Haoran Xu

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Education

Johns Hopkins University (JHU) Baltimore, USA
Master of Science - Computer Science; GPA: 3.9/4.0 Sep 2019 - Present
Concentration on Human Language Technology (HLT)

University of Illinois at Chicago (UIC, 3+2 exchange program) Chicago, USA
Master of Science - Electronic and Computer Engineering; GPA: 3.9/4.0 Sep 2017 - May 2019

East China University of Science and Technology (ECUST) Shanghai, China
Bachelor of Engineering - Information Engineering; Ranking: 1/90 Sep 2014 - July 2018

Main coursework: Nature Language Processing, Machine Learning, Human Language Technology, Algorithms, Pattern Recognition, Neural Networks, Computer Vision

Research area: Multilingual Word Embedding, Cross-Lingual Transfer Learning, Machine Translation

Research Experience

Better Extraction from Text Towards Enhanced Retrieval Program Research Intern
Center for Language and Speech Processing, mentors: Benjamin Van Durme, Mark Dredze May 2020 - Present

- Proposed a novel data augmentation approach for domain adaptation, which surpassed state-of-the-art performance in *dialogue state tracking* and *event extraction* tasks.
- Cooperated with the team in cross-lingual transfer tasks.
- Submitted to EACL 2021 as the first author.

Zero-Shot Cross-Lingual Dependency Parsing Research Assistant
Center for Language and Speech Processing, advised by Philipp Koehn, JHU May 2020 - Sep 2020

- Investigated a zero-shot approach for dependency parsing by building a multilingual concept-shared semantic space, which achieved state-of-the-art performance.
- Submitted to EACL 2021 as the first author

Cross-Lingual Contextual Embedding Spaces Mapping Research Assistant
Center for Language and Speech Processing, advised by Philipp Koehn, JHU Sep 2019 - May 2020

- Proposed a novel method of contextual embedding mapping, which outperformed static embedding alignement approach by approximate 10% accuracy on bilingual dictionay induction task.
- Revealed the tight relationship of isotropy, isometry and isomorphsim in contextual embedding spaces.
- Submitted to EACL 2021 as the first author.

Efficient Quadratic Programming in Wireless Communication Research Assistant
Waveform Optimization Lab, advised by Mojtaba Soltanalian, UIC Nov 2018 - Mar 2019

- Developed a new algorithm to reduce the peak energy of data transmission based on *Unimodular Quadratic Programming*, and achieved higher stability and faster convergence rate than existing methods.

Projects

Image Expansion with GANs Team Leader
Science and Engineering Laboratory, UIC Jan 2019 - May 2019

- Built a deep learning method based on *GAN* to naturally predict and expand the boundaries of incomplete images.
- Designed an encoding-decoding convolutional neural network partially composed of dilated convolution to render the extended image acquire better realism and conform to the semantics of the whole image.
- Replaced traditional global discriminator with local discriminator to reduce the blur of the vertical part of the image and enhance the authenticity.

Invisible Signature Security Device Team Leader
Science and Engineering Laboratory, UIC Jan 2018 - May 2018

- Created GUI interface and local database for human-computer interaction, which allowed users to sign their names in the air to implement signature recognition.
- Utilized *DTW+K-NN (Dynamic Time Warping + K-Nearest Neighbours)* algorithms and high-dimension dynamic features to recognize the signature with high precision.
- Received the Winner Award in 2018 Expo at UIC and the Best Research Paper Award at ECUST.

Honors and Awards Top 5

- Best Research Paper Award ECUST - 2018
- Expo 2018 Best in Category Award UIC - 2018
- First-class Scholarship (top 2%-ranked student) ECUST - 2015, 2016, 2018
- Second-class Social Work Award (received for community contribution) ECUST - 2015, 2016, 2018
- Excellent Student Award (top 5%-ranked student) ECUST - 2015

Skills

Programming Languages: Python, MATLAB, C, bash, C++, Java, LaTeX, SQL
Toolkits and Libraries: PyTorch, Allennlp, NLTK, Keras, Tensorflow, Mosesdecoder, Sklearn, PyQt, MySQLdb