

**Kaiyu Yang**  
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<https://yangky11.github.io>

## PROFESSIONAL APPOINTMENTS

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**Meta Fundamental AI Research (FAIR)**  
*Research Scientist*

New York, NY  
6/2024 – Present

**California Institute of Technology**  
*Computing, Data, and Society Postdoctoral Fellow*

Pasadena, CA  
9/2022 – 5/2024

Advisors: Pietro Perona and Yisong Yue

## EDUCATION

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**Princeton University**  
*Ph.D. in Computer Science*

Princeton, NJ  
7/2022

Advisor: Jia Deng

**University of Michigan**  
*M.S. in Computer Science and Engineering*

Ann Arbor, MI  
8/2018

**Tsinghua University**  
*B.Eng. in Computer Science*  
*B.S. in Mathematics*

Beijing, China  
7/2016  
7/2016

## RESEARCH INTERESTS

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AI · Machine Learning · LLMs for Theorem Proving and Mathematical Reasoning

## PUBLICATIONS

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\* Equal contribution. † Equal advising

- Preprint      **Goedel-Prover-V2: Scaling Formal Theorem Proving with Scaffolded Data Synthesis and Self-Correction**  
Yong Lin\*, Shange Tang\*, Bohan Lyu\*, Ziran Yang\*, Jui-Hui Chung\*, Haoyu Zhao\*, Lai Jiang\*, Yihan Geng\*, Jiawei Ge, Jingruo Sun, Jiayun Wu, Jiri Gesi, Ximing Lu, David Acuna, Kaiyu Yang, Hongzhou Lin\*, Yejin Choi, Danqi Chen, Sanjeev Arora, Chi Jin\*.  
*In submission*, 2025
- Preprint      **Verina: Benchmarking Verifiable Code Generation**  
Zhe Ye, Zhengxu Yan, Timothe Kasriel, Jingxuan He, Kaiyu Yang, Dawn Song.  
*In submission*, 2025
- Preprint      **Spectral Journey: How Transformers Predict the Shortest Path**  
Andrew Cohen, Andrey Gromov, Kaiyu Yang, Yuandong Tian.  
*Preprint*, 2025

- COLM 2025 **Goedel-Prover: A Frontier Model for Open-Source Automated Theorem Proving**  
 Yong Lin\*, Shange Tang\*, Bohan Lyu, Jiayun Wu, Hongzhou Lin, Kaiyu Yang, Jia Li, Mengzhou Xia, Danqi Chen, Sanjeev Arora, Chi Jin.  
*Conference on Language Modeling*, 2025
- ICML 2025 **Formal Mathematical Reasoning: A New Frontier in AI**  
 CACM 2025 Kaiyu Yang, Gabriel Poesia, Jingxuan He, Wenda Li, Kristin Lauter, Swarat Chaudhuri, Dawn Song.  
*International Conference on Machine Learning (Position Papers Track)*, 2025, **Spotlight**  
 A separate version accepted to *Communications of the ACM*
- CAV 2025 **PyEuclid: A Versatile Formal Plane Geometry System in Python**  
 Zhaoyu Li\*, Hangrui Bi\*, Jialiang Sun\*, Zenan Li, Kaiyu Yang, Xujie Si.  
*International Conference on Computer-Aided Verification (Tool Papers Track)*, 2025
- ICLR 2025 **Proving Olympiad Inequalities by Synergizing LLMs and Symbolic Reasoning**  
 Zenan Li\*, Zhaoyu Li\*, Wen Tang, Xian Zhang, Yuan Yao, Xujie Si, Fan Yang, Kaiyu Yang<sup>†</sup>, Xiaoxing Ma<sup>†</sup>.  
*International Conference on Learning Representations*, 2025
- NeuS 2025 **Lean Copilot: Large Language Models as Copilots for Theorem Proving in Lean**  
 Peiyang Song, Kaiyu Yang, Anima Anandkumar.  
*International Conference on Neuro-symbolic Systems*, 2025
- NeurIPS 2024 **SciInstruct: A Self-Reflective Instruction Annotated Dataset for Training Scientific Language Models**  
 Dan Zhang, Ziniu Hu, Sining Zhoubian, Zhengxiao Du, Kaiyu Yang, Zihan Wang, Yisong Yue, Yuxiao Dong, Jie Tang.  
*Conference on Neural Information Processing Systems (Datasets & Benchmarks Track)*, 2024
- COLM 2024 **A Survey on Deep Learning for Theorem Proving**  
 Zhaoyu Li, Jialiang Sun, Logan Murphy, Qidong Su, Zenan Li, Xian Zhang, Kaiyu Yang, Xujie Si.  
*Conference on Language Modeling*, 2024
- ICML 2024 **Autoformalizing Euclidean Geometry**  
 Logan Murphy\*, Kaiyu Yang\*, Jialiang Sun, Zhaoyu Li, Anima Anandkumar, Xujie Si.  
*International Conference on Machine Learning*, 2024
- NeurIPS 2023 **LeanDojo: Theorem Proving with Retrieval-Augmented Language Models**  
Kaiyu Yang, Aidan Swope, Alex Gu, Rahul Chalamala, Peiyang Song, Shixing Yu, Saad Godil, Ryan Prenger, Anima Anandkumar.  
*Conference on Neural Information Processing Systems (Datasets & Benchmarks Track)*, 2023, **Oral presentation**
- CVPR 2023 **Infinite Photorealistic Worlds using Procedural Generation**  
 Alexander Raistrick\*, Lahav Lipson\*, Zeyu Ma\*, Lingjie Mei, Mingzhe Wang, Yiming Zuo, Karhan Kayan, Hongyu Wen, Beining Han, Yihan Wang, Alejandro Newell, Hei Law, Ankit Goyal, Kaiyu Yang, Jia Deng.  
*Conference on Computer Vision and Pattern Recognition*, 2023
- TMLR 2023 **Learning Symbolic Rules for Reasoning in Quasi-Natural Language**  
Kaiyu Yang and Jia Deng.  
*Transactions on Machine Learning Research*, 2023

