Sciences Institute, Marina del Rey, CA
2016-2018:   Postdoctoral Researcher, University of California, Davis, CA

Prizes, Awards, and Scholarships
2023:	ShowCAIS Best Poster
2022:	Most Outstanding Pilot Project Poster, First Health Equity in Action Investigator Development Annual Workshop of the NIH National Institute on Minority Health and Health Disparities Research Coordinating Center to Reduce Disparities in Multiple Chronic Diseases (RCC-RD-MCD)
2022:	ASONAM 2022 Runner-Up Best Paper Award
2021:	ISI Meritorious Service Award
2018:	International Conference on Computational Social Science (IC2S2) Scholarship
2016:	ISI Director's Intern Award
2015:	Conference on Complex Systems Starred Paper Award

Research:

Publications:

Referenced Conference and Workshop Proceedings:
1. Luceri, L., Pantè, V., Burghardt, K., Ferrara, E. (2024). Unmasking the web of deceit: Uncovering coordinated activity to expose information operations on Twitter. In: TheWebConf 2024, (in press).
2. **Burghardt**, **K.**, Rao, A., Guo, S., He, Z., Chochlakis, G., Sabyasachee, B., Rojecki, A., Narayanan, S., & Lerman, K. (2024). Socio-Linguistic Characteristics of Coordinated Inauthentic Accounts. In: *ICWSM 2024*, (in press).

3. Hickey, D., Schmitz, M., Fessler, D., Smaldino, P. E., Muric, G., & **Burghardt, K.** (2023). Auditing Elon Musk's Impact on Hate Speech and Bots. In: *ICWSM 2023*, *17*(1), 1133-1137.

4. Chochlakis, G., Mahajan, G., Baruah, S., **Burghardt**, **K.**, Lerman, K., & Narayanan, S. (2023). Leveraging Label Correlations in a Multi-Label Setting: A Case Study in Emotion. In: *ICASSP 2023*, Rhodes Island, Greece, 2023, 1-5, doi: 10.1109/ICASSP49357.2023.10096864.

5. Chochlakis, G., Mahajan, G., Baruah, S., **Burghardt**, **K.**, Lerman, K., & Narayanan, S. (2023). Using Emotion Embeddings to Transfer Knowledge Between Emotions, Languages, and Annotation Formats. In: *ICASSP 2023*, Rhodes Island, Greece, 2023, 1-5, doi: 10.1109/ICASSP49357.2023.10095597.

6. Schmitz, M., Murić, G., & **Burghardt, K.** (2023). Detecting Anti-Vaccine Users on Twitter. In: *ICWSM 2023*, *17*(1), 787-795.

7. Schmitz, M., Murić, G., & **Burghardt, K.** (2022). Quantifying How Hateful Communities Radicalize Online Users. In: *ASONAM 2022*, 139-146. IEEE.

8. He, Y., **Burghardt**, **K.**, Guo S., & Lerman, K. (2022). Learning Fairer Interventions. In: *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*, 317–323.

9. Guo, S., **Burghardt**, **K.**, Rao A., & Lerman, K. (2022). Emotion Regulation and Dynamics of Moral Concerns During the Early COVID-19 Pandemic. In*: Proceedings of the 2022 16th International AAAI Conference on Web and Social Media: SocialSens Workshop*, doi:10.36190/2022.28.

10. He, Y., Rao, A., **Burghardt**, **K.**, & Lerman, K. (2021). Identifying Shifts in Collective Attention to Topics on Social Media. In: *SBP-BRiMS 2021, Lecture Notes in Computer Science*, 12720. Springer, Cham.

11. **Burghardt**, **K.**, Tavabi, N., Ferrara, E., Narayanan, S., & Lerman, K. (2021). Having a Bad Day? Detecting the Impact of Atypical Events Using Wearable Sensors. In: *SBP-BRiMS 2021. Lecture Notes in Computer Science*, Vol. 12720. Springer, Cham.

12. He, Y., Tran, C., Jiang, J., **Burghardt**, **K.**, Ferrara, E., Zheleva, E., & Lerman, K. (2021). Heterogeneous Effects of Software Patches in a Multiplayer Online Battle Arena Game. In: *Foundations of Digital Games (FDG '21).* Association for Computing Machinery, New York, NY, USA, Article 11, 1–9.

