HEEJONG BONG

Postdoctoral Research Fellow
Department of Statistics
University of Michigan, Ann Arbor, MI, USA
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RESEARCH INTERESTS

Causal inference, Network data analysis, High-dimensional central limit theorem and bootstrap, Graphical models, Ranking from pairwise comparisons

ACADEMIC POSITIONS

University of Michigan Ann Arbor, MI
Postdoctoral Research Fellow 2023 - Current
Collaborators: *Elizaveta Levina*, *Ji Zhu* and *Colin B. Fogarty*

Carnegie Mellon University Pittsburgh, PA
Postdoctoral Research Fellow 2022 - 2023
Collaborators: *Robert E. Kass*, *Valérie Ventura*, *Larry Wasserman*, *Alessandro Rinaldo* and *Arun K. Kuchibhotla*

EDUCATION

Carnegie Mellon University Pittsburgh, PA
Ph.D. in Statistics and Data Science 2017 - 2022
Dissertation: *Discovery of Functional Predictivity across Brain Regions from Local Field Potentials*
Dissertation advisors: *Robert E. Kass* and *Valérie Ventura*

Seoul National University Seoul, Republic of Korea
B.Sc. in Mathematics 2011 - 2017

PUBLICATIONS

Published / Accepted

Bong, H., Ventura, V. & Wasserman, L. (2024+). Frequentist Inference for Semi-Mechanistic Epidemic Models with Interventions. *arXiv preprint arXiv:2309.10792.* Forthcoming in the *Journal of the Royal Statistical Society Series B: Statistical Methodology*.

Kass, R. E., **Bong, H.**, Olarinre, M., Xin, Q. & Urban, K. (2023). Identification of Interacting Neural Populations from Multiple-Electrode Recordings. *Journal of Neurophysiology, 130*(3), 475-496.

Urban, K., **Bong, H.**, Orellana, J. & Kass, R. E. (2023). Oscillating neural circuits: Phase, amplitude, and the complex normal distribution. *Canadian Journal of Statistics, 51*(3), 824-851.

Bong, H., Ventura, V. & Wasserman, L. (2023). Heejong Bong, Valerie Ventura and Larry Wasserman's contribution to the Discussion of 'The Second Discussion Meeting on Statistical aspects of the Covid-19 Pandemic'. *Journal of the Royal Statistical Society Series A: Statistics in Society, 186*(4), 645-646.

Bong, H. & Rinaldo, A. (2022). Generalized results for the existence and consistency of the MLE in the Bradley-Terry-Luce model. In *International Conference on Machine Learning* (pp. 2160-2177). PMLR. Selected for long presentation.

Bong, H., Liu, Z., Ren, Z., Smith, M., Ventura, V. & Kass, R. E. (2020). Latent dynamic factor analysis of high-dimensional neural recordings. *Advances in Neural Information Processing Systems, 33,* 16446-16456. Poster presented.

Bong, H., Li, W., Shrotriya, S. & Rinaldo, A. (2020). Nonparametric estimation in the dynamic Bradley-Terry model. In *International Conference on Artificial Intelligence and Statistics* (pp. 3317-3326). PMLR. Poster presented.

Preprints

Bong, H., Fogarty, C. B., Levina, E., & Zhu, J. (2024+). Heterogeneous Treatment Effects under Network Interference: A Nonparametric Approach Based on Node Connectivity. *arXiv preprint:2410.11797.*

Bong, H., Ventura, V. & Wasserman, L. (2024+). Addressing the Null Paradox in Epidemic Models: Correcting for Collider Bias in Causal Inference. *arXiv preprint:2410.11743.*

Liu, Z.*, **Bong, H.***, Ren, Z., Smith, M. A. & Kass, R. E. (2024+). Simultaneous Inference in Multiple Matrix-Variate Graphs for High-Dimensional Neural Recordings. *arXiv preprint:2410.15530.* Submitted to the *Journal of the American Statistical Association.* [1]

Bong, H., Kuchibhotla, A. K. & Rinaldo, A. (2024+). Dual Induction CLT for High-dimensional m-dependent Data. *arXiv preprint arXiv:2306.14299.* Major revision invited for the *Annals of Statistics.*