- EMNLP 2022    **Generating Natural Language Proofs with Verifier-Guided Search**  
Kaiyu Yang, Jia Deng, Danqi Chen.  
*Conference on Empirical Methods in Natural Language Processing*, 2022, **Oral presentation**
- ICML 2022    **A Study of Face Obfuscation in ImageNet**  
Kaiyu Yang, Jacqueline Yau, Li Fei-Fei, Jia Deng, Olga Russakovsky.  
*International Conference on Machine Learning*, 2022
- NeurIPS 2020    **Strongly Incremental Constituency Parsing with Graph Neural Networks**  
Kaiyu Yang and Jia Deng.  
*Conference on Neural Information Processing Systems*, 2020
- NeurIPS 2020    **Rel3D: A Minimally Contrastive Benchmark for Grounding Spatial Relations in 3D**  
Ankit Goyal, Kaiyu Yang, Dawei Yang, Jia Deng.  
*Conference on Neural Information Processing Systems*, 2020, **Spotlight**
- FAT\* 2020    **Towards Fairer Datasets: Filtering and Balancing the Distribution of the People Subtree in the ImageNet Hierarchy**  
Kaiyu Yang, Klint Qinami, Li Fei-Fei, Jia Deng, Olga Russakovsky.  
*Conference on Fairness, Accountability, and Transparency*, 2020
- ICML 2019    **Learning to Prove Theorems via Interacting with Proof Assistants**  
Kaiyu Yang and Jia Deng.  
*International Conference on Machine Learning*, 2019
- ICCV 2019    **SpatialSense: An Adversarially Crowdsourced Benchmark for Spatial Relation Recognition**  
Kaiyu Yang, Olga Russakovsky, Jia Deng.  
*International Conference on Computer Vision*, 2019
- ECCV 2016    **Stacked Hourglass Networks for Human Pose Estimation**  
Alejandro Newell, Kaiyu Yang, Jia Deng.  
*European Conference on Computer Vision*, 2016

## AWARDS AND GRANTS

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- Neurosymbolic AI for Autonomy** 2023  
*Co-authored proposal awarded by Caltech's Center for Autonomous Systems and Technologies*
- Siebel Scholar** 2022  
*42 computer science graduate students awarded annually from selected institutions worldwide*
- Outstanding Reviewer** 2020, 2021  
*Top 20% at the Conference on Computer Vision and Pattern Recognition (CVPR)*
- Google Cloud Research Credits** 2019  
*Google Cloud Platform*
- Outstanding Teaching Assistant Award** 2015, 2016  
*Tsinghua University*

## MEDIA

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- Mathematicians' Newest Assistants Are Artificially Intelligent** 2024  
*Scientific American*
- Can LLMs Generate Mathematical Proofs that can be Rigorously Checked?** 2023  
*MarkTechPost*
- Exploring the Tradeoff Between Privacy and Algorithm Performance** 2022

