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 in Calculus, Linear Algebra, Probability and Statistics, Data Structure, Introduction to Algorithms, Deep Learning, Introduction to Artificial Intelligence, Modern Operating Systems.

Projects and Experiences

Learning a white-box test-time augmentation policy for biomedical models June 2020 – Present
Advised by Prof. Hanspeter Pfister *Harvard University*

- Modeled white-box test-time data augmentation as a continuous optimization problem over enhancement levels, rather than the traditional decision-making process modeling.
- Designed a novel optimization method based on gradient estimation; used a surrogate student model to generate biased gradients, subsequently yielding an estimation of the covariance matrix, hence accelerating optimization.
- Experimented with the proposed method on the manually-corrupted MNIST dataset; reported up to 4.6% decrase in cross entropy loss. and up to 2% increase in accuracy using only 10% of test data to train our policy network. Experimented with the ChestXRay14 dataset and achieved a 2.23% decrease in BCE loss with 1% of test labels.
- Preparing a first-author submission to ICML2021. The preprints will be uploaded to my personal page.

Facial expression recognition through multi-task semi-supervised learning April. 2020 – Present
Advised by Prof. Yue Gao *Tsinghua University*

- Reproduced the state-of-art contrastive learning methods on facial expression recognition; reported an 46.03% test accuracy on Affectnet facial expression recognition (FER) benchmark dataset
- Proposed a multi-task learning framework to enhance the performance with auxiliary facial landmark detection tasks; reported a 46.79% test accuracy on the AffectNet dataset, with a 0.76% increase compared to the baseline SimCLR method.
- Experimenting with facial deformation augmentation specific to human faces(3D warping by the mapping of Delaunay triangles of facial landmarks) to increase its relevance to our specific task.

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 that takes into account the individual specification to enhance the performance of the model.
- Implemented the improved HGNN method in PyTorch and ran several experiments on the DEAP and ASCERTAIN dataset (two benchmarks for affective computing); reported a 2.68% and 5.09% increases in accuracy, respectively. See the preprint here.

Social Activities

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

- Responsible for providing publicity activities and drafting and finalizing publicity materials.
- 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% of undergraduate students)

Technical Skills

Programming Languages: Python, Java, C/C++, SQL, JavaScript, HTML/CSS
Professional Software: PyTorch, sci-kitlearn, NumPy, Vue, Flask, Git, LaTeX
Language: English(fluent), Chinese(native)