Shanxiu He

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RESEARCH INTERESTS

Natural Language Processing: Text Generation, Event Process Completion, Vision and Language Models

EDUCATION

University of California, Los Angeles   Sep. 2018 - Jun. 2022
B.S., Computer Science, Minor in Statistics (GPA: 3.845)

WORK EXPERIENCE

NLP Research Intern, USC ISI   Jun. 2021 - Sep. 2021
Advisor: Prof. Jonathan May and Prof. Muhao Chen
Location: Los Angeles, CA

- *Goal-Oriented Event Chain Generation*
  Implemented three large language models (GPT2, T5 and BART) to perform event chain sequences generation. On average, the models outperformed the state-of-the-art statistical baseline by 3% on E-ROUGE scores. Proved the generated event sequences helpful to text generation domain in a zero-shot setting. Planned to submit to NAACL conference in 2022.
  Talk Link: From Constrained Event Sequences Generation to Text Generation

Engineering Intern at FENDA Technology   Jan. 2018 - Feb. 2018
Location: Shenzhen, China

- Developed new prototypes for user interfaces for the company's smart watches. Researched the potential developments using deep learning to design personalized smart watches.

RESEARCH EXPERIENCE

NLP Researcher, UCLA-NLP   Dec. 2019 - Present
Advisor: Prof. Kai-Wei Chang

- *Grounded Situation Recognition with Vision and Language Models*
  Targeted Grounded Situation Recognition (SWiG datasets) with two types of Vision and Language Models. CLIP-based model exceeded traditional computer vision models. Traditional Vision and Language approach matches previous baselines on noun predictions with 63.33% accuracy given ground truth verb while demanding much less computation costs.
  Notes: Grounded Situation Recognition with Vision and Language Models

- *Probing Vokenization*
  Evaluated the possible bias in vokenization paper for exploiting its additional supervision with pre-trained BERT weights. Analyzed the advantages brought by purely image priors if excluding the rich pre-trained information from BERT.

- *Probing Vision and Language Models*
  Examined additional cross attention layers in LXMERT. Extracted visual and text hidden representations to perform visual Semantic Role Labeling. Concluded concluded the additional layers might not always be beneficial.

ML Researcher, UCLA Scalable Analytics Institute   Jan. 2021 - Jun. 2021
Advisor: Prof. Yizhou Sun

- *Graph Transformer*
  Implemented Graph-Transformer architecture to represent edge level information as positional encodings to graphs. Developed strategies for Graph-Transformer such as connectivity and eigenvalue similarity. Initial results achieved 0.77 ROCAUC score on validation time.
- *OGB Dataset Development*
  Examined possible datasets and tasks to examine expressiveness and robustness of existing GNNs.

Research Collaborator, Columbia DVMM lab   Mar. 2020 - Sep. 2020
Advisor: Prof. Shih-Fu Chang and Prof. Kai-Wei Chang
- *LXMERT with Scene Graph Generation*
  Coordinated in generating pre-training datasets for Vision and Language models via Scene Graph Generation. Collaborated with Ph.D. students on adding Scene Graph Generation as an additional supervision to existing models.

Research Science Initiative at Tsinghua University   Jun. 2017 - Aug. 2017
Advisor: Prof. Jun Zhu
- *SAN VQA Model*
  Formulated VQA models based on CNN+BILSTM+SAN network with Tensorflow. The model outperformed counterparts by 5% test time accuracy with DAQUAR, COCO-QA and VQA datasets.

COURSE PROJECTS

Improving and Probing Unified Vision-and-language Representation Model
Mentor: Prof. Kai-Wei Chang
Description: Since Cross Attention layers might not fully grasp information from both vision and language, our project group proposed a relationship-aware Vision and Language model with additional objectives, especially Scene Graph Generation and observed increases in performance for VQA.
Notes: VL Model Presentation

GNN Adversarial Training
Mentor: Prof. Yizhou Sun
Description: While GNNs are susceptible to adversarial attacks, we design mechanisms to perturb edge connections for GNN representations. The perturbed models beat traditional adversarial approach in performances both on clean accuracy and adversarial accuracy.

On the Difficulty of Utilizing Commonsense Knowledge
Mentor: Prof. Kai-Wei Chang
Description: We investigated the difficulties to ground commonsense knowledge in databases, such as ATOMIC and ASER. After showing the severity of finding useful information, we improved the performance in SocialIQA, a social event dataset, with a trainable retriever.

TECHNOLOGY SKILLS

Programming Languages: Python, R, Java, C++, C.
Technologies: Docker, Tmux, LaTeX.
Machine Learning: PyTorch, PyTorch Geometric, Tensorflow, Numpy, SciPy.

HONORS

International Contest China Region Finalist Award, The 3rd Annual IMMC
Upsilon Pi Epsilon, Honor Society for the Computing and Information Disciplines
Dean's Honors List

COURSEWORK Graduate-level Coursework at UCLA:
CS269: Special Topic in Artificial Intelligence: Fairness, Ethics, Accountability and
Transparency in Natural Language Processing
CS263: Natural Language Processing
CS249: Graph Neural Networks
CS199: Directed Research (from Spring 2020 to Spring 2021)