13. Santos, T., **Burghardt**, **K.**, Lerman, K., & Helic, D. (2021). Limiting Tags Fosters Efficiency. In: *13th ACM Web Science Conference 2021 (WebSci'21)*, 46-55.

14. **Burghardt**, **K.**, Hogg, T., D'Souza, R., Lerman, K., & Posfai, M. (2020). Origins of Algorithmic Instabilities in Crowdsourced Ranking. In: *Proceedings of the ACM on Human-Computer Interaction (CSCW 2020)*, 1-20.

15. Santos, T., **Burghardt**, **K.**, Lerman, K., & Helic, D. (2020). Can Badges Foster a More Welcoming Culture on Q&A Boards? In: *Proceedings of the International AAAI Conference on Web and Social Media (ICWSM 2020)*, 14: 969-973.

16. He, Y., **Burghardt, K.**, & Lerman, K. (2020). A Geometric Solution to Fair Representations In: *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (AIES 2020)*, 279-285.

17. **Burghardt, K.**, Hogg, T., & Lerman, K. (2018). Quantifying the Impact of Cognitive Biases in Question-Answering Systems. In: *Proceedings of the Twelfth International AAAI Conference on Web and Social Media (ICWSM)*, 12(1) 568-571.

18. Ferrara, E., Alipoufard, N., & **Burghardt, K.**, Gopal, C., Lerman, K. (2017). Dynamics of Content Quality in Collaborative Knowledge Production. In: *Proceedings of the Eleventh International AAAI Conference on Web and Social Media (ICWSM)*, 520-523.

19. Agarwal, T., **Burghardt**, **K.**, & Lerman, K. (2017). On Quitting: Performance and Practice in Online Game Play. In: *Proceedings of the Eleventh International AAAI Conference on Web and Social Media (ICWSM)*, 11(1), 452-455.

Journal Publications:

1. Schmitz, M., Muric, G., Hickey, D., & **Burghardt, K.** (2024). Do users adopt extremist beliefs from exposure to hate subreddits?. *Social Network Analysis and Mining*, *14*(1), 1-12.
2. Ruprechter, T., **Burghardt, K.,** & Helic, D. (2023). Poor attention: The wealth and regional gaps in event attention and coverage on Wikipedia. *PLoS one*, *18*(11), e0289325.
3. Uhl, J. H., Royé, D., **Burghardt, K.**, Aldrey Vázquez, J. A., Borobio Sanchiz, M., & Leyk, S. (2023). HISDAC-ES: Historical Settlement Data Compilation for Spain (1900–2020). *Earth System Science Data Discussions*, 1-51.
4. Pi, H., **Burghardt**, **K.**, Percus, A. G., & Lerman, K. (2023). Clique densification in networks. *Phys. Rev. E*, 107(4): L042301.
5. He, Y., **Burghardt**, **K.**, & Lerman, K. (2022). Leveraging Changepoint Detection to Discover Natural Experiments in Data. *EPJ-Data Science*, 11(49).
6. Abram, M., **Burghardt**, **K.**, Steeg, G.V., Galstyan, A., & Dingreville, R. (2022). Inferring topological transitions in pattern-forming processes with self-supervised learning. *NPJ Computational Materials,* 8(205).
7. **Burghardt**, **K.,** Uhl, J. H., Lerman, K., & Leyk, S. (2022). Road network evolution in the urban and rural United States since 1900. *Computers, Environment and Urban Systems*, 95: 101803.
8. **Burghardt**, **K.**, Guo, S., & Lerman, K. (2021). Unequal impact and spatial aggregation distort COVID-19 growth rates. *Philos. Trans. Royal Soc. A*, 380:20210122.
9. **Burghardt**, **K.**, He, Z., Percus, A. G., & K. Lerman. (2021). The emergence of heterogeneous scaling in research institutions. *Communications Physics*, 4(189).
10. Rao, A., Morstatter, F., Hu, M., Chen, E., **Burghardt**, **K.**, Ferrara, E., & Lerman, K. (2021). Political Partisanship and Anti-Science Attitudes in Online Discussions about Covid-19. *J Med Internet Res*, 23(6):e26692.
11. Ngo, S.C., Percus, A. G., **Burghardt**, **K.**, & Lerman, K. (2020). The Transsortative Structure of Networks. *Proc. R. Soc. A.*, 476: 20190772.
12. **Burghardt, K.** & Maoz, Z. (2020). Dyadic imbalance in networks. *Journal of Complex Networks*, 8(1): cnaa001.
13. **Burghardt**, **K.**, Rand, W., & Girvan, M. (2019). Inferring models of opinion dynamics from aggregated jury data *PLOS ONE*, 14(7):e0218312.
14. Turalska, M., **Burghardt**, **K.**, Rohden, M., Swami, A., & D'Souza, R. M. (2019). Cascading failures in scale-free interdependent networks. *Phys. Rev. E*, 99(3): 032308.
15. **Burghardt, K.** & Maoz, Z. (2018). Partial Shocks on Cooperative Multiplex Networks with Varying Degrees of Noise. *Sci. Rep.*, 8(1): 13619.
16. Lin, Y., **Burghardt**, **K.,** Rohden, M., Noel, P.-A., & D'Souza, R. M. (2018). Self-organization of dragon-king failures. *Phys. Rev. E*, 98(2): 022127.
17. **Burghardt**, **K.**, Alsina, E., Lerman, K., Rand, W., & Girvan, M. (2017). Myopia of Crowds: A Study of Community Evaluation on Stack Exchange. *PLOS ONE*, 12(3): e0173610.
18. **Burghardt**, **K.**, Verzijl, C., Huang, J., Ingram, M., Song, B., & Hasne, M. (2016). Testing Modeling Assumptions in the West Africa Ebola Outbreak. *Sci. Rep.*, 6: 34598 EP.
19. **Burghardt**, **K.**, Rand, W., & Girvan, M. (2016). Competing Opinions and Stubbornness: Connecting Models to Data. *Phys. Rev. E*, 93(3): 032305.

