Yuanbiao Wang

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Education

Tsinghua University Beijing, China

Bachelor's in Software Engineering *Aug. 2016 – July 2021*

- GPA: 3.82/4.0, Ranking: 7/85
- Core courses: 4.0 GPA for Calculus, Linear Algebra, Probability and Statistics, Data Structure, Introduction To Algorithms, Deep Learning, Introduction to Artificial Intelligence, Modern Operating Systems, etc.

Projects and Experiences

Learning a white-box test-time augmentation policy for biomedical models June 2020 – Present

Advised by Prof. Hanspeter Pfister *Harvard University*

- Modeling a discrete policy-decision process for the test-time data augmentation task (by describing the white-box image filters as discrete options and learning an optimized stochastic policy to choose among the filters for each input image instance); Propose a novel method based on the Proximal Policy Optimization (PPO) algorithm to train a CNN-parameterized agent for such task.
- Exploit and experiment with multiple possible enhancement trick to improve the performance of the PPO agent, such as cooling(initialize the agent output to be a uniform distribution); Entropy regularization(penalize the uncertainty of generated policy); Focal reward(utilized to implicity facilitate the update of the parameters with lower confidence); Positive-resampling (Explicitly assign greater weights to the policy with positive reward; Multi-agents for multi-label classification problem; etc. .
- Conducted experiments on manually-corrupted MNIST dataset with an 7.81% increase in the accuracy, proving our method can considerably enhance the robustness of the model; Conducted experiments on the famous ChestXray14 and Chexpert dataset and report up to 3.37% accuracy increase for some of the classes (e.g. Infiltration); Compared our method to the oracle (expert policy or groundtruth) and imitation learning (learning with the oracle labels)
- Preparing a first-author paper that will be submitted to ICML2021.

Facial expression recognition through multi-task semi-supervised learning April. 2020 – Present

Advised by Prof. Yue Gao *Tsinghua University*

- Reproduce the state-of-art contrastive learning methods on facial expression recognition and report an 46.03% test accuracy on the Affectnet facial expression recognition (FER) benchmark dataset
- Proposed a multi-task learning framework to enhance the performance with auxiliary facial landmark detection task; Report a 46.79% test accuracy on Affectnet dataset, with an 0.76% increase compared to the baseline SimCLR method.
- Experimenting with human-facial-specific weakly-supervised facial deformation (3d warping by the mapping of Delauney triangles of facial landmarks) as the data augmentation to increase its relevance with our specific task; Also trying with a GAN-like network to generate an optimized warping field

Using Hypergraph neural networks for affective computing Feb 2019- May 2019

Advised by Prof. Yue Gao *Tsinghua University*

- Researched and improved the method of Hypergraph Neural Networks(HGNN) by adding a modality-wise attention block.
- Proposed a new hypergraph construction method and a handcrafted input feature the takes into account the individual specification to enhance the performance of the model
- Implemented the improved HGNN method using PyTorch and ran several experiments on the DEAP and ASCERTAIN dataset (two benchmarks for affective computing); reported a 2.68% and 5.09% accuracy increase respectively

Social Activities

Student Union | *School of Software, Tsinghua University* | *Publicity Department Officer* Aug 2017 – Sept 2018

- Responsible for suggesting publicity activities as well as drafting and finalizing publicity materials
- Accounted for a large proportion of publicity work
- Tutored newly recruited members to help them develop publicity skills

Awards

- Comprehensive Excellence Award of Tsinghua University in 2018, 2019 and 2020(Awarded only to the top 10% undergraduate students)

Technical Skills

Programming Languages: Python, Java, C/C++, SQL, JavaScript, HTML/CSS
Professional Softwares: PyTorch, sklearn, numpy, Vue, Flask, Git, LaTeX
Language: English(fluent), Chinese(native)