Sanghack Lee, Ph.D.

Contact Information

Department of Computer Science
Columbia University
New York, NY 10027, USA

+1-515-509-6047
sanghacklee@cs.columbia.edu
sanghack.lee@gmail.com

Research Interests

Causal Inference and Causal Discovery in a Propositional or Relational Setting. Sequential Decision Making Problems from the Aspect of Causality. Practical Causal Modeling for Common Sense. Incorporating Game Theory and Irrationality into Causal Framework.

Employment

Columbia University, New York

Associate Research Scientist, Computer Science **2019 – present**

Investigate ranges of causality problems from classical causal inference to its application to sequential decision making.

Education

Purdue University

Postdoctoral-Research Associate, Computer Science
Advisor: Prof. Elias Bareinboim **2018 – 2019**

Pennsylvania State University, University Park

Ph.D., College of Information Sciences and Technology
Advisor: Prof. Vasant G. Honavar **2018**

Sogang University, Seoul, Republic of Korea

MS., Computer Science and Engineering **2006**
BE., Computer Science and Engineering, *Cum Laude* **2004**

Publications

$*$ for equally contributed authors.

Sanghack Lee, Juan D. Correa, and Elias Bareinboim (2020). General Transportability: Synthesizing Observations and Experiments from Heterogenous Domains. In *Proceedings of Thirty-fourth Conference on AAAI Conference on Artificial Intelligence (AAAI 2020)*

Sanghack Lee, Juan D. Correa, and Elias Bareinboim (2019). General Identifiability with Arbitrary Surrogate Experiments. In *Proceedings of Thirty-fifth Conference on Uncertainty in Artificial Intelligence (UAI 2019)*

Sanghack Lee and Vasant Honavar (2019). Towards Robust Relational Causal Discovery . In *Proceedings of Thirty-fifth Conference on Uncertainty in Artificial Intelligence (UAI 2019)*

Aria Khademi, **Sanghack Lee**, David Foley, Vasant Honavar (2019). Fairness in Algorithmic Decision Making: An Excursion Through the Lens of Causality. In *Proceedings of 2019 International Conference on World-Wide Web (WWW 2019)*

Sanghack Lee and Elias Bareinboim (2019). Structural Causal Bandits with Non-manipulable Variables. In *Proceedings of Thirty-third AAAI Conference on Artificial Intelligence (AAAI 2019)*

Sanghack Lee and Elias Bareinboim (2018). Structural Causal Bandits: Where to Intervene?. *In Advances in Neural Information Processing Systems 31 (NeurIPS 2018)*

Sanghack Lee and Vasant Honavar (2017). Self-Discrepancy Conditional Independence Test. In *Proceedings of Thirty-third Conference on Uncertainty in Artificial Intelligence (UAI 2017)*

Sanghack Lee and Vasant Honavar (2017). A Kernel Conditional Independence Test for Relational Data. In *Proceedings of Thirty-third Conference on Uncertainty in Artificial Intelligence (UAI 2017)*

Sanghack Lee and Vasant Honavar (2016). A Characterization of Markov Equivalence Classes of Relational Causal Models under Path Semantics. In *Proceedings of Thirty-second Conference on Uncertainty in Artificial Intelligence (UAI 2016)*. 387–396

Kyungsik Han, **Sanghack Lee**, Jin Yea Jang, Yong Jung, and Dongwon Lee (2016). "Teens are from Mars, Adults are from Venus": Analyzing and Predicting Age Groups with Behavioral Characteristics in Instagram. In *Proceedings of Eighth International ACM Web Science Conference 2016 (WebSci 2016).* 35–44

Sanghack Lee and Vasant Honavar (2016). On Learning Causal Models for Relational Data. In *Proceedings of Thirtieth Conference on Artificial Intelligence (AAAI 2016)*. 3263–3270

Sanghack Lee and Vasant Honavar (2015). Lifted Representation of Relational Causal Models Revisited: Implications for Reasoning and Structure Learning. In *Proceedings of the UAI 2015 Workshop on Advances in Causal Inference co-located with the 31st Conference on Uncertainty in Artificial Intelligence (UAI 2015).* 56–65

