Utkarshani Jaimini

Contact Information

Artificial Intelligence Institute
University of South Carolina
Columbia, SC 29208, USA

Email: ujaimini@email.sc.edu
Mobile: (937) 972-8652
website: https://utkarshani.github.io/

Research Interest

I am passionate about advancing AI with human-like causal understanding using causal and neuro-symbolic methods. My research drives innovative solutions to real-world challenges via collaborations with industries to deliver impactful results. The chance to learn continuously and create meaningful change through technology fuels my motivation and purpose.

Education

University of South Carolina
Ph.D. Candidate, Artificial Intelligence Institute (expected graduation date: May 2025) Transferred from Wright State University

- **Dissertation**: Causal Neuro-symbolic AI: A Synergy between Neuro-symbolic and Causal AI. Knowledge Graph Enabled Causal Discovery
- **Advisor**: Amit P. Sheth

Wright State University
M.S., Computer Science and Engineering, 2018

Industry Research Experience

Bosch Center for AI, Neuro-symbolic Al, Intern, Summer 2023

Siemens Incorporation, Physics-Informed AI, Intern, Summer 2022

Bosch Center for AI, Neuro-symbolic AI for Autonomous Driving, Intern, Summer 2021

Teaching Experience

Department of Computer Science and Engineering
Teaching assistant, Algorithm Design I, Fall 2024

Teaching assistant, Algorithm Design II, Fall 2020

Artificial Intelligence Institute
Teaching assistant (taught primer to causal AI), Artificial Intelligence Summer School, Summer 2024

Proposal Contributions

InterACT-MI: A Chatbot-delivered Motivational Interviewing Intervention for Adolescents with Asthma, Agency: NIH, Amount: $1.7M (***Lead student contributor***)

MURI: Developing a Computational Approach for Understanding Information Exchange Network Dynamics, Agency: ARO, Amount: $6.25M

kHealth-OA: A Multisensory Data-enhanced Evidence-based Obesity Management in Children with Asthma, Agency: NIH, Amount: $1.1M (***Lead student contributor***)

Supported by Grants

RII Track 2 FEC: Enabling Factory to Factory (F2F) Networking for Future Manufacturing, Agency: NSF, Amount: $739k

EAGER: Knowledge-guided Neuro-symbolic AI with Guardrails for Safe Virtual Health Assistants, Agency: NSF, Amount: $200k

EAGER: Advancing Neuro-symbolic AI with Deep Knowledge-infused Learning, Agency: NSF, Amount: $140k

SCH kHealth: Semantic Multisensory Mobile Approach to Personalized Asthma Care, Agency: NIH NICHD, Amount: $938k

Awards and Fellowships

AnitaB-GHC: AnitaB Grace Hopper **Scholarship**. Sponsored by Two Sigma 2020

CRA-WP: Computing Research Association Widening Participation **Scholarship** for a Grad Cohort for Women, 2020

ISWC: International Semantic Web Conference (**ISWC**) Travel award 2023-2024

ACM OCWiC: ACM Ohio Celebration of Women in Computing travel award, 2019 and 2017

ACM-W TriWiC: ACM-Women Tri-state Women in Computing celebration travel award 2018

IEEE SmartComp: 3rd IEEE International Conference on Smart Computing travel award 2017

ICHI: 5th International Conference on Healthcare Informatics (ICHI) travel award 2016

Mentoring

Sara Shree Muthuselvam, Undergrad, University of South Carolina, 2024

Utkarsh Bhatt, Undergrad, Indian Institute of Technology Kharagpur, 2024

Srianeesh Kalva, Spring Valley High School, Columbia, 2024

Nishanth Gaddam, Charlotte Latin School, Charlotte, 2022-2023

Madeline McInnis, Undergrad - School of Nursing, University of South Carolina, 2022-2023 (**Best undergrad poster award** in School of Nursing at Discover USC. Title: Self-Management of Asthma in the Pediatric Patient: A Study of Artificially Intelligent Chatbots)

Professional Activities

Chair/Organizer

Area Chair: Women in Machine Learning **(WiML)** at Conference on Neural Information Processing Systems **(NeurIPS)** 2022

Session Chair: lead a research roundtable on "Causality and inductive bias for stability, robustness, and generalization and detecting failure modes of machine learning systems", at Machine Learning for Health **(ML4H)** 2021

Session Chair: Health on the Web track, **The Web Conference** 2020

Organizer and Moderator: Conference on Collaboration Assistants for Society **(CASY)**, AI Institute hosted conference at University of South Carolina 2020-2021

