Jaehyeok Shin

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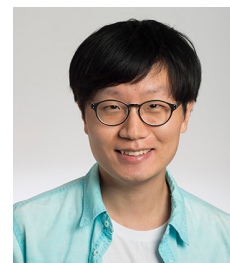
Research summary

My research interest lies in understanding the sequential and adaptive nature of data analysis. I study how commonly used statistical inference procedures behave under the presence of an analyst's data-dependent choices. My current projects focus on designing and analyzing nonasymptotic sequential testings and online change-point detection procedures.

During the Ph.D., my thesis's focus was to qualitatively and quantitatively measure the selection bias caused by different sorts of human interventions in settings of adaptive experimentation like multi-armed bandits, advised by Aaditya Ramdas and Alessandro Rinaldo. I have also worked extensively with Larry Wasserman to understand the geometrical and topological structure of data-generating processes.

Academic Appointment

July 2020 - Present	**Postdoctoral Researcher**, Carnegie Mellon University, Department of Statistics
December 2013 - December 2014	**Statistical Consultant - Part Time**, SNU Statistical Research Institute

Education

May 2020	**Ph.D. in Statistics**, Carnegie Mellon University
February 2015	**M.S. in Statistics**, Seoul National University
February 2013	**B.S. in Mathematical Sciences**, Seoul National University

Publications

2020   On conditional versus marginal bias in multi-armed bandits
J. Shin, A. Ramdas, A. Rinaldo
Thirty-seventh International Conference on Machine Learning (ICML 2020)

2020   Homotopy Reconstruction via the Cech Complex and the Rips Complex
J. Kim, J. Shin, F. Chazal, A. Rinaldo, L. Wasserman
Symposium on Computational Geometry (SoCG 2020)

2019   Are sample means in multi-armed bandits positively or negatively biased?
J. Shin, A. Ramdas, A. Rinaldo
Neural Information Processing Systems (NeurIPS 2019, Spotlight)

2019   Uniform Convergence Rate of the Kernel Density Estimator Adaptive to Intrinsic Dimension.
J. Kim, J. Shin, A. Rinaldo, L. Wasserman
Thirty-sixth International Conference on Machine Learning (ICML 2019)

Preprints

(arXiv)   On the bias, risk and consistency of sample means in multi-armed bandits
J. Shin, A. Ramdas, A. Rinaldo
Submitted to Sequential Analysis

(arXiv)   Predictive clustering
J. Shin, A. Rinaldo, L. Wasserman
Submitted to Electronic Journal of Statistics

Presentations

2020   On conditional versus marginal bias in multi-armed bandits (ICML 2020)
2019   Are sample means in multi-armed bandits positively or negatively biased? (NeurIPS 2019, Spotlight)
2018   Persistent homology of KDE filtration on Rips complex (SIAM-SEAS 2018)
2017   Persistent homology of KDE filtration on Rips complex (NIPS 2017 Workshop)

Peer review service

Neural Information Processing Systems (2020)
Conference on Algorithmic Learning Theory (2020)
Conference on Learning Theory (2019)

Academic Experience

2015 - 2019   **Teaching Assistant**, Carnegie Mellon University
- Advanced Statistical Theory I, Spring 2019
- Advanced Statistical Theory, Fall 2018
- Advanced Methods for Data Analysis, Spring 2018
- Modern Regression, Fall 2017
- Special Topics: Data Mining, Spring 2017
- Modern Regression, Fall 2016
- Advanced Methods for Data Analysis, Spring 2016
- Introduction to Probability Theory, Fall 2015

2013 - 2014   **Teaching Assistant**, Seoul National University
- Statistics, Fall 2014
- Mathematical Statistics 2, Fall 2013
- Statistics, Spring 2013

Fall 2014   **Academic Seminars**, Seoul National University
- Organized lab seminars on deep learning
- Lectured a seminar on stacked auto-encoder and its simulation results

2014   **Statistical Consulting**, SNU Statistical Research Institute
- Analyzed risk factors for failure of cataract surgery in dogs
- Develop a statistical model to predict future water pipe ruptures in Seoul

Spring 2011   **Undergraduate Tutor**, Seoul National University
- Tutored first-year overseas Korean students
- Taught elementary calculus class twice a week

Honors and Awards

Spring 2014	Academic Excellence Prize, **Seoul National University**
2011 - 2012	National Scholarship For Science and Engineering
2007 - 2008	National Scholarship For Science and Engineering

Community service

2016-Present	Served as a teacher of church youth group
2011	Served as a SNU Christian students union manager
2009 - 2010	Served as a military police in Korea army