

Alexander Kagan

323 West Hall, 1085 South University Ave, Ann Arbor, MI 48109

☎ (217) 778-5116 | ✉ amkagan@umich.edu | 🏠 alexanderkagan.github.io | 🗣 AlexanderKagan | 🌐 KaganAlex

Research Interests

My interests lie broadly in the intersection of **statistical network analysis** and **bioinformatics**, with primary focus on:

- Modeling shared and group latent structures in collections of networks with applications to neuroscience
- Modeling of information diffusion on networks with applications to epidemiology and influence maximization
- Cross-validation and model selection in network-assisted regression problems
- Hierarchical feature selection in supervised and semi-supervised settings with applications to biomarker discovery

Education

University of Michigan

PH.D. IN STATISTICS (CO-ADVISED BY PROF. ELIZAVETA LEVINA AND PROF. JI ZHU)

Ann Arbor, MI, USA

2021 - 2026 (expected)

Skolkovo Institute of Science and Technology

M.S. IN COMPUTER SCIENCE

Moscow, Russia

2020 - 2021

Yandex School of Data Analysis

M.S. EQUIVALENT CERTIFICATE IN DATA SCIENCE

Moscow, Russia

2019 - 2021

National Research University Higher School of Economics

B.S. IN MATHEMATICS (SUMMA CUM LAUDE)

Moscow, Russia

2016 - 2020

Work Experience

Sanofi

R&D COMPUTATIONAL SCIENCE INTERN (ADVISED BY PROF. ZIV BAR-JOSEPH)

Cambridge, MA, USA

Summer 2024

- Developed statistical tools based on Temporal Graph Neural Networks for discovering new biomarkers governing the patient's recovery process, with applications to psoriasis and Crohn's disease

Kirshner Lab, Harvard Medical School

RESEARCH ASSISTANT (ADVISED BY PROF. LEONID PESHKIN)

Cambridge, MA, USA

January 2021 - April 2024

- Developed a universal *Kinome Regularization* framework for detecting kinases governing a given phenotype
- Built a deep-learning framework for automatic detection and annotation of cell organelles in liver images
- Led a group of 3 MSc students developing supervised hierarchical variable selection methods for bulk & single-cell data

MRM Proteomics

RESEARCH INTERN (ADVISED BY PROF. CHRISTOPH BORCHERS)

Montreal, QC, Canada

Summer 2021

- Developed dimension reduction techniques allowing robust extraction of cancer biomarkers from patients' proteomics and metabolomics measurements

Juicy Labs

JUNIOR DATA SCIENTIST

Moscow, Russia

July 2019 - February 2020

- Developed new credit scoring models using linear regression, random forest, and boosting

Publications

Published

1. Noe, M., Parisi, E., Rifat, S., Navitskis, L., Conway, D., Deshmukh, A., Kagan, A., Millward, D., Chung, E. (2024) Comparison of 1st Year and 3rd Year ECGs in Collegiate Athletes. [Journal of the American College of Cardiology](#)

Under Review

2. Kagan, A., Levina, E., Zhu, J. (2025+) Flexible Modeling of Influence Propagation through a Network with Statistical Guarantees. *Under review at JMLR*, [arXiv preprint](#) (Work received 4 poster awards in 2023)
3. Mathur, S., Kagan, A., Passaban, P., Mattoo, H., Hasanaj, E., Bar-Joseph, Z. (2025+) Temporal Foundation Models for Clinical Transcriptomics Data. *Under review at Bioinformatics*, [bioRxiv preprint](#)
4. Kagan, A., MacDonald, P., Levina, E., Zhu, J. (2025+) Latent Space Models for Grouped Multiplex Networks with Shared Structure. *Under review at JMLR*, [arXiv preprint](#) (Honorable mention for a poster at SNAB-2024)
5. Nano, M., Harwood, J., Kagan, A., Lukaszewicz, G., Kirschner, M., Peshkin, L., Montell, D. (2025+) Kinome Regression Identifies Critical Modulators of Cellular Resilience. *Under review at Frontiers in Pharmacology*, [bioRxiv preprint](#)

