Personal information & current position

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Position: postdoctoral research fellow

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Experience

Postdoctoral researcher, Bar-Ilan University *2022.7 – present*

Education

Academy of Mathematics and Systems Science, Chinese Academy of Sciences *2016.9 - 2022.6*
Ph.D. in mathematics

University of Barcelona *2020.10 - 2021.12*
Ph.D. in mathematics

Nankai University *2012.9 - 2016.7*
B.G.S. in Mathematics, and Biology

Research interests

My research interests lie in set theory and mathematical logic. Now I aim to develop and leverage artificial intelligence for mathematical research.

Skills

Expertise and research experience in mathematical logic; familiar with Python, PyTorch, Reinforcement Learning and Large Language Models.

Projects

AI+Math (Ongoing)
Leading a project to enhance LLMs' mathematical reasoning via RL on diverse mathematical datasets. Demonstrated improved performance using a rule-based GRPO algorithm; currently exploring training efficiency and data scaling laws in mathematical tasks, which will lay a solid foundation for our next steps.

Participant of National Natural Science Foundation of China (No. 11871464): Forcing with large cardinal and its applications (2019.1-2022.12).
As a project participant, I conducted a comprehensive study on the cofinality of the least λ-strongly compact cardinal [1].

Joint PhD student at University of Barcelona, China Scholarship Council (2020.10-2021.12).
As a joint PhD student at University of Barcelona, I successfully separated almost strong compactness from strong compactness [2].

Postdoctoral researcher of ERC Starting grant, European Research Council (ERC-2018-StG 802756): Set theory beyond the first uncountable cardinal.
As a postdoctoral researcher of ERC Starting grant from July 2022 to September 2024, I made significant contributions to the study of finer large cardinals [5,6] and participated in the construction of full Souslin trees [3,4].

Publications

[1] On the cofinality of the least λ-strongly compact cardinal (with Jiachen Yuan),
Journal of Symbolic Logic, 2024. DOI: https://doi.org/10.1017/jsl.2023.4.
[2] How far is almost strong compactness from strong compactness (with Jiachen Yuan),
Journal of Mathematical Logic, to appear. DOI: https://doi.org/10.1142/S0219061324500090.
[3] Full Souslin trees at small cardinals (with Assaf Rinot and Shira Yadai),
Journal of the London Mathematical Society, 2024. DOI: https://doi.org/10.1112/jlms.12957.

Works submitted

[4] The vanishing levels of a tree (with Assaf Rinot and Shira Yadai), submitted 2024.
Preprint available at https://arxiv.org/abs/2309.03821.
[5] Ketonen's question and other sins (with Assaf Rinot and Jiachen Yuan), submitted 2024.
Preprint available at https://arxiv.org/abs/2408.01547.
[6] A new model in which all C-sequences are trivial (with Assaf Rinot and Jiachen Yuan), submitted.
Preprint available at https://arxiv.org/abs/2504.06794.

In preparation

[7] A note on intersection model, in preparation.

Reviews

Reviewed 1 manuscript for ***Archive for Mathematical Logic***.

Talks

I have delivered over 10 talks at international conferences and workshops, such as the Logic Colloquium 2023 (University of Milan, Italy) and the Annual Meeting of the Israel Mathematical Union 2022 (Ben-Gurion University of the Negev).

Conference Presentations

[1]. Minimal Magidor-type forcing (Countable case). Prikry Forcing Online: University of East Anglia, December 2020.
[2]. Hierarchies of δ-strongly but not full strongly compact cardinals. Logic workshop in Nanjing: Nanjing University, March 2021.

[3]. Hierarchies of δ-strongly compact cardinal. Annual meeting of The Israel Mathematical Union: Ben Gurion University of the Negev, Israel, September 2022.
[4]. How far is almost strong compactness from strong compactness. Logic Colloquium 2023: University of Milan, Italy, June 2023.
[5]. The vanishing level of a tree. Chinese Annual Conference on Mathematical Logic 2023: Sun Yat-sen University, China, November 2023.

Seminar Presentations
[1]. Hierarchies of δ-strongly but not full strongly compact cardinals. Barcelona Set Theory Seminar: University of Barcelona, September 2021.
[2]. Strong compactness and its variation. Mathematical Logic Seminar: Wuhan University, March 2022.
[3]. Identity crisis between δ-strongly compact cardinals. Tel Aviv University Set Theory Seminar: Tel Aviv University, Israel, September 2022.
[4]. Some new constructions of Suslin trees. Mathematical Logic Seminar: Wuhan University, China, October 2023.
[5]. Adding entangled branches to a κ-Suslin tree. Institute of Mathematics Set Theory Seminar: Chinese Academy of Sciences, China, November 2023.
[6]. The intersection of a sequence of outer models and sum ultrafilter constructions. Set Theory Seminar in Jerusalem: Hebrew University, Israel, May 2024.
[7]. What happens on the limit of a sequence of models of ZFC. Young Scholars Forum. Nanjing University. 2024.10