Shi Tang

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- Focus on learning systems allowing the rapid establishment of models with lower requirements on data and ML expertise.
- Familiar with metric-based few-shot learning, have worked on improving novel-class generalization of these methods.
- Currently interested in developing novel meta-learning methods better capable of handling the complexity of task space.

EDUCATION

Tsinghua University *Beijing, China*
Master of Software Engineering *Sep. 2021 - Jun. 2024*

- **GPA:** 3.73/4.0
- **Research:** few-shot learning and meta-learning, advised by Prof. Guiming Luo
- **Core courses:** Deep Learning (A), Automaton and Formal Logic (A), Data Stream System Modeling and Simulation (A-)

Dalian University of Technology *Dalian, China*
Bachelor of Software Engineering *Sep. 2017 - Jun. 2021*

- **GPA:** 3.81/5.0
- **Rank:** 3rd/84
- **Research:** depth estimation, advised by Prof. Xinchen Ye
- **Core courses:** Machine Learning (98), Signal Processing (95), Computer Vision (91), Data Structure and Algorithm (94)

PUBLICATIONS & PREPRINTS

Unleash the Power of Local Representations for Few-Shot Classification ↗
Shi Tang, Guiming Luo, Xinchen Ye, Zhiyi Xia
Under review

- Focus on the unexploited potential of local representations in improving novel-class generalization.
- Propose a novel pretraining paradigm for few-shot learning and an adaptive metric to handle various set combinations.
- Propose a UniCon KL-Divergence for distilling few-shot learning nets with both theoretical and empirical supports.
- **New state of the art** on five popular benchmarks, **outperforms transductive and cross-modal methods** in the fine-grained scenario.

Cross-Modality Depth Estimation via Unsupervised Stereo RGB-to-Infrared Translation ↗
Shi Tang, Xinchen Ye, Fei Xue, Rui Xu
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

- Propose to estimate depth in a cross-modal way to improve robustness to illumination and misleading textures.
- Propose a Fourier domain adaptation strategy and a multi-space warping regularization for synthesizing stereo IR images.
- Error reduction of **6.13%** and **5.10%** on D1-all against GWCNet and Monodepth, respectively.

PROJECTS

Parameter Residual Diffusion for Domain Adaptation *Jun. 2024 - present*

- Generate model parameters for the target domain directly with **better performance and diversity**.
- Propose to generate the residual between source and target models for ease of generation.
- Incorporate low-rank decompostion of parameter matrices to increase the number of parameters that can be generated.

Meta-Learning for Cross-Subject Hand Gesture Recognition via Electromyography *Aug. 2022 - Sep. 2023*

- Focus on cross-subject recognition that is seldom considered by previous research.
- Regard recognition for different subjects as tasks within one family, and propose to learn across them.
- Propose to divide EMG signals converted to Fourier domain into groups by frequency band and meta-learn the weights of different bands for different subjects.
- Accuracy improvement of **13.04%** against baseline in cross-subject setting.

Task-Specific Few-Shot Classification by Balancing Sample- and Class-Level Generalization *Jun. 2022 - Jun. 2023*

- Aiming at few-shot classification tasks in real-world scenarios where new tasks may contain both base and novel classes.
- Propose to fuse features of normal and episodic pretraining weighted by a proposed Cross-Attention Module to balance sample- and class-level generalization task-specifically.
- Improvements of **16.30%**, **6.91%** and **1.46%** against normal pretraining, episodic pretraining and Meta-Baseline, respectively for accuracy on reconstructed miniImageNet under 1-shot setting.

Scene Depth Perception based on Binocular Infrared Camera *Sep. 2019 - Sep. 2020*

- Extend the binocular depth estimation task from visible band to infrared band.
- Propose a novel domain adaption strategy and a feedback learning strategy to reduce the domain gap between different datasets.

Vehicle Mounted Multi-Band Stereo Vision Perception System *Aug. 2018 - Sep. 2019*

- Responsible for improving the sub-pixel corner detection algorithm based on the checkerboard pattern, as well as the calibration and rectification of infrared cameras.
- Propose a novel infrared calibration board design scheme.
- **Won the bid** in July 2019.

INTERNSHIP EXPERIENCE

DP Technology *Beijing, China*
Research Intern, develop few-shot learning algorithms for segmenting electron microscope images. *Aug. 2024 - present*
HKUST *Guangzhou, China*
Research Intern, developed a meta-learning method for cross-subject hand gesture recognition. *Aug. 2022 - Sep. 2023*

TEACHING EXPERIENCE

Automaton and Formal Logic *Beijing, China*
Tsinghua University *Fall 2022*
Teaching Assistant, lecturing mid-term test, as well as designing the final test.

Formal Language and Automaton *Beijing, China*
Tsinghua University *Spring 2022 & 2023*
Teaching Assistant, lecturing mid-term test, as well as designing the final test.

AWARDS

2023	**Tsinghua Academic Scholarship**	2019	**Third Prize in CUMCM**
2022	**Guoshuang Scholarship**	2019	**Academic Excellence Scholarship (top 5%)**
2021	**Outstanding Graduate (top 5%)**	2018	**Academic Excellence Scholarship (top 5%)**
2020	**Academic Excellence Scholarship (top 5%)**	2018	**Lingshui Scholarship (top 3%)**