

Shujing Guo

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EDUCATION

Dalian University of Technology (DUT)

Dalian, China

Master candidate of Software Engineering

09/2021 - Present

GPA: 3.40/4.00 Average score: 84.37/100

Supervisor: Prof. Hong Yu

Henan University (HENU)

Kaifeng, China

Bachelor of Engineering in Software Engineering

09/2017 - 06/2021

GPA: 3.66/4.00 Average score: 87.39/100

RESEARCH INTERESTS

Multimodal learning, Natural Language Processing, Human-Computer Interaction, Trustworthy AI.

RESEARCH EXPERIENCE

Unsupervised Image Captioning

04/2023 - Present

New Idea based on Object-Centric Unsupervised Image Captioning

- Explored a novel Transformer-based network for Unsupervised Image Captioning which utilizes unpaired images and texts to train the model, and can effectively boost the object coverage of input image features.
- Given a sentence in the text dataset, harvesting objects corresponding to the sentence. Mined images which not only have the higher similarities to the given sentences but also contain certain objects. During training, the Transformer takes the set of object regions mined from the mined images as input. Calculate the Cross Entropy Loss between the predicted sentences and the original given sentences.
- Proposed a Feature Extension Network to expand the few object regions mined from the entire image dataset and to mimic complete region features extracted from real images' visual contents.
- The Feature Extension Network has already been trained and is trying to be embedded in the original network.

Supervised Image Captioning

02/2022 - 01/2023

Fusion Transformer for Image Captioning

02/2022 - 09/2022

- Explored a novel Fusion Transformer network to fuse two types of visual features (region and grid features) considering directional relationships between objects. This network effectively captures both high-level and fine-grained details in the images for purpose of generating more reasonable sentences.
- Proposed a modified Multi-Head Self-Attention which simultaneously contains relative directional relations, absolute and relative positional information to enhance the orientation perception between visual features.
- Applied a Fusion Attention to thoroughly integrate the two types of visual features with word representations in an interlaced way.
- Employed a Fusion Gate Operation module to provide sophisticated control for the forward propagation of multimodal information as well as their backpropagating gradients.

Further Improvement for Fusion Transformer

09/2022 - 01/2023

- Utilized segmentation features to substitute for the original region features as another visual information source. The segmentation features retain the spatial structure information of the original images and are easier to be fused with the grid features.
- The other modules in the network remain unchanged.
- Performed competitively on various evaluation metrics, e.g., 134.7 CIDEr on COCO Karpathy test split.

Crawling and Visualization Analysis System for Movie Website Data

01/2021 - 5/2021

- Designed a crawler and visualization analysis system which takes Douban Top250 Movies' information as research objects.

- Utilized XML Path Language to crawl basic information and short comments of classic movies on the List, and store the information into a database.
- Obtained the target data from the database and filtered the short comments by constructing a stop word dictionary and an emotional dictionary. Then the Naive Bayes model is used to classify the sentiment of short comments.
- Realized the visual statistical display of the basic information and short comments of movies through Apache ECharts.

TEACHING EXPERIENCE

Teaching Assistant C++ Object-Oriented Programming	03/2022 - 04/2022
Teaching Assistant Data Structures	09/2021 - 10/2021

SCHOLARSHIP & AWARDS

• Postgraduate Scholarship (full tuition fee, 2 times)	School level	2021 - 2022
• Outstanding graduates	School level	2021
• Henan University Scholarship (4 times)	School level	2017 - 2021
• Outstanding Student Scholarship (4 times)	School level	2017 - 2021
• 1st Prize of Henan University in the 13th Chinese Collegiate Computing Competition	School level	2020
• 1st Prize of the women's group Jumping Jacks at Henan University Sports Meet	School level	2020
• 3rd Price in Mathematics Competition (Non-Mathematics Majors)	School level	2018
• ACAA China Digital Arts Designer Professional certificate	National level	2018
• Excellent Award of the 1st Oracle Cup Web Design Competition of School of Software	College level	2017

LANGUAGES & SKILLS

- **Languages:** Mandarin (Native), English (TOEFL: prepared; CET6: 523, CET4: 602).
- **Technology (and Tools):** Python, Java, C++, Linux, SQL, HTML5, JavaScript, Bootstrap, MySQL, SQL server, MongoDB, Nginx Web, UI design, Adobe Photoshop, Microsoft Office (Word, Excel, and PowerPoint), EndNote, and so on.