Yiheng Xie

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Education

Ph.D. Computing & Mathematical Sciences, Caltech
- 2023 – 2028 (est.)

B.Sc. Computer Engineering, Brown University
- 2018 – 2022, *summa cum laude* (GPA: 3.97/4.0)

Research

Netlab *Graduate Researcher* (Caltech)   **2022 – Present**
- Deployed a campus-scale network of synchrophasors (PMUs) and controllable DERs.
- Developed a collection of production-grade software tools for real-time display, analysis, modeling, and control of energy resources.
- Deployed our software on cloud computing platforms with cybersecurity hardening.
- **Advisor**: Steven Low

HCRI Robotics Lab *Research Assistant* (Brown University)   **2019 – 2022**
- Proposed a sample-efficient and generalizable reinforcement learning agent. AAAI-RLG first author.
- Previously, produced a large-scale code repository, which implemented our group's paper – *Teaching a Robot Tasks of Arbitrary Complexity via Human Feedback* – on a real-world robot agent.
- **Advisor:** Michael L. Littman

Unity Technologies *Research Scientist* (Tel Aviv, Israel)   **2020 – 2022**
- Investigating 3D reconstruction and differentiable rendering techniques at the Digital Twin Group.
- Developed a production-ready geometry refinement algorithm via differentiable rasterization.

Brown Visual Computing *Project Lead* (Brown University)   **2021 – 2022**
- Leading 10 researchers across 5 institutions on review project: *Neural Fields in Visual Computing*.
- Published a 20-page review surveying 250+ papers and developed an open-source web database.
- **Advisors:** Srinath Sridhar (Brown University), Vincent Sitzmann (MIT)

Superfund Research Group *Research Assistant* (Brown University)   **2018 – 2020**
- Studied the mechanical properties of novel 2D nanomaterials. Proposed a novel research methodology: a computer vision algorithm for analyzing tensile testing data.
- **Advisor:** Robert H. Hurt

Publications

Learning Generalizable Behavior via Visual Rewrite Rules, <u>Yiheng Xie</u>, Shangqun Yu, Mingxuan Li and Michael Littman, AAAI-RLG Workshop, 2022

Neural Fields in Visual Computing and Beyond, <u>Yiheng Xie</u>, Towaki Takikawa, Shunsuke Saito, Or Litany, Shiqin Yan, Numair Khan, Federico Tombari, James Tompkin, Vincent Sitzmann and Srinath Sridhar, Eurographics State-of-the-Art Reports (STARs), 2022

Shear failure in supported two-dimensional nanosheet van der Waals thin films, Cintia Castilho, Dong Li, <u>Yiheng Xie</u>, Huajian Gao and Robert Hurt, *Carbon*, 2021

Teaching

ENGN 0040 Dynamics and Vibrations (Brown University)   **Summer 2021**
  - Hosted weekly office hours for homework and design projects.

CSCI 2952K 3D Computer Vision and Machine Learning (Brown University)   **Fall 2020**
  - Hosted weekly literature review workshops and handled grading for this graduate-level seminar.

ENGN 1580 Communication Systems (Brown University)   **Spring 2020**
  - Staff note-taker for this upper-level Computer Engineering elective.

Work Experience

AWS Ethos Hub *Part-time, Cloud Developer* (Providence, RI)   **2021 – 2022**
  - Working with electric utility providers to increase grid resilience during extreme weather events.
  - Developing a predictive model for robust vegetation management to reduce downed power lines.
  - All current and future projects focus on accelerating the renewable energy transition.

Learnable *Group Lead, Natural Language Processing* (Boston, MA)   **2019 – 2020**
  - For our industry-leading education product, I led a team of 5 engineers to develop a natural language processing algorithm for parsing messy student handwriting into structured machine language.
  - Product deployed in April 2020, and recently achieved over 99% accuracy in the 2021 Gaokao.

