Sanghack Lee, Ph.D. Associate Research Scientist

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RESEARCH INTERESTS

Sequential Decision Making Problems from the Aspect of Causality, Causal Inference and Causal Discovery in a Propositional or Relational Setting.

EDUCATION

The Pennsylvania State University, University Park, PA, United States

> Ph.D., College of Information Sciences and Technology **Spring 2018**

Iowa State University, Ames, IA, United States

> Ph.D. student (transferred), Computer Science **July 2013**

Sogang University, Seoul, South Korea

> MS., Computer Science and Engineering **February 2006**

> BE., Computer Science and Engineering, *Cum Laude* **February 2004**

PUBLICATIONS

∗ for equally contributed authors.

<u>Sanghack Lee</u>, 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)*

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

Aria Khademi, <u>Sanghack Lee</u>, 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)*

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

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

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

<u>Sanghack Lee</u> 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)*

<u>Sanghack Lee</u> 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, <u>Sanghack Lee</u>, 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

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

<u>Sanghack Lee</u> 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*[1] and Vasant Honavar (2013). Learning Classifiers from Distributional Data. In IEEE Second International Congress on Big Data. 302–309

PROFESSIONAL SERVICE

Journal of Machine Learning Research (JMLR), NeurIPS-19 (Reviewer), IJCAI-19 (External Reviewer), WHY-19 (Program Committee), ACM CHI'16 (Reviewer), Causality Workshop at UAI 2017 (Program Committee), ACM TIST Special Issue on Causal Discovery and Inference 2014 (Reviewer), NuerIPS 2018 (Subreviewer), ICML 2019 (Subreviewer)

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate at **Purdue University**, West Lafayette, USA **April 2018 to June 2019**
    Research on Causal Inference
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	**2015 – 2018**

Developed models and algorithms for representing causal knowledge in a relational domain

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

Developed algorithms for inference of causal effects given observational and experimental distributions

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

Studied eliciting causal effects given observational and experimental distributions

Research Assistant, Sogang University	**2005**

Developed an algorithm for feature subset selection, which is a part of research project for building a system software imitating ecosystem.

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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[1]Authors (*) contributed equally.