

Kaiwei Cen

EDUCATION

Utrecht University

MSc in Artificial Intelligence GPA: 7.48/10

- Related Coursework: Research Internship AI I(8), Research Internship AI II(8.5), Natural Language Processing(8), Advanced Machine Learning (7.5), Reasoning about Meaning in Linguistic Communication(7.5)

Utrecht, Netherlands

Sept. 2021 – Present

Foshan University

B.E in Network Engineering (Internet of Things track)

Foshan, China

Sept. 2016 – July 2020

RESEARCH EXPERIENCE

Probing scene information in different layers of VisualBERT

Supervised by Dr. Albert Gatt and Michele Cafagna

Mar. 2022 – Sept. 2022

Utrecht University, Netherlands

- Used an image caption dataset to test the ability of VL models to align scene captions with images, and found single stream VL models outperform dual stream VL models, mainly due to differences in the visual part of their initial embeddings.
- Compared the performance of VL models to align scene captions and captions in the Microsoft COCO Caption dataset with images. The accuracy of aligning MS COCO captions is higher than scene captions for all VL models, possibly due to the higher stylistic similarity between MS COCO captions and the captions used for pre-training VL models compared to scene captions.
- Conducted an experiment to know which kind of caption is preferred by VL models to describe images. MS COCO captions are preferred by VL models to describe the image than using scene captions to describe images.
- Proposed a probing task on each layer of VisualBERT which performs the best in aligning scene captions with images, to know whether there is scene information encoded in its embedding. Found that deeper layers contain more scene information than the lower layers in VisualBERT.

Comparing the performance of BERT on Multilingual SRL datasets

Supervised by Dr. Tejaswini Deoskar

Nov. 2021 – Mar. 2022

Utrecht University, Netherlands

- Applied BERT on the Chinese Proposition Bank 1.0 dataset and the English Universal Proposition Bank dataset. The model only uses sentence-predicate pairs as the input feature but outperforms the traditional methods which heavily rely on feature engineering.
- Conducted a quantitative analysis on the performance of the model on the aforementioned datasets.
- Conducted a comparative analysis on the model's differing performance in semantic role label classification on the two aforementioned datasets.

BACHELOR THESIS

Intelligent Question Answering System for Administrative Service

Supervised by Professor Weigang Guo, won the excellent bachelor thesis award

Jul. 2018 – Apr. 2020

Foshan University, China

- Knowledge graph construction: applied the BERT-BiLSTM-CRF model for entity extraction and relation extraction on the governmental data crawled on the web. Constructed a knowledge graph with 210823 entities, 657372 relationships, and 23862 attributes using Neo4j based on the extracted data.
- Question-answering system development: used the BERT-BiLSTM-CRF model to recognize governmental entities in the input questions and match the input question to the most semantically similar relation in the knowledge graph.
- The accuracy of the question-answering system is 80.02%, 10% higher than the former version of the Guangdong governmental question-answering system.

COMPETITION

Open-domain Question Answering System in Chinese

The 6th Teddy Cup National Data Mining Competition

Jan. 2018 – Jun. 2018

Foshan University, China

- Used the CNN-LSTM attention model to extract the semantic meaning of input questions. Designed an attention mechanism to integrate the semantics of the factual part into the understanding of the core question, which can increase the similarity of the semantic meaning of input question and the correct answer. Compared to the model without the attention mechanism, the precision was improved by 6.7%.

TECHNICAL SKILLS

Deep learning models: UNITER, LXMERT, VisualBERT, VL-BERT, BERT, Transformer

Explainable AI techniques: SHAP

Deep learning framework: PyTorch