

Wenfang Sun | Résumé

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Education

University of Science and Technology of China

Master, Computer Science

Hefei

2021-2024

Anhui University

Bachelor, Communication Engineering

Hefei

2017-2021

Research Interests

My previous research was primarily focused on few-shot learning. Currently, I am enthusiastic about foundation models. Additionally, my research involves the exploration of prompt learning and test-time adaptation.

Research Experience

Few-shot Learning with Fewer Tasks

Supervision of Dr. Xiantong Zhen and Prof. Cees G. M. Snoek.

- ★ Proposed MetaModulation, an innovative approach for few-shot learning, tackles the constraint of limited meta-training tasks by employing neural networks to modulate batch normalization parameters during training.
- ★ Proposed a variational extension of MetaModulation, introducing uncertainty-aware meta-learning through treating modulation parameters as latent variables.
- ★ Introduced learning variational feature hierarchies within the framework of variational MetaModulation, enabling modulation of features at all network layers.

Training-Free Semantic Segmentation via LLM-Supervision

Supervision of Yingjun Du and Prof. Cees G. M. Snoek.

- ★ Proposed a novel text-supervised semantic segmentation framework leveraging large language model supervision for enhanced class descriptors and improved segmentation accuracy.
- ★ Proposed an advanced subclass generation technique using a large language model, such as GPT-3, to refine class representations in text-supervised semantic segmentation.
- ★ Proposed an effective ensembling strategy that merges diverse segmentation maps from generated subclass descriptors, ensuring a comprehensive representation of unique characteristics in test images.

IPO: Interpretable Prompt Optimization for Vision-Language Models

Supervision of Yingjun Du and Prof. Cees G. M. Snoek.

- ★ Proposed a simple yet interpretable prompt optimizer that utilizes Large Language Models (LLMs) to generate textual prompts dynamically.
- ★ Introduced a novel prompt mechanism that guides LLMs in creating effective prompts while storing past prompts with their performance metrics, providing rich in-context information.
- ★ Incorporated a large multimodal model (LMM) to generate image descriptions, enhancing the interaction between textual and visual modalities.

Publications

★ [1] **Wenfang Sun***, Yingjun Du*, Xiantong Zhen, Fan Wang, Ling Wang and Cees GM Snoek. MetaModulation: Learning Variational Feature Hierarchies for Few-Shot Learning with Fewer Tasks(**ICML**), 2023. (Equal contribution)

★ [2] **Wenfang Sun***, Yingjun Du*, Gaowen Liu, Ramana Rao Kompella, and Cees GM Snoek. Training-Free Semantic Segmentation via LLM-Supervision (**In 2nd Workshop on What is Next in Multimodal Foundation Models? at CVPR 2024**),2024 (Equal contribution)

★ [3] Yingjun Du*, **Wenfang Sun***, and Cees GM Snoek. IPO: Interpretable Prompt Optimization for Vision-Language Models(**submitted to NeurIPS 2024**), 2024. (Equal contribution)

Awards

2024: Outstanding Graduate Award of Ordinary Colleges and Universities in Anhui Province USTC

2024: Outstanding Graduate Award of University of Science and Technology of China USTC

2023: National Scholarship USTC

Skills

Proficient: Python, ML/CV libraries (PyTorch, Tensorflow, OpenCV)

Partial experience: C/C++, Ros

Reviewer

ACMMM 2024, CVPR2024 Workshop.

Academic References

★ **Dr. Xiantong Zhen**

Dr. Xiantong Zhen is currently the Director of AI Research at Central Research Institute, United Imaging Healthere, Co., Ltd. Previously, he was an Assistant Professor and Scientific Manager at the AI for Medical Imaging Lab at the University of Amsterdam, The Netherlands.

★ **Dr. Gaowen Liu**

Dr. Gaowen Liu is a distinguished researcher at Cisco Research. With a Ph.D. in Computer Science from the University of Trento, she has significantly expanded her research horizons as a visiting scholar at Carnegie Mellon University and the University of Michigan. Her impactful contributions span computer vision, machine learning, and multimedia, resulting in the publication of over 20 research papers.

★ **Prof. Cees G. M. Snoek**

Prof. Cees G. M. Snoek is currently a Professor at the University of Amsterdam, specializing in computer vision through machine learning. With a decade of experience, he has authored over 250 papers, mentored 30 PhD students and postdocs, and serves as an associate editor for the IEEE Transactions on Pattern Analysis and Machine Intelligence. Additionally, he holds senior memberships in both the IEEE and the ACM and is recognized as an Ellis Fellow.