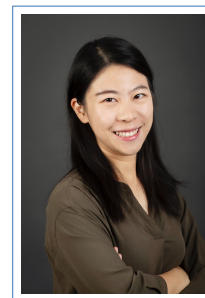


Yujia Huang

Curriculum Vitae

Department of EE
California Institute of Technology
☎ (+1) 6266286841
✉ yjhuang@caltech.edu
🌐 My Webpage
🐙 Github in LinkedIn



Education

- 2017–present **PhD, Electrical Engineering**, *California Institute of Technology*, Pasadena, USA.
Research interests: Robustness, Generative models, Representation learning, neuro-inspired machine learning.
- 2013–2017 : **B.E., Opto-electronics Science and Engineering**, *Zhejiang University*, Hangzhou, China.
Minor: Advanced Honors Class of Engineering (ACEE), Chu Kochen Honors College

Publications

- 2022 Weili Nie, Brandon Guo, **Yujia Huang**, Chaowei Xiao, Arash Vahdat, and Anima Anandkumar. Diffusion models for adversarial purification. In *ICML*, 2022.
- 2021 **Yujia Huang**, Huan Zhang, Yuanyuan Shi, J. Zico Kolter, and Anima Anandkumar. Training certifiably robust neural networks with efficient local lipschitz bounds. In *NeurIPS*, 2021.
- 2020 **Yujia Huang**, James Gornet, Sihui Dai, Zhiding Yu, Tan Nguyen, Doris Tsao, and Anima Anandkumar. Neural networks with recurrent generative feedback. In *NeurIPS*, 2020.
- 2020 **Yujia Huang**, Michelle Cua, Joshua Brake, Yan Liu, and Changhuei Yang. Investigating ultrasound–light interaction in scattering media. *Journal of Biomedical Optics*, volume 25, page 025002. International Society for Optics and Photonics, 2020.
- 2020 Haowen Ruan, Yan Liu, Jian Xu, **Yujia Huang**, and Changhuei Yang. Fluorescence imaging through dynamic scattering media with speckle-encoded ultrasound-modulated light correlation. *Nature Photonics*, pages 1–6. Nature Publishing Group, 2020.
- 2018 Youhua Chen, Wenjie Liu, Zhimin Zhang, Cheng Zheng, **Yujia Huang**, Ruizhi Cao, Dazhao Zhu, Liang Xu, Meng Zhang, Yu-Hui Zhang, et al. Multi-color live-cell super-resolution volume imaging with multi-angle interference microscopy. *Nature communications*, volume 9, pages 1–8. Nature Publishing Group, 2018.
- 2017 **Yujia Huang**, Dazhao Zhu, Luhong Jin, Cuifang Kuang, Yingke Xu, and Xu Liu. Laser scanning saturated structured illumination microscopy based on phase modulation. *Optics Communications*, volume 396, pages 261–266. Elsevier, 2017.
- 2017 Yue Fang, **Yujia Huang**, Shaocong Liu, Cuifang Kuang, and Xu Liu. Superresolution optical microscopy. *Microscopy Methods in Nanomaterials Characterization*, pages 241–291. Elsevier, 2017.

Presentations

- 2020 Learning efficiently with biologically inspired feedback. In *ECCV Virtual Tutorial on New Frontiers for Learning with Limited Labels or Data*, 2020.

Awards

- 2020 Rising Stars in EECS (UC Berkeley)
- 2019 Caltech C Scholarship
- 2017 Top 10 Academic Achievements of Zhejiang University
- 2016 Chu Kochen Scholarship (highest honor for Zhejiang University undergrads, 12/5400)

Research Experience

- August, 2019 – **Neural networks with recurrent generative feedback.**
 - Dec 2020 *Advisors : Doris Tsao, Anima Anandkumar*
Introduced generative feedback to neural networks and proposed the self- consistency formulation for robust perception.
Improved adversarial robustness and corruption robustness of feedforward neural networks with the proposed feedback mechanism.
- March, 2021 – **Certified defense against adversarial samples.**
 - present *Advisors: J. Zico Kolter, Anima Anandkumar*
Proposed an efficient and trainable local Lipschitz upper bound by considering the interactions between the piece-wise linear activation functions (e.g. ReLU) and weight matrices.
Our local Lipschitz bound consistently outperforms state-of-the-art methods in both clean and certified accuracy.
- August, 2017 – **Imaging through scattering media.**
 - August, 2019 *Advisor : Changhui Yang*
Investigated ultrasound-light interaction in scattering media.
Studied the ultrasound tagging efficiency in a manner consistent with its definition and experimentally verified the contributive (or noncontributive) relationship between the mechanisms involved in the ultrasound optical modulation process.

Industrial experience

NVIDIA Research, Machine Learning Research Group

Research intern, Mentor: Zhiding Yu, Senior Research Scientist, NVIDIA

- June, 2020 – **Large scale training for neural networks with recurrent feedback.**
 - Dec, 2020 Performed adversarial training for convolutional neural nets with recurrent feedback
Distributed the model on multi-node GPU cluster and improved the training speed by 4-5 times compared with training on a single node.
- Dec, 2020 – **Few-shot learning with prototypical feedback and memory replay.**
 - present Constructed a prototypical center for each class to guide the top-down feedback, and the prototypical centers are augmented by memory replay to incorporate historical information.
Demonstrated the effectiveness of the proposed framework on both few-shot and long-tailed learning benchmarks, where our method outperforms prior state-of-the-arts by considerable margins.

Teaching Assistantship

- Spring, 2020 : **CS165: Foundations in Machine Learning and Statistical Inference**, Caltech.
- Spring, 2019 : **CS165: Foundations in Machine Learning and Statistical Inference**, Caltech.
- Spring, 2018 : **EE151: Electromagnetic Engineering**, Caltech.