

JIACHEN ZHAO

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Education

University of Massachusetts Amherst

Master of Science in Computer Science, GPA: 4.0/4.0

Sep 2022 – May 2024

Massachusetts, United States

Hong Kong University of Science and Technology

Bachelor of Engineering in Computer Science, First Class Honor

Sep 2018 – May 2022

Hong Kong SAR, China

Selected Research Projects

Few-shot parsing for biomedical texts

supervised by Prof. Andrew McCallum

Sep 2022 – Current

UMass Amherst, MA, US

- Focus on few-shot constituency parsing. Work on knowledge distillation from GPT-3 to a smaller applicable language model (i.e., T5).
- Proposed a “usefulness” score to decide what exemplars to retrieve for prompts of GPT-3, which is proven more effective than other methods on constituency parsing.
- Proposed confident student training with knowledge distillation (ConST-KD). ConST-KD can reduce overconfident mistakes in self-training due to noisy pseudo labels. With ConST-KD, the student model can outperform the teacher model and other strong baselines in few-shot settings and reach comparable results to standard fine-tuning with ten times more data.

Patella segmentation for the detection of osteoarthritis

Supervised by Prof. Hao Chen

June 2021 – October 2021

HKUST, Hong Kong SAR, China

- Worked independently on increasing the robustness and data-efficiency of Convolutional Neural Networks (CNNs) by leveraging Statistical Shape Model (SSM) for Patella segmentation.
- Implemented automated sampling and image registration to generate SSM. Proposed a metric for predicting whether CNN or SSM performs better with no access to ground truth. Proposed a fuzzy nearest-neighbor framework to integrate prior anatomical knowledge into CNN-based segmentation. It can correct the segmentation of CNNs and improve its robustness in the case of corrupted data.
- The proposal can increase the Dice coefficient of various mainstream CNN frameworks by around 1.7%. The tested models can achieve a comparable performance to standard supervised training with twice the data.

Work Experience

International Digital Economy Academy

Research Intern on NLP, supervised by Prof. Haiqin Yang

September 2021 – January 2022

Shenzhen, China

- IDEA is a research institute recently founded by Dr. Harry Shum. Worked in the department of CTO studio. Cooperated with an AI unicorn called Datastory to help them research and develop algorithms on event extraction.
- Worked on low-resource events detection that does not require the annotation of trigger words. Proposed to convert the classification task into a reading comprehension (RC) task. Proposed an events derangement module to resolve the imbalanced learning process. The performance on detecting minority events can be strengthened. Two patents are under registration.
- Trained the proposed model with real large-scale data collected by Datastory and applied the model to the company’s product for efficient events detection on large-scale real data from social medias. The cost of data annotation was greatly reduced.

Publications

Confident Student Training with Knowledge Distillation from Large Language Models for Few-shot Constituency Parsing

Jiachen Zhao, Yamini Kashyap, Mehek Tulsyan, Andrew Drozdov

submitted to ICML, 2023.

Adaptive Fusion of Deep Learning with Statistical Shape Model for Robust Patella Segmentation from CT Images

Jiachen Zhao, Tianshu Jiang, Yi Lin, Justin Chan, Ping-Keung Lewis Chan, Chunyi Wen, Hao Chen

submitted to Journal “Artificial Intelligence in Medicine” (IF= 7.011), received positive reviews, 2022. *link*

Trigger-free Event Detection via Derangement Reading Comprehension

Jiachen Zhao, Haiqin Yang

arXiv, 2022. *link*

Awards & Certificates

Mr. Armin and Mrs. Lillian Kitchell Undergraduate Research Award 2022

Certificate of Completion in Advanced Undergraduate Research Project 2022

Dean’s List for the School of Engineering in Fall 2018, Fall 2019

University’s Scholarship Scheme for Continuing Undergraduate Students in 2019 - 2020

Skills

Languages: Mandarin (Native), English (Advanced)

Programming Languages: Python, C++, Java, HTML/CSS, JavaScript

Frameworks/ libraries: PyTorch, Tensorflow, Numpy, Hugging Face, Keras, Scikit-learn