Book Chapters and Other One-Time Publications:

1. Alipourfard, N., **Burghardt, K.**, & Lerman, K. (2021). Disaggregation via Gaussian Regression for Robust Analysis of Heterogeneous Data. In: *Handbook on Computational Social Science Vol 2*. Eds: Uwe Engel, Anabel Quan-Haase, Xun Liu, Lars Lyberg.
2. **Burghardt, K.** (2017). 2017 Conference on Complex Systems Report, *SIAM DSWeb* [Online] *https://bit.ly/2VSSTOG*.

Internal Report:

> **Burghardt, K.**, & Girvan, M. (2013). Clustering Faculty in the Biosciences. *University of Maryland, College Park Internal Report*.

Presentations:

2022:	Invited seminar talk at Computer Vision for Cultural Heritage SIG at the Turing Invited talks at the ICWSM SocialSens Workshop, and Symposium of USC-Amazon Center on Trustworthy AI
2021:	Invited seminar talk at USC Information Sciences Institute Invited talks at SBP-BRiMS 2021, AI Futures Symposium (August), Networks
2020:	Invited talks at GRIDS@USC and NetSci 2020
2019:	Invited talk at GRIDS@USC
2018:	Invited seminars at Northeastern; UC Merced; USC Information Sciences Institute Invited talks at APS Far West Section Fall Meeting; 4th Annual International Conference on Computational Social Science; SIAM Workshop on Network Science; 4th Annual Postdoctoral Research Symposium
2017:	Invited talks at Conference on Complex Systems, International School and Conference on Network Science (2017)
2016:	Invited seminar at Information Sciences Invited talks at GRAD Presentation, Northeastern Presentation
2015:	Invited talks at Complexity in Business Conference; Conference on Complex Systems; SIAM Workshop on Network Science; Maryland-Mason Meeting
2014:	Invited talks at Complexity in Business Conference; CAM Graduate Workshop
2013:	Invited talk at Complexity in Business Conference

Posters:

2018:	Twelfth International AAAI Conference on Web and Social Media (ICWSM) Title: "Quantifying the Impact of Cognitive Biases in Question-Answering Systems"
2017:	3rd Annual Postdoctoral Research Symposium (2017) Title: "Cooperation Network Responses to Shocks"
2013:	Ki-Net Young Researcher Workshop (2013) Title: "Influence and Rumor Propagation in Equilibrium on Networks"

Grants and Contracts:

2023:	**Co-PI:** USC ISI Exploratory Research Award for "A.I.-Driven Meal Prescriptions To Meet Sociocultural and Nutritional Dietary Needs," $100K, May-1-23 to May-1-24
2022:	**Co-PI:** DARPA AIE EMPATH. $1.0M, Aug.-1-22 – Feb.-1-24 **Co-PI:** Southern California Center for Chronic Health Disparities in Latino Children and Families Pilot Project for "Analyzing Digital Menu," $50K, June-1-22 to May-31-23.

