

# TANG, HAO

◇ (+1) 607-280-6764   ◇ haotang@cs.cornell.edu   ◇ <https://haotang1995.github.io>

## EDUCATION

---

**Cornell University**, Ithaca, New York

*Aug. 2021 - Present*

Ph.D. in Computer Science

Neuro-Symbolic Program Synthesis, Neural program, Symbol grounding

Advisor: Kevin Ellis

**Shanghai Jiao Tong University**, Shanghai, China

*Sep. 2013 - Mar. 2021*

M.S. in Computer Science and Engineering (with honors)

B.S. in Computer Science and Engineering (with honors)

Advisor: Bao-Liang Lu

## PUBLICATIONS

---

From perception to programs: regularize, overparameterize, and amortize (ROAP)

**Hao Tang**, Kevin Ellis

*ACM SIGPLAN International Symposium on Machine Programming (PLDI-MAPS)*, 2022.

Towards Scale-Invariant Graph-related Problem Solving by Iterative Homogeneous GNNs

**Hao Tang**, Zhiao Huang, Jiayuan Gu, Bao-Liang Lu, Hao Su

*Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2020

Refactoring Policy for Compositional Generalizability using Self-Supervised Object Proposals

Tongzhou Mu\*, Jiayuan Gu\*, Zhiwei Jia, **Hao Tang**, Hao Su

*Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2020

Belief Propagation Neural Networks

Jonathan Kuck, Shuvam Chakraborty, **Hao Tang**, Rachel Luo, J. Song, A. Sabharwal, Stefano Ermon

*Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2020

Emotion Recognition using Multimodal Residual LSTM Network

Jiaxin Ma\*, **Hao Tang\***, Wei-Long Zheng, Bao-Liang Lu

*ACM International Conference on Multimedia (ACM Multimedia)*, 2019

Multimodal emotion recognition using deep neural networks

**Hao Tang**, Wei Liu, Wei-Long Zheng, Bao-Liang Lu

*International Conference on Neural Information Processing (ICONIP)*, 2017

## INTERNSHIP

---

**Remote Research Intern**

*Mar. 2020 - Dec. 2020*

Ermon Group, Stanford University, CA, United States

- Generalized belief propagation to learnable faster graph neural network solvers while maintaining its theoretical guarantees (such as guaranteed correctness on tree-structured factor graphs).
- Keywords: Neural solvers, Amortized variational inference, Probabilistic graphical models
- Advisors: Stefano Ermon, Jonathan Kuck

**Visiting Graduate**

*Jul. 2019 - Mar. 2020*

Su Lab, University of California, San Diego, CA, United States

- Developed models that can be trained on graphs with no more than 50 nodes and generalize to graphs with diameters as large as 5000. We improved the generalizability of graph neural networks w.r.t. graph scales by introducing a learnable differentiable iterative module. Improved the generalizability of neural networks w.r.t. input value scales by proposing a principled, efficient homogeneous prior.

- Learned compositional generalizable policies by distilling existing high-reward policies into a student policy with stronger inductive bias. Involved joint symbol grounding and policy learning.
- Keywords: Neural program, Scale generalizability, Compositional generalizability, GNN
- Advisor: Hao Su

#### Research Intern

*Dec. 2018 - May. 2019*

OMRON SINIC X Corporation, Tokyo, Japan

- Proposed a differentiable operator that can principally integrate graphical sparse priors into neural networks. It relies on that the solution to an optimization problem that encodes the structured sparsity prior is partial differentiable w.r.t. the inputs, even though the solution is not closed-form.
- Keywords: Structured sparsity, Graph representation learning
- Mentions: James Kwok, Bao-Liang Lu, Jiaxin Ma

#### Research Assistant

*Jun. 2016 - Mar. 2021*

Shanghai Jiao Tong University, Shanghai, China

- Achieved state-of-the-art on public benchmarks for EEG-based multimodel emotion recognition.
- Keywords: Multimodel emotion recognition, LSTM, Electroencephalography (EEG)
- Advisor: Bao-Liang Lu

#### Research Intern

*Jul. 2015 - Sep. 2015*

Information Technology R&D Center of Mitsubishi Electric, Fujisawa, Japan

- Developed a Chinese intention understanding module for the dialog system in rice cookers.
- Mentors: Yu-Ming Zhao, Yi Jing

## HONORS AND AWARDS

---

- Outstanding Graduate of Shanghai Jiao Tong University (1%), 2017, 2021
- Scholarship of Academic Excellence (5%), 2013, 2014, 2015, 2017, 2018, 2019
- Crash Company Scholarship (3%), 2013, 2014, 2015

## COMPUTER SKILLS

---

**Framework:** PyTorch (contributor), Tensorflow (contributor), PyTorch-Geometric (contributor)

**Programming Languages:** Python, C++, Matlab