HUIMING WANG

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EDUCATION

Zhejiang University (ZJU) *Sep. 2016 – Present*

Double Major: B.Eng., Computer Science and B.Eng., Biosystems Engineering

- **GPA:** (Overall) 3.73/4.00 (84.83/100.00), (CS) 3.88/4.00 (86.92/100)
- **CS Core Courses:** C/Python/Java Programming, Discrete Mathematics and its Application, Fundamental of Data Structures, Digital Logic Design, Object-oriented Programming, Advanced Data Structure and Algorithm Analysis, Database Systems, Operating System, Fundamental of Computer Software, Software Development, Machine Learning, Natural Language Processing
- **Mathematics Core Courses:** Calculus, Linear Algebra, Mathematical Statistics, Probability Theory, Ordinary Differential Equations, Complex Analysis and Laplace Transformation, Partial Differential Equations, Mathematical Modeling (H), Computer Simulation (Monte Carlo method, etc.), Numerical Analysis

PREPRINTS & PUBLICATIONS

- One paper as co-first author *under review of **ACL-21***.

RESEARCH EXPERIENCE

INTERESTS:

- **Machine Learning:** Adversarial Training, Semi-supervised Learning, Optimization
- **Natural Language Processing:** Named Entity Recognition, Relation Extraction, Semantic Parsing

StatNLP | ISTD Pillar | Singapore University of Technology and Design (SUTD) *Aug. 2019 – Present*

*Research Intern, advised by Professor **Wei Lu***

(1) Learning Better Representations for Semi-Supervised Relation Extraction

- ✓ We presented a novel multi-level contrastive learning method that was able to learn better three-levels representations for Semi-Supervised Relation Extraction.
- ✓ To enhance the model's capability in representation learning from unlabeled data, we further presented a novel iterative knowledge distillation method. We showed that such a joint and interactive learning approach was able to yield more meaningful representations.
- ✓ We conducted extensively quantitative and qualitative experiments on several standard bench-mark datasets. Results confirm the effectiveness of our approach under various SSRE settings

(2) Learning New Entity Type Recognition with Fine-Grained Latent LSTM-CRF

- ✓ We introduced two types of shared structures: shared encoding and shared negation among different entity types which can help with finding the relation with rare type and other entity types.
- ✓ Motivated by these shared structures, we further proposed a shared-attribute conditional random fields (CRF) model in which these shared structures were represented as latent attributes. The proposed model was able to capture the interactions among the shared structures by using hyperedges to connect the latent attributes and experimental results demonstrated the capability of the proposed model for improving the performance of the new entity types without external knowledge.
- ✓ We also came out a framework to deal with low-resource tasks under most scenarios.

AgroOptics and Imaging Lab | Dept. of Biosystems Engineering | ZJU *Jul. 2020 – Present*

*Graduation Project, advised by Professor **Haiyan Cen***

(1) Phenotype Analysis of Plants Based on UAV Remote Sensing

- ✓ We evaluated the potential of UAV-based image data for plants growth monitoring and compared the performance of spectral and structural information in estimating grain yield at different growth stages.
- ✓ We investigated the feasibility of data fusion to improve prediction of grain yield and validated the robustness of the prediction model between two years with model transfer.
- ✓ We also developed a UAV images pre-processing platform which could automatically finish the whole preprocessing work flow including image splitting, spectral and reflectance calibration and images stitching.

Digital Media Computing & Design Lab | Dept. of Computer Science | ZJU *Jan. 2019 – May. 2020*

*Research Assistant, advised by Professor **Siliang Tang***

(1) Multilingual Parsing from Raw Text to Universal Dependencies

- ✓ Tried to learn syntactic dependency parsers that could work in a real-world setting, and started from raw text, and that can work over many typologically different languages, even low-resource languages for which there was little or no training data, by exploiting a common syntactic annotation standard

(2) Fact Extraction and Verification

- ✓ Built baselines using the highest scoring systems. Then we generated adversarial examples to fool the existing systems. Finally, we incorporated the new data generated by the *Breakers* to improve the systems' classification performance. (Whole task was built upon work in a *Build it Break it Fix it* setting)

Digital Media Computing & Design Lab | Dept. of Computer Science | ZJU *Mar. 2018 – May. 2019*

