# Shujing Guo

## Personal Information

Shujing Guo
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Dalian, China

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GitHub: https://github.com/ShujingGuo
Website: https://shujingguo.github.io/
TOEFL: prepared
CET4: 602
CET6: 523

## Education

**09/2021 – Present**   **Master Candidate of Software Engineering**
Dalian University of Technology, Dalian, China
GPA:3.40/4.00    Average score: 84.37/100
Advisor: Prof. Hong Yu

**09/2017 – 06/2021**   **Bachelor of Engineering in Software Engineering**
Henan University, Kaifeng, China
GPA:3.66/4.00    Average score: 87.39/100

## Research Interest

Machine Learning, Deep Learning

Multimodal Learning, Image Captioning

Natural Language Processing, Human-Computer Interaction, Trustworthy AI

## Research Experience

**04/2023 – Present**   **New Idea based on Object-Centric Unsupervised Image Captioning**

- Proposed 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.
- Mined images from the MS-COCO dataset which not only have the higher similarities to the given sentences but also contain certain objects corresponding to the sentences.
- Proposed a *feature extension network* to expand the few object regions extracted from the mined images and to mimic complete region features extracted from real images' visual contents.

- Fed the expanded region features into the transformer network for generating predicted sentences.
- The feature extension network has already been trained and is trying to be embedded in the original network.

02/2022 – 09/2022    **Fusion Transformer for Supervised Image Captioning**

- Proposed a *novel fusion transformer network* to fuse two types of visual features (region and grid features) considering multi-angle spatial relationships between objects.
- Devised a *modified multi-head self-attention* that simultaneously contains relative directional relations, absolute information and relative positional information to enhance the orientation perception between visual features.
- Implemented 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.

09/2022 - 01/2023    **Further Improvement for Fusion Transformer**

- Utilized *segmentation features*, which retains the spatial structure information of the original image, to substitute the original region features in order to be fused with the grid features more easily.
- Performed competitively on various evaluation metrics, e.g., **134.7 CIDEr** on COCO Karpathy test split.

01/2021 - 5/2021    **Crawling and Visualization Analysis System for Movie Website Data**

- 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.
- Employed the Naive Bayes model to classify the sentiment of short comments.
- Implemented the visual statistical display of the basic information and short comments of movies through Apache ECharts.

TEACHING EXPERIENCE

03/2022 – 04/2022    Dalian University of Technology, Dalian, China
                      *Teaching Assistant*

- Acted as teaching assistant for **C++ Object-Oriented Programming** class, held office hours each week helping students with programming assignments and questions about the content from the lecture.
- Assisted Professor grade assignments, exams and gave feedback to students.

09/2021 – 10/2021    Dalian University of Technology, Dalian, China
*Teaching Assistant*

- Acted as teaching assistant for **Data Structures** class, held office hours each week helping students with programming assignments.
- Assisted Professor grade assignments, exams and gave feedback to students.

## HONORS, AWARDS & SCHOLARSHIPS

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|---|---|
| 2021 – 2022 | Postgraduate Scholarship (full tuition fee, 2 times), School level |
| 2021 | Outstanding graduates (20%), School level |
| 2017 - 2021 | Henan University Scholarship (4 times), School level |
| 2017 - 2021 | Outstanding Student Scholarship (4 times), School level |
| 2020 | 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 |
| 2018 | 3rd Price in Mathematics Competition (Non-Mathematics Majors), School level |
| 2018 | ACAA China Digital Arts Designer Professional certificate, National level |
| 2017 | Excellent Award of the 1st Oracle Cup Web Design Competition of School of Software, College level |
| 2016 | Outstanding Certificate of International Vocal Music Examination of Shanghai Conservatory of Music in Highest level, National Level |

## LANGUAGES AND SKILLS

- **Languages**: Mandarin (Native), English (TOEFL: prepared; CET6: 523, CET4: 602).

- **Skills**: Python, Pytorch, Deep Learning, Java, C++, JavaScript, Bootstrap, HTML, CSS, SQL, Linux command, Typescript, UI design, Adobe Photoshop, Microsoft Office (Word, Excel, and PowerPoint), EndNote, and so on.