Program Committe:
AI4PH: AI for Public Health (AI4PH) Workshop at International Conference on Learning Representation (**ICLR**) 2021

SMDS: IEEE International Conference on Smart Data Services, Causal Learning track 2021

CASY: Conference on Collaboration Assistants for Society, 2020-2021

KiML: ACM Knowledge Discovery and Data Mining (**KDD**), Knowledge-Infused Mining and Learning (KiML) Workshop, 2020-2021

The Web Conference: Information on the Web and Society track, 2021-2022

The Web Conference: Health on the Web track, 2018 and 2020

SSN: International Semantic Sensor Network (SSN) workshop series at International Semantic Web Conference (**ISWC**) 2018-2019

SAW: International Workshop on Sensors and Actuators on the Web (SAW) 2019

Journal Reviewer
Nature Digital Medicine

IEEE Sensors

Springer Nature Scientific reports

IEEE Internet Computing

Transactions on Fuzzy Systems

Semantic Web Journal

Journal of Web Semantics

JMIR- Journal of Medical Internet Research

Conference Reviewer
The Web Conference

KDD: ACM Knowledge Discovery and Data Mining

IEEE International Conference on Fuzzy Systems

WSDM: ACM International Conference on Web Search and Data Mining

Workshop Reviewer
NewInML at Conference on Neural Information Processing Systems (NeurIPS) 2021 (reviewer and mentor)

Knowledge-Infused Mining and Learning (KiML) at ACM Knowledge Discovery and Data Mining 2020

Workshop on Ontology Design and Patterns (WOP) at International Semantic Web Conference (ISWC) 2024

Tutorial **Utkarshani Jaimini**, Usha Lokala, Kaushik Roy, Amit Sheth, Causal AI on Web and Health, **The Web Conference** 2023

Workshop **Utkarshani Jaimini**, Cory Henson, Amit Sheth, Yuni Susanti, ***Causal Neuro-symbolic Artificial Intelligence***, **Extended Semantic Web Conference (ESWC)** 2025

Invited Talks

Shell Technology Center, Houston, Texas, 2024

KGC: Workshop on Representing and Reasoning with Imperfect Knowledge at Knowledge Graph conference (KGC) 2022

Patent

Knowledge graph for interoperability in industrial metaverse for engineering and design applications U.S. Patent 20240037292A1 2024 (Pending, collaboration with Siemens Incorporation)

Causal discovery using Knowledge Graph Link Prediction 2024 (Submitted, collaboration with Bosch Center for AI)

Causal discovery using Knowledge Graph Link Prediction with Hyper Relations 2024 (To be submitted, collaboration with Bosch Center for AI)

Causal discovery using Knowledge Graph Link Prediction without Backdoor Paths 2024 (To be submitted, collaboration with Bosch Center for AI)

Publications

Causal Neuro-symbolic AI

1. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. CausalLP: Learning Causal Relations with Weighted Knowledge Graph Link Prediction. Link: https://arxiv.org/abs/2405.02327 , 2024

2. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. HyperCausalLP: Causal Link Prediction using Hyper- Relational Knowledge Graph. (In revision)

3. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. Causal Relation Learning through Knowledge Graph Link Prediction by Eliminating Backdoor Paths. (In revision)

4. **Utkarshani Jaimini**, Cory Henson, Amit Sheth, and Ramy Harik. Causal Neuro-symbolic AI for Root Cause Analysis in Smart Manufacturing. 23rd International Semantic Web Conference (**ISWC**), 2024 **(A)**

5. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. Causal Neuro-symbolic AI based Causal Entity Prediction in Autonomous Driving. 23rd International Semantic Web Conference (**ISWC**), 2024 **(A)**

6. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. Visual Causal Question and Answering with Knowledge Graph Link Prediction. 23rd International Semantic Web Conference (**ISWC**) (Poster, Demo), 2024 **(A)**

7. **Utkarshani Jaimini**, Ruwan Wickramarachchi, Cory Henson, and Amit Sheth. Ontology Design Metapattern for RelationType Role Composition. 15th Workshop on Ontology Design and Patterns (WOP) at 23rd International Semantic Web Conference (**ISWC**), 2024

8. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. Causal Neuro-symbolic AI: A Synergy between Causality and Neuro-symbolic Methods. **IEEE Intelligent Systems**, vol. 39, no. 3, 2024 (*Also part of Causal Data Science Meeting 2024*) **(Q1), IF=5.6**

