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Jiaming Cui

RESEARCH INTERESTS

My primary research interest is to bridge artificial intelligence with clinical decisions. My research focus is at the intersection of machine learning, scientific modeling, and public health, and my main application is on clinical decision-making.

EMPLOYMENT

Assistant Professor **Dec 2024 - present**
Department of Computer Science, Virginia Tech

Postdoctoral Research Associate **Sep 2024 - Dec 2024**
Biocomplexity Institute, University of Virginia
Supervisor: Anil Vullikanti and Gregory Madden

EDUCATION

Ph.D. in Computer Science **Aug 2019 - Aug 2024**
Georgia Institute of Technology
Advisor: B. Aditya Prakash

B.S. in Information Engineering & B.S. in Finance **Sep 2015 - Jul 2019**
Shanghai Jiao Tong University
Graduate with honors

PUBLICATION

Preprints

1. Jiaming Cui, Jack Heavey, Eili Y. Klein, Gregory R. Madden, Costi D. Sifri, Anil K. Vullikanti, B. Aditya Prakash. Identifying and Forecasting Importation and Asymptomatic Spreaders of Multi-drug Resistant Organisms in Hospital Settings. (npj Digital Medicine, under revision)
2. Lingkai Kong, Wenhao Mu, Jiaming Cui, Yuchen Zhuang, B. Aditya Prakash, Bo Dai, Chao Zhang. DF²: Distribution-Free Decision-Focused Learning. (UAI 2025, under review)

Conference and Journals

1. Jiaming Cui, Bijaya Adhikari, Arash Haddadan, A S M Ahsan-Ul Haque, Jilles Vreeken, Anil Vullikanti, B. Aditya Prakash. Accurately Estimating Unreported Infections using Information Theory. SDM 2025 (Washington DC).
2. Haoxin Liu, Shangqing Xu, Zhiyuan Zhao, Lingkai Kong, Harshavardhan Kamarthi, Aditya B. Sasanur, Megha Sharma, Jiaming Cui, Qingsong Wen, Chao Zhang, B. Aditya Prakash. Time-MMD: A New Multi-Domain Multimodal Dataset for Time Series Analysis. NeurIPS 2024 (Vancouver).
3. Jiaming Cui, Jack Heavey, Eili Y. Klein, Gregory R. Madden, Costi D. Sifri, Anil K. Vullikanti, B. Aditya Prakash. Identifying and Forecasting Importation and Asymptomatic Spreaders of Multi-drug Resistant Organisms in Hospital Settings. (poster). MIDAS 2024 (Washington DC).
4. Jiaming Cui, Jack Heavey, Leo Lin, Eili Y. Klein, Gregory R. Madden, Costi D. Sifri, Bryan Lewis, Anil K. Vullikanti, B. Aditya Prakash. Modeling Relaxed Policies for Discontinuation of Methicillin Resistant Staphylococcus aureus Contact Precautions. ICHE 2024.

