Tianyi (Michael) Chen

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EDUCATION

Johns Hopkins University *Baltimore, Maryland*
PhD student at Applied Math and Statistics Department Sep 2021 - Present

Johns Hopkins University *Baltimore, Maryland*
Master of Science in Engineering Statistics Major Aug 2019 - May 2021

Renmin University of China *Beijing, China*
Bachelor of Science Statistics Major Economics Statistics Minor Sep 2015 - June 2019

PUBLICATIONS AND PREPRINTS

Chen, T., Park, Y., Saad-Eldin, A., Lubberts, Z., Athreya, A., Pedigo, B.D., Vogelstein, J.T., Puppo, F., Silva, G.A., Muotri, A.R. and Yang, W., (2023). Discovering a change point in a time series of organoid networks via the iso-mirror. arXiv preprint arXiv:2303.04871.

Priebe, C. E., Shen, C., Huang, N., & **Chen, T.** (2021). A Simple Spectral Failure Mode for Graph Convolutional Networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

Wang, F., **Chen, T.**, Chang, Q., Kao, Y. W., Li, J., Chen, M., ... & Shia, B. C. (2021). Respiratory diseases are positively associated with PM2. 5 concentrations in different areas of Taiwan. *Plos one*, 16(4), e0249694.

Chen, T., Chen, Y., Gao, J., Gao, P., Moon, J. H., Ren, J., ... & Woolf, T. B. (2021). Machine Learning to Summarize and Provide Context for Sleep and Eating Schedules. *bioRxiv*, 2020-12.

ACADEMIC ACTIVITIES

Understanding Dynamics of Time Series of Graphs Oct 2021 – Present
https://arxiv.org/abs/2303.04871
Johns Hopkins University advised by Professor Carey Priebe, Zachary Lubberts and Avanti Athreya

- Conducted in-depth research on time series graphs and break point estimation, illustrated with a comprehensive example. Analyzed Organoid data and drafted the paper based on the findings.
- Key words: **Time Series of Graphs Modeling; Multidimensional Scaling; Segment Regression; Break Point Detection**

A Simple Spectral Failure Mode for Graph Convolutional Networks May 2020 – July 2021
https://ieeexplore.ieee.org/abstract/document/9513556
Johns Hopkins University advised by Professor Carey Priebe

- Conducted preliminary simulations using Adjacency Spectral Embedding to determine failure mode; collaborated to prove corresponding theoretical limit results.
- Key words: **Graph Embedding**; **Vertex Classification**

Study of People's Circadian Rhythm in Circular Statistics Mar 2020 – July 2021
https://www.biorxiv.org/content/10.1101/2020.12.31.424983v1
Johns Hopkins University advised by Professor Thomas Woolf

- Collaborated to design and construct study; coded Bayesian estimation of mixture Von Mises model with variational inference in R; processed and cleaned primary data; drafted paper as first author, “Machine Learning to Summarize and Provide Context for Sleep and Eating Schedules"
- Key words: **Circadian Rhythm**; **Mixture Von Mises Model**

Disease Mapping model in Spatial Statistics Jul 2018 - Feb 2021
https://journals.plos.org/plosone/article/authors?id=10.1371/journal.pone.0249694
Renmin University of China advised by Professor Yang Li

- Studied association between respiratory diseases' ER visit rates and PM2.5 with generative disease mapping model; double-checked results of model; drafted paper "Respiratory Diseases are Positively Associated with PM2.5 Concentrations in Different Areas of Taiwan".
- Key words: **PM2.5**; **Generative Disease Mapping Model**

SCORE & SII Algorithm in Community Detection Jul 2018 - Jan 2019
Renmin University of China advised by Professor Xing Wang

- Improved spectral clustering algorithm called SCORE by introducing new maximal eigenpair algorithm called SII; independently completed proof of improved version's statistical property.
- Key words: **Spectral Clustering**; **Maximal Eigenpair Algorithm**

TEACHING EXPERIENCE

Teaching Assistant at *Johns Hopkins University Applied Mathematics and Statistics Department*

- Course “Intro to Optimization” Spring 2020
- Course “Applied Statistics and Data Analysis” Fall 2020 Fall 2022
- Course “Applied Statistics and Data Analysis 2” Spring 2021
- Course “Statistics Theory” Fall 2021

TALKS

“Understanding swarm: manifold learning on spectral representation of time series of graphs.”
JHU Applied Math and Statistics department Student Seminar Oct 19 2021

“A simple example for understanding swarms.”
JHU Applied Math and Statistics department Student Seminar Oct 11 2022

AWARDS AND FELLOWSHIPS

Duncan Fund for attending 2022 Institute of Mathematical Statistics Annual Meeting in London Summer 2022
MINDS (Mathematical Institute of Data Science) Fellowship Spring 2022

SOCIAL ACTIVITIES

Helped organize and attended 7th and 9th International Forum on Statistics May 2016 - Jul 2018

Participated in "Mingde Data" Program, support program with selective recruiting process aimed at students with talents and interests in statistics Oct 2016 - Jun 2018

- Attended extracurricular lectures and learned application of statistics in Life Science, Artificial Intelligence, Finance, and Precision Marketing.
- Attended seminars at Doshisha University in Japan about public opinion surveys in Japan, text mining, and causal inference; finished report entitled "Text Analysis for Lines in Drama in the Yuan Dynasty".

INDUSTRY EXPERIENCE

Business Analysis Intern | Beijing Chuncui Travel Co., Ltd. *Beijing, China* Mar 2019 - Jun 2019

- Prepared and maintained daily data reports (Tableau and SQL).
- Analyzed and compared hotel prices on different platforms, helping to make pricing strategy.
- Presented reports to CEO.