Chunyin, SIU (Alex)

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Education

Cornell University, Ithaca, NY *2019 – present*
PhD Applied Mathematics
supervised by Prof Gennady Samorodnitsky

The Chinese University of Hong Kong, Hong Kong *2017 – 2019*
MPhil Mathematics
supervised by Prof Ronald Lui

The Chinese University of Hong Kong, Hong Kong *2013 – 2017*
BSc Mathematics
Minor in Economics

Research Interests

Random Topology, Topological Data Analysis, Network Analysis, Computational Geometry

Professional Experiences

Lawrence Berkeley National Laboratory *Summer 2023 – present*
affiliate hosted by Dr Dmitriy Morozov
develop statistical techniques to analyze the topological structures of zeolite crystals and dark matter distribution

Publications

** denotes entries with alphabetically listed authors.*

C. Siu, G. Samorodnitsky, C. Yu, and R. He. "The Asymptotics of the Expected Betti Numbers of Preferential Attachment Clique Complexes". Submitted to *Random Structures and Algorithms*.

C. Siu, G. Samorodnitsky, C. Yu, and A. Yao. "Detection of Small Holes by the Scale-Invariant Robust Density-Aware Distance (RDAD) Filtration". *Submitted to the Journal of Applied and Computational Topology*.

* C. Siu, and R. Strichartz. "Geometry and Laplacian on Discrete Magic Carpets". *Journal of Fractal Geometry*, 2023.

H. Law, C. Siu, and R. Lui. "Decomposition of Longitudinal Deformations via Beltrami Descriptors". *Journal of Scientific Computing*, 2021.

C. Siu, H.L. Chan, and R. Lui "Image Segmentation with Partial Convexity Shape Prior Using Discrete Conformality Structures". *SIAM Journal on Imaging Sciences*, 2020.

* J. Li, and C. Siu. "An Elementary Approach on Left-Orderability, Cables of Torus Knots and Dehn Surgery". Preprint.

Select Awards and Honors

Croucher Scholarship for Doctoral Study *2019/2020*
Sir Edward Youde Memorial Fellowship *2017/2018*

Presentations and Talks

"Discovery of Small Dense Topological Features from Datasets". Joint Statistical Meetings. Toronto, Canada, Aug 2023

"The Many Holes of Preferential Attachment". Geometry and Topology meet Data Analysis and Machine Learning. Northeastern University, MA, Jun 2023.

"Betti Numbers of Preferential Attachment Complexes" (poster). Randomness in Topology and its Applications. The University of Chicago, IL, Mar 2023.

"Detection of Small Topological Features by the Scale-Invariant Robust Density-Aware Distance (RDAD) Filtration". CUHK, Hong Kong, Jan 2023.

"Detection of Small Topological Features by the Scale-Invariant Robust Density-Aware Distance (RDAD) Filtration" (poster). Algebraic Topology, Methods, Computation and Science 10. Oxford University, Britain, Jun 2022.

"Antman Persistence: Detection of Small Holes with the Robust Density-Aware Distance (RDAD) Filtration" (poster). Bridging Applied and Quantitative Topology. Virtual, May 2022.

"All Holes Can Be Measured, But Some Holes Are Noisier Than Others" (poster). AATRN Poster Session. Virtual, Oct 2021.

Teaching Experiences

MATH 1920 Multivariable Calculus for Engineers, Cornell, head teaching assistant	*Spring 23*
MATH 1920 Multivariable Calculus for Engineers, Cornell, teaching assistant	*Fall 22*
MATH 2010 Advanced Calculus I, CUHK, teaching assistant	*Spring 17*
MATH 4060 Complex Analysis, CUHK, teaching assistant	*Fall 17*
EPYMT Number Theory and Cryptography, CUHK, teaching assistant	*Summer 17*
MATH 1510 Calculus for Engineers, CUHK, teaching assistant	*Spring 17*
MATH 1540 University Mathematics for Financial Studies, CUHK, teaching assistant	*Fall 16*

Mentorship Experiences

Rongyi He	*Summer 22 – Summer 23*
Luis Hoderlein	*Spring 22 – Summer 22*
Tom Shi	*Spring 22*
Andrey Yao	*Fall 20 – Spring 22*

Additional Information

Natural languages	English, Chinese (Cantonese, Mandarin)
Programing	MATLAB, Python, Bash, R