Elias Bareinboim*, **Sanghack Lee***, Vasant Honavar, and Judea Pearl (2013). Transportability from Multiple Environments with Limited Experiments. In Advances in Neural Information Processing 26 (NIPS Proceedings), 136–144

Sanghack Lee and Vasant Honavar (2013). *m*-Transportability: Transportability of a Causal Effect from Multiple Environments. In *Proceedings of the Twenty-seventh Conference on Artificial Intelligence (AAAI 2013)*. 583–590

Sanghack Lee and Vasant Honavar (2013). Causal Transportability of Experiments on Controllable Subsets of Variables: *z*-Transportability. In *Proceedings of the Twenty-ninth Conference on Uncertainty in Artificial Intelligence (UAI 2013)*. 361–370

Harris Lin*, **Sanghack Lee***, Ngot Bui* and Vasant Honavar (2013). Learning Classifiers from Distributional Data. In IEEE Second International Congress on Big Data. 302–309

Sanghack Lee, Jihoon Yang and Sungyong Park (2006). A New Polynomial Time Algorithm for Bayesian Network Structure Learning. Advanced Data Mining and Applications, Second International Conference (ADMA 2006): Springer, Lecture Notes in Computer Science, Vol. 4093. 501-508.

Sanghack Lee, Jihoon Yang and Sung-Yong Park (2004). Discovery of Hidden Similarity on Collaborative Filtering to Overcome Sparsity Problem. Discovery Science 2004 (DS 2004): Springer, Lecture Notes in Computer Science, Vol. 3245 396-402.

Talks, Tutorials, Posters

- AAAI'2020 (New York, NY), talk
- AAAI'2020 (New York, NY), invited talk
- UAI'2019 (Tel Aviv, Israel), talk (*)
- IJCAI'2019 (Macau), "Causal Reinforcement Learning", tutorial (*)
- ISysE Seminar at KAIST (Apr, 2019) (Daejeon, South Korea), invited talk
- AAAI'2019 (Hawaii), talk
- NeurIPS'2018 (Montreal, Canada), poster
- Causality workshop at UAI'2017 (Sydney, Australia), talk
- UAI'2017 (Sydney, Australia), two posters
- UAI'2016 (Jersey City, NJ), talk

- AAAI'2016 (Phoenix, AZ), talk
- Causality workshop at UAI'2015 (Amsterdam, Netherlands), poster
- AAAI'2013 (Bellevue, WA), talk
- UAI'2013 (Bellevue, WA), poster

* someone else substituted for me.

Professional Service

Program Committee / Reviewers

- UAI 2020
- ICML 2020
- AAAI 2020
- AISTATS 2020
- NeurIPS 2019 (Best Reviewer Award)
- Journal of Machine Learning Research (JMLR) (2019)
- WHY 2019
- Causality Workshop at UAI 2017
- ACM CHI 2016
- ACM TIST Special Issue on Causal Discovery and Inference 2014

External Reviews

- IJCAI 2019
- ICML 2019
- NeurIPS 2018

Industrial Experience

Senior Engineer at **Diquest, inc.**, Seoul, South Korea **February 2006 to June 2009**
Development and maintenance of an enterprise search engine (server and client programming)

Research Experience

Associate Research Scientist, Columbia University **July 2019 – Present**

Post-doctoral Research Associate, Purdue University **2018 – June 2019**

Research Assistant, Pennsylvania State University **2013 – 2014**, **2015 – 2018**

Research Assistant, Iowa State University **2011 – 2013**

Research Assistant, Sogang University **2005**

Teaching Experience

Guest Lecture, Purdue University

Structural Causal Bandits (Advanced Machine Learning, Spring 2019), Counterfactual Bandits (Advanced Machine Learning, Spring 2019)

Graduate Teaching Assistant (Pennsylvania State University) Discrete Mathematics, Principles of Artificial Intelligence. (Iowa State University) Design and Analysis of Algorithms, Principles of Artificial Intelligence, Machine Learning, Object-Oriented Analysis and Design, Design and Analysis of Algorithms. (Sogang University) Java Language Programming, Personal Computer Laboratory I, Discrete Structures.

References

available on request

Last updated: February 12, 2020