In Preparation

6. Kagan, A., Tang, T., Levina, E., Zhu, J. (2025+) Cross Validation for Network Regression. (Work will be presented at ICSDS-2025)
7. Kagan, A., Rata, S., Gruver, J. S., Trikoz, N., Lukyanov, A., Vultaggio, J., Ceribelli, M., Thomas, C., Gujral, T. S., Kirschner, M. W., Peshkin, L. (2025+) An Optimal Set of Inhibitors for Reverse Engineering via Kinase Regularization.
8. Kriukov, D., Efimov, E., Kagan, A., Peshkin, L. (2025+) On Universal Approach to Biological Age Estimation

Software

1. [InfluenceDiffusion](#) (2024)
PYPI Python package for estimation and uncertainty quantification of influence diffusion models on networks
2. [GroupMultiNeSS](#) (2025)
PYPI Python package for extraction of shared and group latent structures from a collection of multiplex networks

Presentations

CONTRIBUTED TALKS

- 2025 **ICSDS (International Conference on Statistics and Data Science)**, Seville, Spain
- 2024 **CMStatistics (Conference on Computational and Methodological Statistics)**, London, UK
- 2024 **JSM (Joint Statistical Meetings)**, Portland, OR, USA
- 2023 **JSM (Joint Statistical Meetings)**, Toronto, ON, Canada

POSTERS

- 2024 **SNAB workshop (Honorable mention)**, Nassau, Bahamas
- 2023 **Michael Woodroffe Memorial Conference (Honorable mention)**, Ann Arbor, MI, USA
- 2023 **SNAB workshop (Best poster award)**, Anchorage, AK, USA
- 2023 **ICSA Applied Statistics Symposium (Honorable mention)**, Ann Arbor, MI, USA
- 2023 **MSSISS Statistics Symposium (Best poster award)**, Ann Arbor, MI, USA

Teaching Experience

GRADUATE STUDENT INSTRUCTOR, UNIVERSITY OF MICHIGAN

- **Data Science 415: Data Mining and Statistical Learning** (upper undergraduate level) *Fall 2025*
Taught and prepared Python notebooks for lab sections (~20 students), graded homework and exams
- **Stats 485: Capstone Seminar** (upper undergraduate level) *Fall 2022*
Held office hours, graded data analysis reports.
- **Stats 250: Introduction to Statistics and Data Analysis** (lower undergraduate level) *Winter 2022*
Taught weekly lab sections (~40 students), held office hours, graded homework and exams.
- **Stats 426: Introduction to Theoretical Statistics** (upper undergraduate level) *Fall 2021*
Held office hours, graded homework and exams.

TEACHING ASSISTANT, HIGHER SCHOOL OF ECONOMICS, MOSCOW, RUSSIA

- **Machine Learning** (upper undergraduate level) *Winter 2020*
Designed and taught weekly lab sections (~30 students), graded homeworks.
- **Real Analysis** (lower undergraduate level) *2018 - 2019*
Held office hours, graded homeworks and exams.

Professional Service

- **Organizing Committee Chair of MSSISS Statistics Symposium** *2024-2025*
Received an [Outstanding Graduate Student Service Award](#) for chairing the organizing committee of [MSSISS](#), an annual statistics symposium for ~150 people at UMichigan. My responsibilities included: student and keynote speaker invitations, funding requests, catering, website maintenance, and booklet printing.
- **Levina-Zhu Research Group Admin** *2022-2025*
Responsible for the logistics of my advisors' research group: scheduled weekly reading group presentations, curated group's Google Drive, website, and networks literature database.
- **Organizing Volunteer at ICSA Statistics Symposium** *June 2023*
Helped participants with conference logistics and registration.

Computing Skills

Proficient in Python (Numpy, Pandas, Sklearn, Matplotlib, PyTorch, Scipy, NetworkX, JAX, CVXPY), R, and Matlab

Languages

English (fluent), Russian (native), German (upper-intermediate), French (intermediate), Hebrew (intermediate)