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Zeyu Zhang

Natural Language Processing, Machine Learning and Artificial Intelligence

Education

University of Arizona, Tucson, AZ, USA
PhD, Research Assistant, School of Information, *Jul' 19 - Present*
GPA: 4.0/4.0 (Present)

University of Pittsburgh, Pittsburgh, PA, USA
Master of Science, Information Science, *Aug' 17 - Apr' 19*
GPA: 3.89/4.0 (Overall)

Beijing Technology & Business University, Beijing, CHN
Bachelor of Engineering, Information Engineering, *Sep' 13 - Jun' 17*
GPA: 3.68/4.0 (Overall)

Awards & Achievements

Awarded **First-Class Scholarship** and **Title of Beijing Outstanding Graduate** *Jun '17*
Awarded **First-Class Scholarship** and **Title of Three-Good Student** *Sep '16*
Awarded **First-Class Scholarship**, **Title of Excellent Student** and **Title of Outstanding Student Leader** *Sep '15*
Awarded **Title of Excellent Individual in Summer Social Practice** *Aug '14*

Publications

Dongfang Xu, **Zeyu Zhang** and Steven Bethard. "A Generate-and-Rank Framework with Semantic Type Regularization for Biomedical Concept Normalization" **Under review in ACL 2020**

Smith Hannah, **Zeyu Zhang**, John Culnan, and Peter Jansen. "ScienceExamCER: A High-Density Fine-Grained Science-Domain Corpus for Common Entity Recognition" arXiv preprint arXiv:1911.10436 (2019). **Accepted to LREC 2020**

Yu Chongchong, Cao Lei, Yin Weibin, **Zhang Zeyu**, Zheng Ya, "Research on Automatic Word Segmentation Methods of Lizu Spoken Annotation Corpus." In: *Application Research of Computers (Chinese Journal)*, Volume 34, No. 5, Page: 1, May, 2017.

Wu Jingzhu, Liu Qian, Chen Yan, Sun Lijuan, **Zhang Zeyu** "Study on the Wheat Seeds Multi-index Testing Methods Based on the Near Infrared and High Spectrum Technology." In: *Transducer and Microsystem (Chinese Journal)*, Volume 35, No. 7, Pages: 42-44, 2016.

Research Experience

Multi-Hop Inference Explanation Regeneration based on WorldTree Dataset
Supervisor: Prof. Peter Jansen *Sep '19 - Now*

- Reformat this task as next sentence prediction based on BERT and its performance can achieve the 51% MAP (improved 20% than the baseline model).
- Built a Science-domain common entity tagger based on pre-trained BERT to generate entity labels for nearly every content words.
- Exploring how to utilize the entity information to help the explanation regeneration.

Reading Comprehension Q&A System for Unanswerable Questions Based on Global Self-Attention
Supervisor: Prof. Rebecca Hwa *Sep '18 - Jan '19*

- Reproduced the global self-attention model QANet and Created one available *noisy-robust loss function* to deal with unanswerable questions
- Added the *max-margin loss function* to enable the model to clearly differentiate unanswerable cases
- Replaced the convolution layer with the *local self-attention* and utilized the *multi-level self-attention* instead of the one-level self-attention to improve the ability of semantics understanding
- Currently Performance: SQuAD 2.0 Dataset: **exact match: 67.01%(improved 7% than base model)** and **f1 score: 69.26%(improved 5% than base model)**

Automatic Q&A System with Reading Comprehension Based on Tree-LSTM
Supervisor: Prof. Daqing He *Feb '18 - May '18*

- Reimplemented the chain-of-trees LSTM(CT-LSTM) and tree-guided attention mechanisms to generate and represent the candidate answers
- Devised a *tree-LSTM batch processing mechanism* to solve the problem that tree-LSTM could not encode multiple contexts in one batch
- Introduced the *dynamic memory network(DMN)* to improve the semantics reasoning ability
- Performance: bAbI Dataset: **mean accuracy** of 20 tasks: **97%(improved 2%** than original model)

Search-Based Medical Automatic Q&A System
Supervisor: Prof. Chongchong Yu *Feb '17 - Jun '17*

- Utilized the convolution neural network (CNN) to represent the semantics
- Built one loss function based on *cosine similarities* to implementing the semantics matching
- Performance: test **precision**: **64.3%**

Internship Experience

Object Detection of Traffic Signs Based on Camera Pictures
Deep Learning Research Intern | Baidu Autonomous Driving Unit(ADU) *May '18 - Jun '18*

- Preprocessed the dataset by filtering small targets, upsampling, downsampling and data augmentation to make it balanced and reduce noisy labels
- Developed one object detection model based on YOLO v3 by modifying the original structure and loss function to improve the detection performance
- Performance: the **precision** and **recall** of all categories both are more than **80%**.(most than **90%**)

Weakly Supervised Photo Enhancement for Evening Scene
Deep Learning Research Intern | Baidu Autonomous Driving Unit(ADU) *Jul '18 - Aug '18*

- Obtained the unpaired and unaligned photos for the daytime and nighttime
- Modified the discriminator loss function of the original CycleGAN and added three more loss functions based on the content, texture, and color of the photos in order to reduce photo distortion
- Performance: enhanced photos from nighttime to daytime without distortion and local blurs

Computer Skills

Languages: Python, Scala, Java, C, Matlab
Deep Learning Frameworks: Pytorch, Tensorflow
Operating Systems: Linux, Mac OS, Windows

Extra-cirrucular activities

Team Leader; Won the **First Prize** in the eighth "Challenge-Cup" Capital College Students Extracurricular Academic Science and Technology Works Competition *Jun '15*
Participant; Won the **First Prize** in the Sixth "Blue-Ridge-Cup" National Software and Information Technology Professional Talent Competition *May '15*
Participant; Won the **National First Prize** in the ninth "Bochuang-Cup" National College Students Embedded Design Competition *Jan '15*
Team Leader; Won the **National Third Runner-up** in 2015 China Robotics Competition and Robo-Cup Open Tournament Service Robot Project *Dec '14*