

Xiaohan Zou

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Education

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|--------------------------------|-------------------|
| 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 Submitted Manuscripts

- **Xiaohan Zou**, Changqiao Wu, Lele Cheng, and Zhongyuan Wang. "TokenFlow: Rethinking Fine-grained Cross-modal Alignment in Vision-Language Retrieval", **submitted to** ACM International Conference on Multimedia (**ACM MM**), 2022.
- **Xiaohan Zou**, and Tong Lin. "Efficient Meta-Learning for Continual Learning with Taylor Expansion Approximation", International Joint Conference on Neural Networks (**IJCNN**), 2022. (**Oral Presentation**)
- **Xiaohan Zou**, Cheng Lin, Yinjia Zhang, and Qinpei Zhao. "To be an Artist: Automatic Generation on Food Image Aesthetic Captioning", International Conference on Tools with Artificial Intelligence (**ICTAI**), 2020. (**Oral Presentation**) [[Paper](#)] [[Code](#)] [[Slide](#)]
- **Xiaohan Zou**. "A Survey on Application of Knowledge Graph", International Conference on Control Engineering and Artificial Intelligence (**CCEAI**), 2020. [[Paper](#)]

Professional Experience

Machine Learning Engineer Intern, Kuaishou Technology, Beijing 07/2021 - 04/2022

- Devised a new model-agnostic formulation for fine-grained cross-modal semantic alignment and subsumed the recent popular works into the proposed scheme
- Proposed a video-text retrieval method which is competitive when compared with the SoTA approaches with heavy model design by only altering the similarity function, **submitted to ACM Multimedia 2022**
- Developed a PyTorch library for video-text retrieval which is benefiting the group members' research work

Software Engineer Intern, China Electronics Technology Group Corporation 10/2020 - 06/2021

- Involved in building a security visualization system for Sanxingdui using Cesium and Vue, responsible for displaying 3D models and visualizing sensor data
- Labeled ancient handwritten Chinese characters and generated OCR training files automatically using Python and Shell
- Developed a demo for a real time person pose estimation model

Game Engineer Intern, Banana Interactive, Shanghai, China 10/2019 - 05/2020

- Participated in the development and maintenance of 3 H5 games using JavaScript and Affinity Designer
- Completed the first release version of a H5 game independently
- Improved the readability of code through code refactoring and developed a skin system, shop system and item system for the other two games
- Ported a game packaging and deployment tool from Windows to Linux and macOS

Research Experience

Personalized Product Description Generation, Deecamp 2021 06/2021 - 08/2021

- Incorporated product attributes, personalized information and external knowledge to T5 pre-trained model using transformer and bidirectional attention to generate interesting and informative product descriptions
- Built the frontend of a fancy cross-platform website for interacting with our model using Vue and uni-app
- Won the **champion of the language track** in Deecamp 2021

Meta-Learning for Continual Learning, Peking University, Beijing

08/2020 - 01/2022

Advisor: Prof. [Tong Lin](#)

- Designed an efficient method for parameter importance estimation via Taylor expansion
- Proposed a fast meta-learning algorithm for continual learning problems, which expresses the gradient of meta-update in closed-form instead of using Hessian information, **accepted by IJCNN 2022**
- Outperformed SoTA methods while optimizing much more efficient in experiments on popular benchmarks

Food Image Aesthetic Captioning, Tongji University, Shanghai [\[Project Page\]](#)

03/2020 - 06/2020

Advisor: Prof. [Qinpei Zhao](#)

- Proposed a novel framework consisting of a single-attribute captioning module and an unsupervised text summarization module for generating aesthetic captions for food images, **published in ICTAI 2020**
- Designed a data filtering strategy inspired by TF-IDF method for building a [dataset](#) for this new task
- Introduced two new evaluation criteria to assess the novelty and diversity of the generated captions
- Outperformed baselines and existed methods substantially in terms of diversity, novelty and coherence