9. **Utkarshani Jaimini**, Cory Henson, and Amit Sheth. An Ontology Design Pattern for representing Causality. 14th Workshop on Ontology Design and Patterns (WOP) at 22nd International Semantic Web Conference (**ISWC**), 2023

10. **Utkarshani Jaimini** and Amit Sheth. CausalKG: Causal Knowledge Graph Explainability Using Interventional and Counterfactual Reasoning. **IEEE Internet Computing**, vol. 26, no. 1, 2021 **(Q1), IF=3.7**

Large Language Models

1. Arka Dutta, **Utkarshani Jaimini**, Sara Muthuselvam, Utkarsh Bhatt, Amitava Das, and Ashique KhudaBukhsh. Auditing and Robustifying AI-generated Content Detection Systems via Anticontent Sampling. (In process)

Industrial Metaverse

1. **Utkarshani Jaimini**, Tongtao Zhang, Olympia Georgia Brikis, and Amit Sheth. iMetaverseKG: Industrial Metaverse Knowledge Graph to Promote Interoperability in Design and Engineering Applications. **IEEE Internet Computing**, vol. 26, no. 6, 2022 **(Q1), IF=3.7**

2. **Utkarshani Jaimini**, Tongtao Zhang, and Olympia Georgia Brikis. MetaverseKG: Knowledge Graph for Engineering and Design Application in Industrial Metaverse. 21st International Semantic Web Conference (**ISWC**), 2022 **(A)**

Healthcare

1. **Utkarshani Jaimini**, Krishnaprasad Thirunarayan, Maninder Kalra, Robin Dawson, and Amit Sheth. Personalized Bayesian Inference for Explainable Healthcare Management, and Intervention. Human-Centered XAI: Enhancing AI Acceptability for Healthcare Workshop at 12th International Conference of Healthcare Informatics (**ICHI**), 2024

2. Amelie Gyrard, **Utkarshani Jaimini**, Manas Gaur, Saeedeh Shekharpour, Krishnaprasad Thirunarayan, and Amit Sheth. Reasoning Over Personalized Healthcare Knowledge Graph: a Case Study of Patients with Allergies and Symptoms. **Semantic Models in IoT and eHealth Applications**, pages 199-225, 2022 (**Book Chapter**)

3. **Utkarshani Jaimini** and Amit Sheth. Personalized Digital Phenotype Score, Healthcare Management and Intervention Strategies Using Knowledge Enabled Digital Health Framework for Pediatric Asthma. **In Recent Advances in Asthma Research and Treatments, IntechOpen**. 2021 (**Book Chapter**)

4. **Utkarshani Jaimini**, Krishnaprasad Thirunarayan, Marco Valtorta, Maninder Kalra, and Amit Sheth. Personalized Healthcare and Causal Intervention. Extended Abstract in 6th Machine Learning for Health (**ML4H**) workshop at 34th Conference on Neural Information Processing Systems (**NeurIPS**), 2020

5. **Utkarshani Jaimini**, Amit Sheth, Krishnaprasad Thirunarayan, Maninder Kalra, and Marco Valtorta. Is It Safe for My Child's Asthma? 6th International Conference on Computational Social Science, (**IC^{2}S^2**), 2020

6. Revathy Venkataramanan, Krishnaprasad Thirunarayan, **Utkarshani Jaimini**, Dipesh Kadariya, Hong Yong Yip, Maninder Kalra, and Amit Sheth. Determination of Personalized Asthma Triggers from Multimodal Sensing and a Mobile App: Observational Study. **JMIR Pediatrics and Parenting**, 2(1), p.e14300, 2019 **(Q2), IF=2.1**

7. **Utkarshani Jaimini**, Krishnaprasad Thirunarayan, Maninder Kalra, Revathy Venkataramanan, Dipesh Kadariya, and Amit Sheth. "How Is My Child's Asthma?" Digital Phenotype and Actionable Insights for Pediatric Asthma. **JMIR Pediatrics and parenting**, 1(2), p.e11988, 2018 **(Q2), IF=2.1**

8. Amit Sheth, Hong Yong Yip, **Utkarshani Jaimini**, Dipesh Kadariya, Vaikunth Sridharan, Revathy Venkataramanan, Tanvi Banerjee, Krishnaprasad Thirunarayan, and Maninder Kalra. Augmented Personalized Health: Using Semantically Integrated Multimodal Data for Patient Empowered Health Management Strategies. Poster in mHealth Technology Showcase, National Institute of Health (NIH), 2018

