YUJIAN YUAN

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EDUCATION

Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China 2022 - Present
M.Eng. in Applied Computer Technology **Supervisor: Prof. Shiguang Shan**

University of Chinese Academy of Sciences (UCAS), Beijing, China 2018 - 2022
B.S. in Computer Science and Technology **Cumulative GPA: 3.81/4.00 Rank: 22/104**

CURRICULUM

Calculus: 100; Linear Algebra: 95; Probability theory and Mathematical statistics; Discrete Mathematics; Data Structure; Fundamentals of Artificial Intelligence; Image Processing; Computer Vision; Natural Language Processing; Pattern Recognition and Machine Learning; Video Processing and Analysis; Algorithm Design and Analysis

PUBLICATIONS

- J. Zeng, **Y. Yuan**, et al., "Multi-view Facial Expressions Analysis of Autistic Children in Social Interaction," IEEE Transactions on Affective Computing (TAC) *in submission*, 2024. (CCF-B) (First student author)
- **Y. Yuan**, J. Zeng and S. Shan, "Describe Your Facial Expressions by Linking Image Encoders and Large Language Models," British Machine Vision Conference (BMVC) **Oral**, 2023. (CCF-C)

RESEARCH PROJECTS

Facial Expression Coding (In Cooperation With Huawei) Aug. 2023 - Present
Primary Developer *Supervisor: Prof. Shiguang Shan, Prof. Jiabei Zeng*

- To develop a facial expression coding method to assess the similarity between the facial expressions of two people.
- Proposed a three-stage framework to first learn facial features from large-scale face datasets, and then disentangle facial expression feature from facial features by orderly removing head pose feature and identity feature.
- Proposed a benchmark for evaluating facial expression coding quality, created from video facial expression datasets and multi-view facial expression datasets to assess model performance in scenarios with and without pose variation.

Facial Expression Analysis for Autism Spectrum Disorder (ASD) Sep. 2023 - Mar. 2024
Leader *Supervisor: Prof. Shiguang Shan, Prof. Jiabei Zeng*

- Proposed a multi-view facial expression recognition strategy based on head pose estimation and achieved 87.4% facial expression recognition accuracy during social interactions with significant head movement.
- Developed a framework to detect and quantify the diversity and dynamic complexity of ASD children's facial expressions during social interaction.
- Proposed using the extracted facial expression features in SVM to differentiate ASD from typically developing children, achieving 96.9% classification accuracy in our designed 'Peekaboo' activity.

Facial Expression Captioning Based On Vision-Language Model Mar. 2023 - May 2023
Leader *Supervisor: Prof. Shiguang Shan and Prof. Jiabei Zeng*

- Proposed facial expression captioning, a new task to describe nuances of facial expressions and infer the corresponding emotions in words.
- Proposed to use LLM ChatGPT to synthesize training image-text pairs of action unit and emotion datasets for vision-language model, applying zero-shot prompting and one-shot prompting.
- Demonstrated SOTA performance of the trained facial expression captioner and intermediate visual representation.
- It is **the first** captioner that can describe emotions/facial actions not seen in training, showing zero-shot capability.

Numerical Estimation of Big Five Personality Nov. 2021 - Sep. 2022
Leader *Supervisor: Prof. Shiguang Shan and Prof. Jiabei Zeng*

- Proposed analyzing facial movements during specific movie viewing to assess testers' Big Five Personality scores.
- Proposed a method to encode video facial movement by applying 1d convolution to frame-level facial expression features, including basic facial expressions, facial action units, valence and arousal.
- The accuracy rate for correctly classifying intervals of Big Five personality scores exceeds 80%.

Psycho-Face: AI-Aided Psychological Estimation System Sep. 2021 - Sep. 2022
Primary Developer, in collaboration with Prof. Jiabei Zeng *Supervisor: Prof. Shiguang Shan*

- Proposed a multi-task learning method based on pseudo-labeling and label selection.
- Built a system demo that estimates the basic emotion, facial action units, valence and arousal of emotion, heart rate, blink rate of the tester in real time.
- This system generates a report with statistical indicators after testers have watched designed movies, and offers a psychological assessment based on these results.

Face Recognition Mar. 2021 - Jul. 2021
Leader *Supervisor: Prof. Shiguang Shan*

- Proposed a face recognition model based on ResNet-18 and trained with ArcFace loss.
- Used facial landmarks detection and affine transformation for face alignment to enhance model performance.
- Achieved 92% face recognition accuracy on DIP-competition dataset in face recognition competition of UCAS.

Leaderless Group Decision Making Feb. 2019 - May 2021
Developer *Supervisor: Prof. Shan Yu*

- Proposed a method to modulate the strength of interactions among members by adjusting the number of seen neighbors to enhance the efficiency and accuracy of leaderless group decision-making.
- Developed a WeChat mini program for data collection. In each session, the participant selects one of three options, taking into account the choices made by seen neighbors.
- Revealed that group decision-making improves when each of 1,000 people consider the opinions of 10-20 neighbors.

HONORS AND AWARDS

Academy Scholarship of University of Chinese Academy of Science (Top 5% and Top15%)	2019 and 2020
National Encouragement Scholarship	2019 and 2020
Merit Student of University of Chinese Academy of Sciences	2019, 2022 and 2023
Postgraduate Scholarship	Oct. 2023

SKILLS

- Programming Languages: Python, C, C++, Go, Verilog, Assembly Language
- Framework: PyTorch > TensorFlow
- Development: Qt, Git, Numpy, Matplotlib, Conda, Pandas, Scikit-learn
- Language Proficiency: English (TOFEL(ITP): 583)