Fault Diagnosis for Microservice Architectures, Tongji University, Shanghai

09/2018 - 01/2019

- Represented the microservices of a cloud platform and the causal relationships between them by a Bayesian network against the observed performance metrics dynamically using PC algorithm
- Identified the culprit microservices when an anomaly occurred using random walk
- Outperformed traditional approaches with 6.56% accuracy improvement, without knowing the calling graph

Chatbot

10/2018 - 11/2018

Advisor: Dr. [Fan Zhang](#)

- Built a chatbot which can identify and analyze the intentions of users and provide stock and weather information using RasaNLU
- Achieved intention classification and named entity recognition based on SVM using spaCy and scikit-learn
- Allowed multi-turn dialogue and handling pending actions using finite state automaton
- Integrated the chatbot to WeChat and QQ for a better user interface

Semi-Supervised Machine Translation, Peking University, Beijing

07/2018 - 08/2018

Advisor: Prof. [Tong Lin](#)

- Proposed a dual learning framework based on shared hidden space to utilize the structure duality to boost the learning of two dual tasks and better regularize the model
- Designed two denoising auto-encoders consisting of encoders and decoders of two traditional Seq2Seq neural machine translators to make use of unpaired data
- Outperformed strong baselines by 1.0 - 2.9 BLEU on IWSLT'15 (English-Vietnamese) and WMT'14 (English-German), the improvement is more obvious when labeled data is little

Open-Source Projects

Flint: A toy deep learning framework implemented in Numpy from scratch [\[Github\]](#)

01/2021 - Present

- Implement an autograd engine, Linear, Convolution, Pooling, Flatten, RNN, Dropout and BatchNorm layers, 6 optimizers, 4 loss functions, 3 activation functions, 5 initializers and a data loader in pure Numpy
- Wrote complete documentation and comprehensive unit tests

Speech Emotion Recognition [\[Github\]](#)

04/2019 - 06/2019

- Implemented several models and features extracting methods for speech emotion recognition
- Achieved 7.2 - 12.2 accuracy improvement over baseline on four benchmark datasets: CASIA (Chinese), EMODB (German), SAVEE (English), and RAVDESS (English), got over 300 Github stars

Awards and Honors

Champion of Language Track, Deecamp

2021

Bronze, China Collegiate Programming Contest (CCPC)

2018

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| Honorable Mention , ACM International Collegiate Programming Contest (ICPC) Asia Regional | 2018 |
| Second Prize , Programming Contest of Tongji University | 2017, 2018 |
| Second Prize , China Mathematical Contest in Modeling (CUMCM) | 2017, 2018 |
| Second Prize , Programming Contest of East China Normal University | 2017 |

Leadership and Activities

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| Vice Chief Technology Officer & Chief Experience Officer , Tongji Microsoft Student Club | 2017 - 2019 |
| <ul style="list-style-type: none"> Participated in seminars and meetings Gave lectures about data structure and algorithms as well as their applications in machine learning | |
| Vice President , Baseball and Softball Association of Tongji University (Jiading campus) | 2018 - 2019 |
| Member of Softball Team of Tongji University | 2016 - 2019 |

Core Courses

- **Boston University**: Machine Learning, Image and Video Computing, Cryptography, Computational Tools for Data Science
- **Tongji University**: Probability and Mathematical Statistics, Discrete Mathematics, Calculus, Linear Algebra, Object-Oriented Programming, Data Structure, Algorithm, Operating Systems, Principles of Compilers, Database, SOA and Web Services, Distributed System, Web System and Technology, Design Patterns

Skills

Programming Languages: Python, JavaScript/TypeScript, HTML/CSS, Java, C/C++, MATLAB
Tools and Frameworks: Git, PyTorch, Keras, scikit-learn, Linux, Vue, React, Django, \LaTeX
Languages: Chinese (native), English (proficient, TOEFL: 106, GRE: 322)