9. **Utkarshani Jaimini**, Hong Yong Yip, Revathy Venkataramanan, Dipesh Kadariya, Vaikunth Sridharan, Tanvi Banerjee, Krishnaprasad Thirunarayan, Amit Sheth, and Maninder Kalra. kHealth Digital Personalized Healthcare Technology for Pediatric Asthma. Poster in mHealth Technology Showcase, National Institute of Health (NIH), 2018

10. **Utkarshani Jaimini**, Hong Yong Yip, Revathy Venkataramanan, Dipesh Kadariya, Vaikunth Sridharan, Krishnaprasad Thirunarayan, Amit Sheth, and Maninder Kalra, kHealth: A Personalized Healthcare Approach for Pediatric Asthma. Poster in National Science Foundation (NSF) Smart Health Workshop, 2018

11. Amit Sheth, Hong Yong Yip, **Utkarshani Jaimini**, Dipesh Kadariya, Vaikunth Sridharan, Revathy Venkataramanan, Tanvi Banerjee, Krishnaprasad Thirunarayan, and Maninder Kalra. Feasibility of recording sleep quality and sleep duration using Fitbit in children with asthma. Abstract in 32nd Annual Meeting of the Associated Professional Sleep Societies, LLC.in, 3-5 June 2018. REM, 95(86.09), pp.91-87, 2018 **(Q1), IF=4.8**

12. Amit Sheth, Tanvi Banerjee, **Utkarshani Jaimini**, Dipesh Kadariya, Vaikunth Sridharan, Krishnaprasad Thirunarayan, Revathy Venkataramanan, Hong Yong Yip, and Maninder Kalra. Correlating Multimodal Signals with Asthma Control in Children Using KHealth Personalized Digital Health System. Abstract in American Thoracic Society International Conference (**ATS**), 2018 **(Q1), IF=15.24**

13. Amit Sheth, **Utkarshani Jaimini**, and Hong Yong Yip. How will the Internet of Things enable augmented personalized health? **IEEE Intelligent Systems**, 33(1), pp.89-97, 2018 **(Q1), IF=5.6**

14. Sarah Sohail, Joon K. Shim, Revathy Venkataramanan, **Utkarshani Jaimini**, Dene S. Berman, Priti Parikh and Amit Sheth. A Multisensory Approach to Monitor Bariatric Patient's Postsurgical Behavior and Lessen Weight Recidivism. Surgery for Obesity and Related Diseases, 13(10), pp. S139-S140, 2017 **(Q1), IF=4.49**

15. Amit Sheth, **Utkarshani Jaimini**, Krishnaprasad Thirunarayan, and Tanvi Banerjee. Augmented personalized health: How smart data with IoTs and ai is about to change healthcare. In 2017 IEEE 3rd International Forum on Research and Technologies for Society and Industry (**RTSI**) (pp. 1-6), 2017

16. **Utkarshani Jaimini**. Multimodal IoT and EMR based Smart Health Application for Asthma Management in Children. In IEEE 3rd International Conference on Smart Computing (**SMARTCOMP**) (pp. 1-2), 2017

17. Revathy Venkataramanan, **Utkarshani Jaimini**, Amit Sheth, Joon K. Shim, Priti Parikh, and Dene S. Berman. KHealth Bariatrics: A Multisensory Approach to Monitoring Patients' Post-Surgical Behavior. Wright State University Celebration of Research, Scholarship, and Creative Activities, 2017

18. **Utkarshani Jaimini**, Tanvi Banerjee, William Romine, Krishnaprasad Thirunarayan, Amit Sheth and Maninder Kalra. Investigation of an Indoor Air Quality Sensor for Asthma Management in Children. **IEEE sensors letters**, 1(2), pp.1-4, 2017 **(Q2), IF=2.2**

Others

1. **Utkarshani Jaimini**, Varun Kumar Ojha, Millie Pant, and Ajith Abraham. Research network analyses of Indian computer science researchers: Problems and solutions. In 2nd IEEE International Conference on Computing for Sustainable Global Development (**INDIACom**) (pp. 1452-1458), 2015

2. **Utkarshani Jaimini** and Vinod Kumar Panchal. Wisdom application in Swarm: A WisSwarm Approach. In 2014 IEEE 1st International Conference on Reliability Optimization and Information Technology (**ICROIT**) (pp. 53-56), 2014

3. **Utkarshani Jaimini** and Vinod Kumar Panchal. Swarm Intelligence computational paradigm. In IEEE 1st International Conference on Emerging Trends in Communication, Control, Signal Processing and Computing Applications (**C2SPCA**) (pp. 1-8), 2013