5. Vivek Anand*, Jiaming Cui*, Jack Heavey, Anil Vullikanti, B. Aditya Prakash. H²ABM: Heterogeneous Agent-based Model on Hypergraphs to Capture Group Interactions. SDM 2024 (Houston). **[Best poster award]**
6. Jiaming Cui*, Sungjun Cho*, Methun Kamruzzaman, Matthew Bielskas, Anil Vullikanti, B. Aditya Prakash. Modeling Pathogen Transmission in Heterogeneous Networks: Spectral Characterization and Applications. Scientific Reports 2023.
7. Jiaming Cui, Jack Heavey, Leo Lin, Eili Y. Klein, Gregory R. Madden, Costi D. Sifri, Bryan Lewis, Anil K. Vullikanti, B. Aditya Prakash. Modeling Relaxed Policies for Discontinuation of Methicillin Resistant Staphylococcus aureus Contact Precautions. (poster). MIDAS 2023 (Atlanta).
8. Lingkai Kong, Jiaming Cui, Haotian Sun, Yuchen Zhuang, B. Aditya Prakash, Chao Zhang. Autoregressive Diffusion Model for Graph Generation. ICML 2023 (Hawaii).
9. Hankyu Jang, Andrew Fu, Jiaming Cui, Methun Kamruzzaman, B. Aditya Prakash, Anil Vullikanti, Bijaya Adhikari, Sriram Pemmaraju. Detecting Sources of Healthcare Associated Infections. AAAI 2023 (Washington DC).
10. Alexander Rodríguez, Jiaming Cui, Naren Ramakrishnan, Bijaya Adhikari and B. Aditya Prakash. EINNs: Epidemiologically-Informed Neural Networks. AAAI 2023 (Washington DC).
11. Jiaming Cui, Arash Haddadan, A S M Ahsan Ul Haque, Bijaya Adhikari, Anil Vullikanti and B. Aditya Prakash. Information Theoretic Model Selection for Accurately Estimating Unreported COVID-19 Infections (poster). MIDAS 2022 (Washington DC).
12. Lingkai Kong, Jiaming Cui, Yuchen Zhuang, Rui Feng, B. Aditya Prakash, Chao Zhang. End-to-end Stochastic Programming with Energy-based Model. NeurIPS 2022 (New Orleans).
13. Cramer, Estee Y., et al. [multiple co-authors, including Jiaming Cui] Evaluation of Individual and Ensemble Probabilistic Forecasts of COVID-19 Mortality in the United States. PNAS 2022.
14. Cramer, Estee Y., et al. [multiple co-authors, including Jiaming Cui] The United States covid-19 Forecast Hub Dataset. Scientific data 2022.
15. Jack Heavey, Jiaming Cui, Chen Chen, B. Aditya Prakash. Provable Sensor Sets for Epidemic Detection over Networks with Minimum Delay. AAAI 2022 (Vancouver).
16. Alexander Rodríguez, Anika Tabassum, Jiaming Cui, Jiajia Xie, Javen Ho, Pulak Agarwal, Bijaya Adhikari and B. Aditya Prakash. DeepCOVID: An Operational Deep Learning-driven Framework for Explainable Real-time COVID-19 Forecasting. IAAI 2021 (virtual).
17. Jiaming Cui, Huaying Wu, Luoyi Fu, XIaoying Gan. De-anonymizing Bitcoin Networks: an IP Matching Method via Heuristic Approach: poster. ACM TURC 2019 (Chengdu).

RESEARCH EXPERIENCE

Postdoctoral Research Associate

Sep 2024 - Dec 2024

University of Virginia

- Designed multiple deep learning and large language models to process real-world clinical data and notes and guide decision-making.
- Planning to implement the proposed models and algorithms in University of Virginia hospital.

Graduate Research Assistant
Georgia Institute of Technology

Aug 2019 - Aug 2024

- Designed and implemented diverse machine learning methods to address pressing public health and clinical challenges.
- Processed and analyzed large clinical datasets of 120 million insurance records for over 6 million people in Virginia.
- Contributed to the CDC COVID-19 response strategy with forecasting reports, ranked top 5 among 90 groups.
- Published at top conferences and journals such as NeurIPS, ICML, AAAI and received multiple awards in machine learning competitions.
- Collaborating closely with domain specialists, including CDC officials, epidemiologists, computer scientists, and clinicians.

Undergraduate Research Assistant
Shanghai Jiao Tong University

Mar 2017 - Jul 2019

- Designed data mining algorithms to identify the most influential papers within specific research fields (funded by National Science Foundation of China (NSFC)).
- Processed and analyzed large datasets of academic network covering 222 million papers and 104 million authors using Python.
- Designed a website for data visualization, achieving 10k+ visits since 2019.

TEACHING EXPERIENCE

Teaching Assistant
CSE 8803 Introduction to Urban Computing

Jan 2023 - May 2023

Teaching Assistant
CSE 8803 Data Science for Epidemiology

Aug 2021 - Dec 2021

SERVICE

Program Committee

- 2025: SDM
- 2024: IEEE Big Data, ASONAM
- 2023: KDD epiDAMIK, ASONAM
- 2022: KDD epiDAMIK

Reviewer

- 2025: ICML, ICLR, AISTATS
- 2024: NeurIPS, CVPR, ACM TIST, IEEE AVSS
- 2023: KDD, IEEE Intelligent Systems, PLOS Global Public Health
- 2022: KDD, IEEE TKDE, DAMI

AWARDS

SDM 2024 Best Poster Award

Apr 2024

SDM 2024 Travel Award (by IBM)
Awarded \$1000

Feb 2024