

Sanghack Lee, Ph.D.

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| 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 Investigating 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, <i>Cum Laude</i> 2004 | |
| Publications | * for equally contributed authors. Sanghack Lee and Elias Bareinboim (2020). Characterizing Optimal Mixed Policies: Where to Intervene and What to Observe. In <i>Advances in Neural Information Processing Systems 33 (NeurIPS 2020)</i> (forthcoming) Sanghack Lee and Elias Bareinboim (2020). Causal Effect Identifiability under Partial Observability. In <i>Proceedings of the 37th International Conference on Machine Learning (ICML 2020)</i> Sanghack Lee , Juan D. Correa, and Elias Bareinboim (2020). General Transportability: Synthesizing Observations and Experiments from Heterogenous Domains. In <i>Proceedings of Thirty-fourth Conference on AAAI Conference on Artificial Intelligence (AAAI 2020)</i> Sanghack Lee , Juan D. Correa, and Elias Bareinboim (2019). General Identifiability with Arbitrary Surrogate Experiments. In <i>Proceedings of Thirty-fifth Conference on Uncertainty in Artificial Intelligence (UAI 2019)</i> Best Paper Award Sanghack Lee and Vasant Honavar (2019). Towards Robust Relational Causal Discovery . In <i>Proceedings of Thirty-fifth Conference on Uncertainty in Artificial Intelligence (UAI 2019)</i> Aria Khademi, Sanghack Lee , David Foley, Vasant Honavar (2019). Fairness in Algorithmic Decision Making: An Excursion Through the Lens of Causality. In <i>Proceedings of 2019 International Conference on World-Wide Web (WWW 2019)</i> Sanghack Lee and Elias Bareinboim (2019). Structural Causal Bandits with Non-manipulable Variables. In <i>Proceedings of Thirty-third AAAI Conference on Artificial Intelligence (AAAI 2019)</i> Sanghack Lee and Elias Bareinboim (2018). Structural Causal Bandits: Where to Intervene?. In <i>Advances in Neural Information Processing Systems 31 (NeurIPS 2018)</i> Sanghack Lee and Vasant Honavar (2017). Self-Discrepancy Conditional Independence Test. In <i>Proceedings of Thirty-third Conference on Uncertainty in Artificial Intelligence (UAI 2017)</i> | |

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 (NeurIPS 2013)*, 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

- Summer AI Seminar Series at POSTECH (Aug, 2020) (Pohang, South Korea), invited talk
- ICML'2020 (Virtual), poster
- 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

- 2021 ICLR, AAAI, AISTATS
- 2020 NeurIPS, UAI, ICML ([Top Reviewer Award](#)), AAAI, AISTATS, TPAMI
- 2019 NeurIPS ([Best Reviewer Award](#)), JMLR, WHY
- 2017 Causality Workshop at UAI
- 2016 ACM CHI
- 2014 ACM TIST Special Issue on Causal Discovery and Inference

External Reviews

- FODS 2020, Statistical Science, IJCAI 2019, ICML 2019, NeurIPS 2018

Industrial Experience

Senior Engineer at **Diquet, 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

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