<i>Princeton Insights</i>	
<b>Researchers Devise Approach to Reduce Biases in Computer Vision Data Sets</b>	2020
<i>Princeton Engineering News</i>	
<b>AI Is Biased. Here's How Scientists Are Trying to Fix It</b>	2019
<i>Wired</i>	

## INVITED TALKS

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### Formal Reasoning Meets LLMs: Towards AI for Mathematics and Verification

University of Southern California	11/2025
Duke University	10/2025
Georgia Institute of Technology	4/2025
ICERM, Brown University	4/2025
Simons Institute for the Theory of Computing	4/2025
University of California, Berkeley	4/2025
Rutgers University	4/2025

### Towards an AI Mathematician

Brown University	9/2024
University of California, Los Angeles	5/2024
University of Chicago	4/2024
Meta FAIR	4/2024
University of Texas, Austin	3/2024

### Towards Large Language Models as Copilots for Theorem Proving

Lean Together Annual Meeting	1/2024
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### Theorem Proving via Machine Learning

Lean for the Curious Mathematician Colloquium	9/2023
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### LeanDojo: Theorem Proving with Retrieval-Augmented Language Models

Conference on Neural Information Processing Systems (NeurIPS) Oral Presentation	12/2023
Stanford Software Research Lunch	10/2023
Conference on Artificial Intelligence and Theorem Proving (AITP)	9/2023
Hoskinson Center for Formal Mathematics, CMU	5/2023
Rutgers University	7/2023

### Neurosymbolic Reasoning, From Formal Logic to Natural Language

University of California, Los Angeles	2/2023
University of California, Santa Barbara	11/2022
University of Southern California	10/2022

### Teaching Machines to Reason Symbolically

OpenAI	3/2022
Google	2/2022
University of Pennsylvania	2/2022
NSF Expeditions "Understanding the World Through Code"	1/2022
Caltech	1/2022

### Generating Natural Language Proofs with Verifier-Guided Search

N2Formal Group, Google	7/2022
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## RESEARCH MENTORING

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<b>Zhaoyu Li</b> <i>PhD student @ U of Toronto</i>	2025 – Present
<b>Jiacheng Chen</b> <i>Undergrad @ South China University of Technology → PhD student @ CUHK</i>	2024 – 2025
<b>Peiyang Song</b> <i>Undergrad @ UCSB → Undergraduate @ Caltech</i>	2023 – 2024
<b>Rahul Chalamala</b> <i>Undergrad @ Caltech → Researcher @ Together AI</i>	2023
<b>Shixing Yu</b> <i>Master's student @ UT Austin → PhD student @ Cornell</i>	2022 – 2023
<b>Gene Chou</b> <i>Undergrad @ Princeton → PhD student @ Cornell</i>	2021
<b>Jacqueline Yau</b> <i>Master's student @ Stanford → PhD student @ UIUC</i>	2019 – 2020

## TEACHING EXPERIENCE

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<b>Advanced Large Language Model Agents</b> <i>Guest Co-instructor, UC Berkeley &amp; MOOC</i>	Spring 2025
<b>AIST 5030: Generative Artificial Intelligence</b> <i>Guest Lecturer, Chinese University of Hong Kong</i>	Spring 2025
<b>CS 159: Large Language Models for Reasoning</b> <i>Guest Lecturer, Caltech</i>	2024/5
<b>COS 484/584: Natural Language Processing</b> <i>Teaching Assistant, Princeton University</i>	2021/2 – 2021/5
<b>Data Structures and Algorithms</b> <i>Head Teaching Assistant, Tsinghua University</i>	2013/8 – 2016/7

## SERVICE

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### Organizer

The 5rd Workshop on Mathematical Reasoning and AI @ NeurIPS 2025  
The 3rd Workshop on Mathematical Reasoning and AI @ NeurIPS 2023  
Tutorial on Machine Learning for Theorem Proving @ NeurIPS 2023

### Area Chair

International Conference on Machine Learning (ICML), 2025  
European Conference on Computer Vision (ECCV), 2024

### Reviewer

National Science Foundation (NSF) Panel  
National Academies Workshop Proceedings: “AI to Assist Mathematical Reasoning”  
European Research Council (ERC) Advanced Grant  
International Conference on Machine Learning (ICML)  
Neural Information Processing Systems (NeurIPS)  
International Conference on Learning Representations (ICLR)  
Journal of Machine Learning Research (JMLR)  
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)  
Computer Vision and Pattern Recognition (CVPR)  
International Conference on Computer Vision (ICCV)  
European Conference on Computer Vision (ECCV)