Auto-Intelligence *Intern, Deep Learning* (Shanghai, China)   **Summer 2018**
  - Worked with full-time engineers to deliver an automated defect-inspection solution for automotive manufacturing clients. Project used the state-of-the-art segmentation networks.

Service and Leadership

DEI (Diversity, Equity & Inclusion) Advisory Board (Westtown School)   **2018 – 2021**
  - Appointed by the Head of School to serve on an advisory board of trustees, faculty members and alumni. Formulated policies and initiatives on diversity, equity, and inclusion at my alma mater.

Admissions Tour Guide (Brown University, Westtown School)
  - Gave bilingual tours to prospective families at Westtown School, head of program.   **2017 – 2018**
  - Gave weekly large group tours for prospective families at Brown University.   **Summer 2019**

Meiklejohn/MAPS Peer Advisor (Brown University)
  - MAPS Mentor: Advised 2nd-year students in academic planning and major declaration.   **2020**
  - Meiklejohn Peer Advisor: Along with a faculty member, advised 1st-year students in navigating college academics and campus life.   **2019**

Awards and Honors

Resnick Sustainability Institute Graduate Scholar   **2023**
- Funded by the Resnick Sustainability Institute and driving sustainability research at Caltech.

Sigma Xi Scientific Research Honor Society   **2022**
- Invited to join the national honor society. Selected based on the research achievements.

Columbia University Presidential Fellowship (Columbia University)   **2022**
- The most prestigious fellowship awarded to admitted PhD students at Columbia University (declined).

CMMRS Pre-doctoral Research School (Saarbrücken, Germany)   **2021**
- A selective, week-long, all-expenses-paid summer research symposium at the Max Planck Institute.

Tau Beta Pi Engineering Honor Society (Brown University)   **2021**
- Invited to join the national honor society, which consists of the top-fifth of the graduating class.

Brown-Connect Israel Entrepreneurship Signature Program (Brown University)   **2020**
- Awarded $4000 stipend for an immersive summer internship in Israel.

Undergraduate Teaching and Research Award (Brown University)   **2019**
- Awarded $4,500 research stipend to pursue summer research at the Superfund Research Group.

Nelson Center for Entrepreneurship Synapse Barcelona Program (Brown University)   **2019**
- Invited to participate in an all-expenses-paid trip, connecting with entrepreneurs in Barcelona, Spain.

Hazeltine Engineering Grant (Brown University)   **2019**
- Awarded $1000 project stipend for developing an IoT bike helmet with integrated safety features.

Nelson Center Explore Grant (Brown University)   **2019**
- Awarded $250 project stipend for bottom-up market research for the IoT bike helmet.

BDW Maker Grant (Brown University)   **2019**
- Awarded $500 project stipend to cover initial material costs for the IoT bike helmet project.

National Spanish Exam Senior Scholarship (AATSP)   **2018**
- Silver medalist and recipient of the $1000 scholarship (second place).

Innovation Grant (Westtown School)   **2018**
- Awarded $500 in project stipend to build an IoT smart chicken coop for the 5th grade science curriculum at Westtown School. Project was featured in the *Independent Seminar Series*.

Alumni Association Highest Scholarship Award (Westtown School)   **2018**
- Awarded to the top two students in grades 11-12.

Charles K. Brown III Math Award (Westtown School)   **2018**
- Awarded to the top student in mathematics.

Peter Lane Math Award (Westtown School)   **2018**
- Awarded to the student who have shown both excellence and a collaborative spirit in mathematics.

The World Languages Award (Westtown School)   **2017, 2018**
- Awarded to the top students in world language of the year (Spanish).

Jonathan Rhoads Chemistry Award (Westtown School)   **2017**

- Awarded to the top two chemistry students of the year.

Kaesemeyer Leadership Award (Westtown School)   **2017**

- The most prestigious award at Westtown School, for students who have demonstrated exemplary leadership in service to the community.