*Research Assistant, advised by Professor **Yueting Zhuang***

(1) Speech Text Alignment Based on Neural Machine Translation Model

- ✓ Baseline: Trained an acoustic model with the audio data of Chinese. Used text to train a LM and then decoded the audio to obtain time information of words and sentences. Calculated the distance of the original text with generated text and did the alignment. And this baseline system only got an accuracy of 53%.
- ✓ Used MT based model and built a system which had an "encoder-decoder" architecture where a sequence of an input audio was projected into a continuous low dimensional space and the output sequence was generated from this representation and alignment was done soon after the output sequence is generated. This end-to-end speech-to-text alignment got an accuracy of 75%. (Attention based model)

WORK EXPERIENCE

Eigen Technology Co., Ltd. *Jul. 2018 – Sep. 2018*

Natural Language Processing Algorithms Intern

- ✓ Learned the use of flask development frameworks such as flask and sqlalchemy, responsible for the architectural design, functional development and code maintenance of the company's application system background;
- ✓ Participated in the development of the company's internal management personnel management OA system and officially launched as a core member of the project; Joined in the development and optimization of the related model of Eigen Technology Machine Learning, redeveloped the algorithms and experiments in the papers, and became familiar with the basic algorithms of machine learning and their Python programming.

Oracle (China) Software Systems Co., Ltd. *Mar. 2018 – Jul. 2018*

Big Data Development Intern & Solutions Specialist Intern

- ✓ Used the basic knowledge of database design, NoSQL and distributed computing to gain insight and prediction of massive data through data mining
- ✓ Used knowledge of various Oracle databases, PL/SQL usage and the application of Java and Python in database management to help build an online Oracle Big Data Automation Management Platform which could be used in automatic cleaning, inspection and performance monitoring of data through software system, and extract data for the training of deep neural networks;
- ✓ Managed the schedule of project using Oracle's project management solution P6 and participate in the development of project management solutions, dedicated to managing project portfolios, controlling costs, and managing cross-project writing and communication; Worked with the project manager to create a software development lifecycle using Primavera P6, covering the pre-project, documentation, development, commissioning, handover, testing, and product lifecycle phases, and participating in a real-world development. Clarified the entire process of software development

SELECTED OPEN-SOURCE PROJECTS

Operating System (MIPS SDK on C) [code]

- ✓ Developed an Operating System on FPGA-based hardware (supporting MIPS instructions).
- ✓ Designed the complete fair schedule (CFS) for process scheduling, system calls, and loading user programs.

Mini Database Design [code]

- ✓ Implemented a SQL database engine using B+ trees and supported storing and loading of the data.

- ✓ Simulated the MySQL database using minimizing codes (less than 2, 000 lines).

Book Management System [code]

- ✓ Used PHP to design a GUI program of book management system for libraries.
- ✓ Included new features (e.g. navigation bar, acrylic design) first introduced in Windows Fall Creator

Movie Box Office Prediction System [code]

- ✓ Crawled movie information from multiple domestic and international movie websites through crawler technology, and converted text information into a digital matrix for processing calculations
- ✓ Completed the implementation of the neuron class and built a three-layer neural network for calculation. Finally, the box office information could be predicted by several different pieces of information (movie type, director, actor popularity, etc.) and achieved an accuracy of 82% (the rate is obtained by the size of the 10,000 test box office deviations).

SELECTED HONORS

- **Zhejiang Provincial Government Scholarship,** *Top 2% Provincewide* *2017*
- **Tang Zhongying Scholarship,** *Top40 out of 6673 undergraduates, Lifetime honor* *2017*
- **First-Class Scholarship for Excellence in Research and Innovation** *2018 & 2019*
- **National Innovation Training Research Project,** *Top 20 out of 500+ SRTP projects of ZJU* *2018*
- **Second-Class Scholarship for Outstanding Students,** *Top12% Uni-wide* *2017*
- **Second-Class Scholarship for Academic Excellence,** *Top12% Uni-wide* *2017*
- **Outstanding Student Leader Awards** *2017 & 2018*
- **Meritorious Winner in MCM/ICM, USA** *2019*
- **Honorable Mention in MCM/ICM, USA** *2018*

ADDITIONAL INFORMATION

Extracurricular Experiences

- Leader of ZJU Caring-Heart Club
- Five-star Volunteer of ZJU

Hobbies

- Reading, playing the piano, listening to music and watching movies