Bong, H. & Kuchibhotla, A. K. (2024+). Tight Concentration Inequality for sub-Weibull Random Variables with Generalized Bernstien Orlicz norms. *arXiv preprint arXiv:2302.03850.*

Bong, H., Ventura, V., Yttri, E. A., Smith, M. A. & Kass, R. E. (2024+). Cross-Population Amplitude Coupling in High-Dimensional Oscillatory Neural Time Series. *arXiv preprint arXiv:2105.03508.*

PRESENTATIONS

Invited Talks

Banff Workshop on Causal Inference and Prediction for Network Data Banff, AB, Canada
Banff International Research Station 2024
Doubly Robust Non-parametric Estimation of Causal Effects under Network Interference

International Conference of the ERCIM WG on Computational and Methodological Statistics Berlin, Germany
HTW Berlin, University of Applied Sciences 2023
Tight concentration inequality for sub-Weibull random variables with variance constraints

Department of Mathematics Seoul, Korea
Korean Institute for Advanced Study 2023
Dual Induction CLT for High-dimensional m-dependent Data

[1] The starred authors contributed equally to this work.

Department of Brain and Cognitive Sciences Seoul, Korea
Seoul National University 2023
Discovery of functional predictivity across brain regions from local field potentials

Center for AI and Natural Sciences Seoul, Korea
Korean Institute for Advanced Study 2022
Discovery of functional predictivity across brain regions from local field potentials

Contributed Talks

Michael Woodroofe Memorial Conference Ann Arbor, MI
University of Michigan 2023
Dual Induction CLT for High-dimensional m-dependent Data

Carnegie Mellon Sports Analytics Conference Pittsburgh, PA
Carnegie Mellon University 2019
Time-Varying Bradley Terry Ranking Model with Penalized Estimation

Ninth International Workshop Statistical Analysis of Neuronal Data Pittsburgh, PA
Carnegie Mellon University 2019
Linear Factor Model for Discovering Lead-Lag Relationship between Two Brain Areas

AWARDS

1st Place in Reproducible Research Paper Competition, Carnegie Mellon Sports Analytics Conference 2019
Undergraduate Research Project Fellowship, Seoul National University ($3,000) 2016
Korea National Scholarship for Science and Engineering ($10,000 per year) 2011-2012,2015-2016

SOFTWARE PACKAGES

KECENI
Kernel Estimation of Causal Effects under Network Interference, Python 2024

FreqEpid
Frequentist Inferecne for Semi-Mechanistic Epidemic Models with Interventions, Python 2024

MMGE
Multiple Matrix-variate Graph Estimation, R 2022

LaDynS
Latent Dynamic Analysis via Sparse Banded Graphs, Python 2021

LDFA-H
Latent Dynamic Factor Analysis for High-dimensional Time Series, Python 2020

TEACHING EXPERIENCE

Teaching Assistant

Department of Statistics and Data Science Pittsburgh, PA
Carnegie Mellon University 2017-2022

Graduate level: *Advanced Statistical Theory, Intermediate Statistics, Probability and Mathematical Statistics*
Undergraduate level: *Undergraduate Advanced Data Analysis, Probability Theory and Random Processes, Probability Theory for Computer Scientists, Introduction to Probability Theory (2X), Introduction to Statistical Inference*

Department of Mathematics Seoul, Republic of Korea
Seoul National University 2017

Undergraduate level: *Sets and Mathematical Logics*

Tutor

Department of Mathematics Seoul, Republic of Korea
Seoul National University 2015

Undergraduate level: *Calculus for Life Science 1*

Undergraduate Student Assembly, Department of Mathematcis Seoul, Republic of Korea
Seoul National University 2015

Undergraduate level: *Introduction to Mathematical Analysis 1, 2*

SERVICE

DEI Committee Ann Arbor, MI
Department of Statistics, University of Michigan 2023-current

Journal Reviewer 2022-present

Journal of the American Statistical Association
Journal of the Royal Statistical Society, Series B