

# Haoliang Wang

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## Education

- 2019- *PhD*, Experimental Psychology, UC San Diego  
Advisors: Judith Fan
- Summer 2022 Neurosymbolic Programming Summer School
- 2019-2021 *MA*, Experimental Psychology, UC San Diego  
Advisors: Judith Fan
- 2015-2019 *BS*, Computer Science, Xi'an Jiaotong University  
Advisor: Pengju Ren  
Thesis: Spiking neural network learning algorithms based on temporal modulation.

## Selected Academic Honors and Awards

- 2022 Norman Anderson Graduate Travel and Research Award (\$1,500).
- 2018 PengKang Scholarship (top 1% students for academic excellence).
- 2017 Samsung Scholarship (top 2% students for academic excellence).  
The First Prize of Alumni Scholarship of Xi'an Jiaotong University (top 2% student for academic excellence).
- 2016 Outstanding Students in Xi'an Jiaotong University (top 5% students for academic excellence).  
The First Prize of Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM).

## Research Interests

**Computational Cognitive Science:** intuitive physics, theory acquisition, concept learning  
**Machine Learning:** program synthesis, representation learning, neural-symbolic models

## Publications

- \* indicates equal contribution
- 2023 **Wang\***, H., Jedoui\*, K., Venkatesh\*, R., Binder\*, F., Tenenbaum, J., Yamins, D., Fan, J., and Smith, K.. Modeling and evaluating how the brain makes physical predictions. *Neuroscience* 2023.
- 2023 Martinez, J., Binder, F., **Wang, H.**, Haber, N., Fan, J., and Yamins, D.. Measuring and Modeling Physical Intrinsic Motivation. *Proceedings of the 45th Annual Meeting of the Cognitive Science Society*.

- 2022 **Wang, H.**, Allen, K., Vul, E., and Fan, J.. Generalizing physical prediction by composing forces and objects. *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
- 2022 **Wang, H.**, Yang, J., Tamari, R., and Fan, J.. Communicating understanding of physical dynamics in natural language. *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
- 2022 Brockbank\*, E., **Wang\*, H.**, Yang, J., Mirchandani, S., Bıyık, E., Sadigh, D., and Fan, J.. How do people incorporate advice from artificial agents when making physical judgments? *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
- 2021 **Wang, H.**, Polikarpova, N., and Fan, J.. Learning part-based abstractions for visual object concepts. *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.
- 2021 **Wang, H.**, Vul, E., Polikarpova, N., and Fan, J.. Theory acquisition as constraint-based program synthesis. *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.
- 2021 McCarthy\*, W., Hawkins\*, R., **Wang, H.**, Holdaway, C., and Fan, J.. Learning to communicate about shared procedural abstractions. *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.
- 2020 **Wang, H.**, and Fan, J.. Library learning for structured object concepts. *ICML Workshop on Object-Oriented Learning: Perception, Representation, and Reasoning*.

## Conference Presentations

- 2023 Modeling and evaluating how the brain makes physical predictions. Poster presented at *Neuroscience 2023*.
- 2022 Generalizing physical prediction by composing forces and objects: Poster presented at *44th Annual Meeting of the Cognitive Science Society*.
- 2022 Communicating understanding of physical dynamics in natural language: Poster presented at *44th Annual Meeting of the Cognitive Science Society*.
- 2021 Learning part-based abstractions for visual object concepts: Poster presented at *43rd Annual Meeting of the Cognitive Science Society*.
- 2021 Theory acquisition as constraint-based program synthesis: Poster presented at *43rd Annual Meeting of the Cognitive Science Society*.
- 2020 Library learning for structured object concepts: Poster presented at *ICML Workshop on Object-Oriented Learning: Perception, Representation, and Reasoning*.

## Teaching Experience

### UC San Diego, Department of Psychology

- 2023 PSYCH 106 Behavioral Neuroscience
- 2022 PSYCH 102 Sensory Neuroscience
- 2021 PSYCH 105 Cognitive Psychology
- PSYCH 104 Social Psychology

2020 PSYCH 3 Foundations of Cognitive Psychology  
 2019 PSYCH 100 Clinical Psychology  
*Responsibilities: Guest lecture a class session, assist with exam preparation and teaching, grade written assignments, and hold weekly office hours.*

## Outreach

2021 Gave a talk on Bayesian reasoning and program synthesis to high school students in [Pathways2AI](#).

## Mentorship

2022- Nora Chen, Honors thesis student.  
 2021-2022 Jane Yang, Honors thesis student, now at UT Austin.

## Academic Service

2023 Reviewer of CogSci.

## Skills

Modelling and Analysis: Python, PyTorch, Julia, [Gen](#), R, MATLAB, C++  
 Experimental Design: JavaScript, HTML, CSS  
 Software and Tools: git, Adobe CC,  $\text{\LaTeX}$

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