Junyoung Park

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Research Interests

My research primarily focuses on compositional data analysis, including variable selection, representation learning, and dimensionality reduction. The methods I am interested in using are kernel conditional mean embeddings, conditional covariance operators, autoencoders, and neural networks.

Education

Ph.D. candidate in Mathematical Sciences 2018–2024
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea
Advisors: Cheolwoo Park, Jeongyoun Ahn

B.S. in Mathematics 2013–2018
Korea University, Seoul, Korea

Publications

1. **Park, J.**, Ahn, J., and Park, C. (2023), Kernel Sufficient Dimension Reduction and Variable Selection for Compositional Data, Proceedings of the 40th International Conference on Machine Learning (**ICML**), link.
2. Kang, I., Choi, H., Yoon, Y.-J., **Park, J.**, Kwon, S.-S., and Park, C. (2023), Frechet Distance-Based Cluster Analysis for Multi-Dimensional Functional Data, Statistics and Computing, 33(4), 75.
3. **Park, J.**, Yoon, C., Park, C., and Ahn, J. (2022), Kernel Methods for Radial Transformed Compositional Data with Many Zeros, Proceedings of the 39th International Conference on Machine Learning (**ICML**), 162: 17458 - 17472, link.

Teaching

- **Teaching Assistant** at KAIST
  - Statistical Data Science Practice (DS516) Spring 2023
  - Probability and Statistics (MAS250) Fall 2021
  - Abstract Algebra I (MAS311) Spring 2021
  - Mathematical Statistics (MAS355) Fall 2019
  - Matrix Group Theory (MAS435) Spring 2019
    - Delivered an English lecture on connectedness of Lie groups.
  - Abstract Algebra II (MAS312) Fall 2018
    - Delivered most group-based lectures throughout the semester.

Skills

- Python, Matlab, R
- Optimization with Tensorflow
- Parallel programming

Languages

- Korean (native)
- English

Talks

- **2023 Summer Conference, the Korean Statistical Society**, Pukyong National University, Busan, Korea 2023
  Title: Kernel sufficient dimension reduction and variable selection for compositional data
- **2022 Fall KAIST Math Graduate student Seminar(KMGS)**, KAIST, Daejeon, Korea 2022
  Title: Kernel methods for radial transformed compositional data with many zeros
- **2022 Summer Conference, the Korean Statistical Society**, Seoul National University, Seoul, Korea 2022
  Title: Kernel methods for radial transformed compositional data with many zeros

Awards and Grants

- Presentation Award for Graduate Students, 2nd place, Korean Statistical Society (KSS) 2022
- University Students Contest of Mathematics, Silver Awards, Korean Mathematical Society (KMS) 2016, 2017
- Presidential Science Undergraduate Fellowship, fully funded for 8 semesters 2013–2018
- Korean Mathematical Olympiad (KMO) 2nd round of middle school division, Gold Awards 2009

Selected Graduate Coursework

- Categories: related to algebraic geometry, complex geometry, real/complex analysis.
  - Algebraic Geometry I, II
  - Algebraic Topology I, II
  - Local Analytic Geometry
  - Hodge Theory
  - Number Theory

Experience

Research in Algebraic Geometry KAIST
Studied algebraic geometry under the supervision of Prof. Sijong Kwak 2018–2021

- Projective geometry, syzygies, applied algebraic geometry.

Max Planck Institute for Mathematics in the Sciences Leipzig, Germany
Visiting research student Summer 2019

- Summer School on Randomness and Learning in Non-Linear Algebra

University Financial Engineering Association (U.FE.A) Seoul, Korea
Team leader 2016–2017

- Led Master's-level financial engineering studies
- Studied stochastic modeling and hedge (pricing) theory of various equity, interest rate derivatives. Example reference: Paul Wilmott on Quantitative Finance