Co-PI: USC ISI Exploratory Research Award for "Why Resilience in Innovation is Necessary and How to Foster It," $100K, May-1-22 to May-1-23

2021:   **PI:** USC-Amazon Center for Secure and Trusted Machine Learning Award for "Fast Fair Decentralized Learning," $50K, Sept-1-21 to Sept-30-22

2021:   **PI:** USC ISI Exploratory Research Award for "Identifying Populations Susceptible to Anti-Science," $100K, May-1-21 to May-1-22

2021:   **Co-PI:** USC ISI Research Award for "FairPRS: Fairly Predicting Genetic Risks for Personalized Medicine," $100K, May-1-21 to May-1-22

2020:   **PI:** Sandia National Laboratories contract for "Unsupervised and Semi-Supervised Inference of Material States," $20K, Jan-1-21 to Jun-1-21

2019:   **Co-PI:** DARPA contract for "Bespoke: Learning bespoke interventions for optimizing performance in heterogenous populations," HR0011990114, $1.0M, Jul-23-2019 to May-31-2021

Service:

Professional:

2022-present: Editor, Social Network Analysis and Mining
          Editor, PLOS Complex Systems
          Associate Chair, CSCW

2020-present: Organizer of Fairness and Bias ISI Internal Seminar Series

2020-2023:   Co-Organizer of USC CKIDS Student research project

2022:   Co-organizer of the INTERSPEECH Special Session "Inclusive and Fair Speech
              Session chair of WebConf 2022 Social Network Analysis and Graph Algorithms Track
              Judge for ACM TrojanHacks Hackathon; judge for GRIDS MindSpark Hackathon

2020-2021:   Organizer of USC ISI's AI Seminar Series

2020:   Organizer of Summer School on Sensor-Based Behavioral Machine Learning (S3B2-ML)

2018:   Organizer of UC Davis Complex Systems Working Group

2015:   Project leader: Santa Fe Institute Complex Systems Summer School Research Project

Reviewing:

2023:   ICWSM, CSCW, PLOS ONE, PLOS Complex Systems, Humanities and Social Sciences Communications, EPJ Data Science, Journal of Industrial Ecology, Online Social Networks and Media, IEEE Transactions on Computational Social Systems

2022:   ICWSM, WSDM, ICDM, SBP-BRiMS, PNAS Nexus, OSNEM, Communications in Nonlinear Science and Numerical Simulation, EPJ Data Science, PLOS ONE, Physical Review E, Frontiers in Public Health, Information and Software Technology, Data in Brief

2021:   KDD, ICWSM, Nature Communications, Communications Physics, Inf. Process. Manage., OSNEM, Scientific Reports

2020:	The WebConf (formally WWW), AAAI, KDD, WSDM, CMAME, Proc. Royal Society A, EPJ Data Science, 6G Series IEEE Vehicular Technology Magazine, JSTAT, Inf. Process. Manage., Frontiers in Physics
	Panel review: "AI for Decision Support" (DOE)
2019:	ICWSM, WWW, KDD, WebSci, Frontiers of Big Data, Chaos, CMAME
	Proposal review: NSF MMS
2018:	Scientific Reports, Frontiers of Big Data, Chaos
2017:	Scientific Reports, PLOS ONE, IEEE Transactions on Computational Social Systems, Phys. Rev. E

Teaching:

Spring 2024: Lecturer DSCI 531 "Fairness in Artificial Intelligence"
Spring 2023: Co-lecturer DSCI 531 "Fairness in Artificial Intelligence"
Spring 2022: Co-lecturer DSCI 550 "Data Science at Scale"
Spring 2021: Co-lecturer DSCI 552 "Machine Learning for Data Science"
Fall 2019: Co-lecturer INF 553 "Foundations and Applications of Data Mining"