

Xiaohan Zou

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Education

Pennsylvania State University	State College, PA
Ph.D. in Computer Science and Engineering	08/2023 - Present
Boston University	Boston, MA
M.S. in Computer Science	09/2021 - 01/2023
Tongji University	Shanghai, China
B.Eng. in Software Engineering	09/2016 - 07/2020

Publications and Preprints (also see [Google Scholar](#))

- P1 **Reconstruct before Query: Continual Missing Modality Learning with Decomposed Prompt Collaboration** [Paper]
Shu Zhao, [Xiaohan Zou](#), Tan Yu, Huijuan Xu
Under review
- P2 **TokenFlow: Rethinking Fine-grained Cross-modal Alignment in Vision-Language Retrieval** [Paper]
[Xiaohan Zou](#), Changqiao Wu, Lele Cheng, Zhongyuan Wang
Preprint, 2022
- P3 **Efficient Meta-Learning for Continual Learning with Taylor Expansion Approximation** [Paper]
[Xiaohan Zou](#), Tong Lin
International Joint Conference on Neural Networks (IJCNN), 2022, Oral
- P4 **To be an Artist: Automatic Generation on Food Image Aesthetic Captioning** [Paper]
[Xiaohan Zou](#), Cheng Lin, Yinjia Zhang, Qinpei Zhao
International Conference on Tools with Artificial Intelligence (ICTAI), 2020, Oral
- P5 **A Survey on Application of Knowledge Graph** [Paper]
[Xiaohan Zou](#)
International Conference on Control Engineering and Artificial Intelligence (CCEAI), 2020

Industry Experience

Kuaishou Technology · Intelligent Creation Team	Beijing, China
<i>Machine Learning Engineer Intern</i>	2021 - 2022
Worked on fine-grained vision-language learning (see P2). Built a PyTorch codebase for video-text retrieval.	
China Electronics Technology Group Corporation	Chongqing, China
<i>Software Engineer Intern</i>	2020 - 2021
Participated in developing a security visualization system for an archaeological site, utilizing Vue and Cesium.	
Banana Interactive	Shanghai, China
<i>Game Engineer Intern</i>	2019 - 2020
Developed and maintained three HTML5 games using JavaScript and Affinity Designer.	

Academia Experience

Pennsylvania State University	State College, PA
<i>Research Assistant (Advisor: Prof. Huijuan Xu)</i>	2023 - Present
Worked on video class-incremental learning and continual missing modality learning (see P1).	

Boston University	Boston, MA
<i>Graduate Student Researcher (Advisor: Prof. Bryan Plummer)</i>	2022 - 2023
Worked on rehearsal-free continual learning with an arbitrary, fixed parameter budget.	
Peking University	Remote
<i>Research Intern (Advisor: Prof. Tong Lin)</i>	2020 - 2022
Designed a fast meta-learning algorithm for continual learning problems (see P3).	
Tongji University	Shanghai, China
<i>Undergraduate Student Researcher (Advisor: Prof. Qinpei Zhao)</i>	2020
Proposed a method for food image aesthetic captioning and created a dataset for this novel task (see P4).	
Tongji University · Xlab	Shanghai, China
<i>Undergraduate Student Researcher (Advisor: Prof. Qingfeng Du)</i>	2018 - 2019
Worked on 1) speech emotion recognition and 2) fault diagnosis for microservice architectures without knowledge of the calling graph using Bayesian networks.	
Peking University	Beijing, China
<i>Research Intern (Advisor: Prof. Tong Lin)</i>	2018
Worked on semi-supervised machine translation utilizing the structure duality.	

Research Projects

Scalable Parameter-Efficient Continual Learning	2022 - 2023
Boston University (Advisor: Prof. Bryan Plummer)	Boston, MA
<ul style="list-style-type: none"> ◦ Achieved zero forgetting with an arbitrary, fixed parameter budget and without episodic memory ◦ Proposed learning task-specific networks through shared weight templates, where each network layer is defined as a linear combination of these templates ◦ Surpassed the majority of recent methods while using less than one-fifth of the parameters 	
Fine-grained Vision-Language Learning (See P2)	2021 - 2022
Kuaishou Technology (Mentor: Changqiao Wu)	Beijing, China
<ul style="list-style-type: none"> ◦ Devised a novel model-agnostic framework for fine-grained cross-modal semantic alignment, subsuming recent popular works into the proposed scheme ◦ Proposed a fine-grained video-text retrieval method that achieves better or on-par performance against the SoTA approaches with heavy model designs, by merely altering the similarity function 	
Efficient Meta-Learning for Continual Learning (Published in IJCNN 2022, see P3)	2021 - 2022
Peking University (Advisor: Prof. Tong Lin)	Remote
<ul style="list-style-type: none"> ◦ Designed an efficient method for estimating parameter importance using Taylor expansion ◦ Proposed a fast meta-learning algorithm for continual learning that calculates the gradient of meta-updates in closed-form, bypassing the need for Hessian information ◦ Outperformed strong baselines while optimizing much more efficient on popular benchmarks 	

Software

Flint: A toy deep learning framework built from scratch using Numpy (see code)
<ul style="list-style-type: none"> ◦ Implemented an autograd engine, layers (Linear, Convolution, MaxPooling, Unfold, Dropout, Flatten), 6 optimizers, 4 loss functions, 3 activation functions, 5 initializers, and a data loader in pure Numpy ◦ Wrote complete documentation and comprehensive unit tests

Awards and Honors

Bronze , China Collegiate Programming Contest (CCPC)	2018
Finalist , ACM International Collegiate Programming Contest (ICPC) Asia Regional	2018
Second Prize , China Mathematical Contest in Modeling (CUMCM)	2017, 2018
Second Prize , Tongji University Programming Contest	2017, 2018
Second Prize , East China Normal University Programming Contest	2017

Services and Activities

Reviewer for NeurIPS 2023	
Vice Chief Technology Officer & Chief Experience Officer at Tongji Microsoft Student Club	2018 - 2019









Core Courses

Machine Learning: Vision and Language, Natural Language Processing, Machine Learning, Image and Video Computing, Computational Tools for Data Science

Mathematics: Probability and Mathematical Statistics, Calculus, Linear Algebra, Discrete Mathematics

Skills

Programming Languages:  Python,  JavaScript /  TypeScript,  HTML /  CSS,  Java

Tools and Frameworks:  PyTorch,  Vue,  React,  Flask,  Django,  Linux,  Git,  L^AT_EX

Languages: Chinese (native), English (proficient)