Peiyang Song

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Education

6/2026 **California Institute of Technology** Pasadena, CA
B.S. in Computer Science & Minor in Robotics
Advisors: Prof. Steven Low & Prof. Günter Niemeyer. GPA: **4.2/4.0**

Research Interests

Machine Learning · Natural Language Processing · Automated Reasoning · Neuro-Symbolic AI

Work Experience

6/2024 – Present **Stanford University** Palo Alto, CA
Researcher @ Stanford AI Lab (SAIL) and Computation & Cognition Lab
Advisors: Prof. Noah Goodman (Stanford), Gabriel Poesia (Stanford)

2/2023 – Present **California Institute of Technology** Pasadena, CA
Research Fellow @ Anima AI+Science Lab
Advisors: Prof. Anima Anandkumar (Caltech), Dr. Kaiyu Yang (Meta)

11/2022 – 6/2024 **University of California, Santa Barbara** Santa Barbara, CA
Researcher @ Computer Architecture Lab (ArchLab)
Advisors: Prof. Timothy Sherwood (UCSB), Dr. Jeremy Lau (Google)

Selected Publications

Preprint **Towards Large Language Models as Copilots for Theorem Proving in Lean**
Peiyang Song, Kaiyu Yang, Anima Anandkumar
NeurIPS Mathematical Reasoning and AI (MATH-AI) Workshop, 2023

Preprint **Temporal Activation and Real-Soft-Max Functions**
Peiyang Song, Rhys Gretsch, Jeremy Lau, and Timothy Sherwood

In submission, manuscript available upon request

EMNLP 2024 **Creative and Context-Aware Translation of East Asian Idioms with GPT-4**
Kenan Tang*, Peiyang Song*, Yao Qin, Xifeng Yan (* Equal Contribution)
Findings of Empirical Methods in Natural Language Processing (EMNLP), 2024

EMNLP 2024 **In-Context Learning May Not Elicit Trustworthy Reasoning: A-Not-B Errors in Pretrained Language Models**
Pengrui Han*, Peiyang Song*, Haofei Yu, Jiaxuan You (* Equal Contribution)
Findings of Empirical Methods in Natural Language Processing (EMNLP), 2024

ASPLOS 2024 **Energy Efficient Convolution with Temporal Arithmetic**
Rhys Gretsch, Peiyang Song, Advait Madhavan, Jeremy Lau, Timothy Sherwood
ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 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
Neural Information Processing Systems (NeurIPS), 2023, **Oral presentation**

Awards & Honors

8/2023 **Early Research Scholarship**

4/2023 **Caltech SURF award**

9/2022 **UCSB Creative Studies Honors**

Selected Media

2024 **Mathematicians' Newest Assistants Are Artificially Intelligent**
Scientific American

2024 **LeanAgent: The First Life-Long Learning Agent for Formal Theorem Proving in Lean**
MarkTechPost

2024 **Lean Copilot: An AI Tool that Allows Large Language Models (LLMs) to be used in Lean for Proof Automation**
MarkTechPost

2023 **Can LLMs Generate Mathematical Proofs that can be Rigorously Checked?**
MarkTechPost

Languages

Programming Python, C++, Lean 4, Java, C, PASCAL, OCaml, C#

Natural English (TOEFL 117/120), Mandarin (Native)

Invited Talks & Tutorials

Tutorial: Neuro-Symbolic Theorem Proving with Lean

9/2024 3rd Neuro-Symbolic AI Summer School (NSSS)

Towards An AI Mathematician

12/2023 UC Santa Barbara NLP Lab
11/2023 CCS Research & Creative Activities Conference (RACA-CON)
8/2023 Caltech SURF Seminar Day

Academic Services

Reviewer Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Learning Representations (ICLR)
NeurIPS Mathematical Reasoning and AI (MATH-AI) Workshop
NeurIPS Workshop on Behavioral Machine Learning
ICLR VerifAI: AI Verification in the Wild Workshop
ICLR Workshop on Representational Alignment (Re-Align)
ICML Workshop on LLMs and Cognition