Shujing Guo

Personal Information

Shujing Guo
Illinois Institute of Technology (IIT)
(Enrollment in Fall 2024)
Chicago, IL, USA
majoring in Computer Science

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Education

08/2024 – Present **Illinois Institute of Technology, Computer Science**
PhD student in Computer Science. This is my first semester studying in IIT.
My previous advisor is Prof. Yan Yan.

09/2021 – 06/2024 **Master of Software Engineering**
Dalian University of Technology, Dalian, China
GPA:3.40/4.00 Average score: 84.37/100

09/2017 – 06/2021 **Bachelor of 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;
Human-AI interactions;

Research Experience

04/2023 – 02/2024 **Unsupervised Image Captioning Method Based on the Extension of Object Features**

- Proposed an unsupervised image captioning method based on *object feature extension* to address the problem of insufficient object features when constructing pseudo image-caption data.
- Mined images from the MS-COCO dataset which contain certain objects corresponding to the sentences.

- Proposed a novel *object feature extension network* to expand the original small amount of object features and construct a complete pseudo image feature that matches the given text, effectively enriching the object visual information in the task of unsupervised image captioning.
- Fed the expanded object features into the *transformer network* for generating predicted sentences.
- This method effectively improves the quality of the captioning model, enabling it to achieve optimal performance in most evaluation metrics.

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.

Teaching Experience

08/2024 – Present Illinois Institute of Technology, Chicago, IL, USA
Teaching Assistant

- Acted as teaching assistant for CS 201-Accelerated Introduction to Computer Science (Java Programming), 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.

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

2021 - 2023	Postgraduate Scholarship (full tuition fee, 3 times), School level
2021	Outstanding graduates (top 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**: Chinese (Native), English.
- **Skills**: Python, Java, C++, Unity 3D, UI design, JavaScript, Bootstrap, HTML, CSS, SQL, Adobe Photoshop, Microsoft Office (Word, Excel, and PowerPoint), EndNote, and so on.