

# 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

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### Tsinghua University

Master of Software Engineering

*Beijing, China*

*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

Bachelor of Software Engineering

*Dalian, China*

*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

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### Unleash the Power of Local Representations for Few-Shot Classification [↗](#)

Shi Tang, Guiming Luo, Xinchen Ye, Zhiyi Xia

Under review at AAAI'25

- 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

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### 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 decomposition 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.

## AWARDS

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

## TEACHING EXPERIENCE

### Automaton and Formal Logic

Tsinghua University

Teaching assistant, lecturing mid-term test, as well as designing the final test.

Beijing, China

Fall 2022

### Formal Language and Automaton

Tsinghua University

Teaching assistant, lecturing mid-term test, as well as designing the final test.

Beijing, China

Spring 2022 & 2023

## ACADEMIC SERVICE

### Peer Reviewer

- Frontiers in Computer Science
- International Conference on Acoustics, Speech and Signal Processing (ICASSP)