TANG, HAO

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

EDUCATION

Cornell University, Ithaca, NY, United States   *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. 2017 - Mar. 2021*
M.S. in Computer Science and Engineering (with honors)
Advisor: Bao-Liang Lu

Shanghai Jiao Tong University, Shanghai, China   *Sep. 2013 - Jun. 2017*
B.S. in Computer Science and Engineering (with honors)

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*
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*
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

TALKS

From perception to programs: regularize, overparameterize, and amortize (ROAP)
@ *PLDI Symposium on Machine Programming (PLDI-MAPS)*, Jun. 2022

Towards Scale-Invariant Graph-related Problem Solving by Iterative Homogeneous GNNs
@ *The 18th China Symposium on Machine Learning and Applications (MLA)*, Nov. 2020, Spotlight

Multimodal emotion recognition using deep neural networks
@ *International Conference on Neural Information Processing (ICONIP)*, Nov. 2017

OPEN SOURCE CONTRIBUTIONS

Pytorch: 4 commits

Tensorflow: 1 commit

Pytorch-Scatter (backend of Pytorch-Geometric): 2 commits

gfl (Graph-fused lasso solver): 4 commits

parallel-cut-pursuit (minimizes functionals structured over a weighted graph): 1 commit

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