

# Jialei Chen

## Research Internship Application

jialeichen2021@gmail.com

+81-080-9730-5150

psmobile.github.io



### EDUCATION

<b>Ph.D student, Intelligent Systems (Ph.D advisor: Daisuke Deguchi, Hiroshi Murase)</b> School of Informatics, Nagoya University	2022.10 — now
<b>Master, Information and Communication Engineering (master advisor: Chong Fu)</b> School of Computer Science and Engineering, Northeastern University (China)	2019.9 — 2022.7
<b>Bachelor of Engineering, Communication Engineering (GPA: 3.5/5)</b> School of Computer and Communication Engineering, Northeastern University (China)	2015.9 — 2019.7

### RESEARCH INTERESTS

- Semantic segmentation, Zero-shot learning, Multi-modality Learning, Open-vocabulary Learning, Computer vision

### RESEARCH ACHIEVEMENTS (SELECTED)

My research focuses on developing high-performance and efficient deep learning models for zero-shot segmentation, which aims to pixel-wisely understand an image and generalize to unlimited classes. The key outcomes of this work are listed as follows:

#### Journal Publications

- Jialei Chen**, Daisuke Deguchi, Chenkai Zhang, Xu Zheng, Hiroshi Murase; **Frozen is Better than Learning: A New Design of Prototype-Based Classifier for Semantic Segmentation**; *Pattern Recognition* (IF 7.5 / JCR Q1)  
<https://www.sciencedirect.com/science/article/pii/S0031320324001821>
- Jialei Chen**, Chong Fu, Haoyu Xie, Xu Zheng, Chiu-Wing Sham; **Uncertainty Teacher with Dense Focal Loss for Semi-Supervised Medical Image Segmentation**; *Computers in Biology and Medicine* (IF 7.0 / JCR Q1)  
<https://www.sciencedirect.com/science/article/pii/S001048252200751X>
- Zhenzhen Quan, **Jialei Chen**, Daisuke Deguchi, Jie Sun, Chenkai Zhang, Yujun Li, Hiroshi Murase; **Semantic Matters: A Constrained Approach for Zero-Shot Video Action Recognition**; *Pattern Recognition* (IF 7.5 / JCR Q1)  
<https://www.sciencedirect.com/science/article/pii/S0031320325000627>
- Chenkai Zhang, Daisuke Deguchi, **Jialei Chen**, Hiroshi Murase; **Toward Explainable End-to-End Driving Models via Simplified Objectification Constraints**; *IEEE Transactions on Intelligent Transportation Systems* (IF 7.9 / JCR Q1)  
<https://ieeexplore.ieee.org/abstract/document/10505932>

#### Domestic Conference

- Jialei Chen**, Daisuke Deguchi, Chenkai Zhang, Xu Zheng, and Hiroshi Murase; **A Study on Fixed Orthogonal Prototype Classifier for Semantic Segmentation**; CVIM 2024
- Jialei Chen**, Daisuke Deguchi, Chenkai Zhang, and Hiroshi Murase; Distill from CLIP by Token Alignment for Inductive Zero-shot Semantic Segmentation, "Proceedings of 27th Meeting on Image Recognition and Understanding (MIRU2024)"
- A Preliminary Study on Pre-training for Improved Explainability in End-to-End Driving Models, Chenkai Zhang, Daisuke Deguchi, Jialei Chen, Hiroshi Murase, CVIM 2024

#### International Conference

- Jialei Chen**, Daisuke Deguchi, Chenkai Zhang, Xu Zheng, and Hiroshi Murase; **Centroid Module for Shaping Feature Space in Semantic Segmentation**; Proceedings of the 2024 3rd Asia Conference on Algorithms, Computing and Machine Learning
- Jialei Chen**, Daisuke Deguchi, Chenkai Zhang, Zhenzhen Quan, Seigo Ito, Hiroshi Murase; **Multi-group Vision Semantic Centroid for Semantic Segmentation**, International Workshop on Frontiers of Computer Vision 2025

- Chenkai ZHANG, Daisuke DEGUCHI, **Jiale Chen**, Zhenzhen QUAN, Hiroshi MURASE, **CROCODILE: Crop-based Contrastive Discriminative Learning for Enhancing Explainability of End-to-End Driving Models**, Proceedings of the Asian Conference on Computer Vision 2024
- Hiroto Murakami, **Jiale Chen**, Daisuke Deguchi, Takatsugu Hirayama, Yasutomo Kawanishi, Hiroshi Murase: "Pedestrian's Gaze Object Detection in Traffic Scene, Proceedings of the 19th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP) 2024
- Chenkai Zhang, Daisuke Deguchi, **Jiale Chen**, Hiroshi Murase: "Comprehensive Evaluation of End-to-End Driving Model Explanations for Autonomous Vehicles," Proceedings of the 19th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP) 2024

## Under Review / Preprints

- **Jiale Chen**, Daisuke Deguchi, Chenkai Zhang, Xu Zheng, and Hiroshi Murase; **Clip is Also a Good Teacher: A New Learning Framework for Inductive Zero-Shot Semantic Segmentation**; *arXiv preprint*, submitted to *IEEE Transactions on Circuits and Systems for Video Technology*  
<https://arxiv.org/pdf/2310.02296>
- **Jiale Chen**, Daisuke Deguchi, Chenkai Zhang, and Hiroshi Murase; **Generalizable Semantic Vision Query Generation for Zero-Shot Panoptic and Semantic Segmentation**; *arXiv preprint*, submitted to *International Journal on Computer Vision*  
<https://arxiv.org/pdf/2402.13697>
- **Training-Free Open-Vocabulary Semantic Segmentation with Affinity Pyramid Refinement** (First Author)  
Submitted to *ICCV 2025*
- **BiXFormer: A Robust Framework for Maximizing Modality Effectiveness in Multi-Modal Semantic Segmentation** (First Author)  
Submitted to *ICCV 2025*

## ACADEMIC SERVICES

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Reviewers for CVPR, IJCNN, IEEE Signal Processing Letters

## AWARDS

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- First class academic scholarship, Northeastern University, 2019
- Second class academic scholarship, Northeastern University, 2020
- "Towards Zero-Shot Semantic Segmentation based on Vision-Language Model," Excellent Presentation Award (Selected by Faculty) at Midterm Presentation, Nagoya University, 2024

## LANGUAGE

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Japanese: conversational, English: Fluent, Chinese: Native