Why are you interested in conducting research with these faculty? Provide your interests for each faculty member you listed above. \*

Professor Jingbo Shang’s research on Natural Language Processing, Text Mining, Information Extraction and Structured Mining in Large-Scale Text-Rich Networks

Professor Zhiting Hu’s research on Natural Language Processing, structure Knowledge and text generation.

[1] Chi W, **Feng X(\*euqal contribution),** Chen Y, et al. Stress Prediction Based on Multi-Granularity Linguistic Knowledge. IEEE International Conference on Acoustics, Speech and Signal Processing International Conference on Pattern Recognition and Machine Learning, 2023(ICASSP’23, under review)

[2] Zhang J, **Feng X**, Chen Y, et al. Prosody Prediction with Discriminative Representation Method. International Conference on Pattern Recognition and Machine Learning, 2022(PRML’22)

[3] Wang Z, **Feng X**, Tang J, et al. Deep Knowledge Tracing with Side Information. International conference on artificial intelligence in education.Springer, Cham, 2019(AIED’19).   
[4] **Feng X**, Xie R, Sheng J, et al. Population statistics algorithm based on MobileNet. Journal of Physics: Conference Series. IOP Publishing, 2019(ICSP’19)

[5] Rong Xie, **Feng X** A method of quick edge detection based on Zynq. International Conference on Cloud Computing and Internet of Things, 2018(CCIOT’18)  
[6] Sheng J, **Feng X** Research on the Internet of Things Platform for Smart and Environmental Protection. International Conference on Cloud Computing and Intelligence Systems, 2018(CCIS’18)

patents: CN111078898A, CN110970013A, CN111145724A, CN111079428A, CN111178042A

Research Experience

[Jul. 2019 - Present] Mobvoi AI Lab, Senior Speech Engineer, I have mainly been focused on text information extraction of text-to-speech on multi- and cross- lingual domain, including semantic NLP and emotional NLP. I working as a mentor (3 interns), co-developer, and researcher. Key results: (1) online server application (algorithm interface) (1000K+users) (2) one regular staff opportunity for my intern (3) co-author submission to PRML (intern) + five patents (4) first-author submission to ICASSP + two patents(reviewing).

[Aug. 2018 - Dec. 2018] TAL AI Lab, Algorithm Research Intern, I did research on deep knowledge tracing based on question-answer series. I worked as a researcher. Key results: (1) Outstanding Intern (2) regular staff opportunity (3) co-author submission to AIED (with Ph.D. Wang).

[Jun. 2018 - Aug. 2018] DeeCamp AI Lab, Research Team Member, I did research on ‘Movie Recommendation based on Knowledge Graph’. I cooperated with two Ph.D. three M.Sc. as a team member. Key results: (1) Excellent Team (2) Internship opportunity

[Jul. 2018 - Aug. 2018] TAL FutureCamp AI Lab, Research Team Member, I did research on ‘Recommendation System for Movie’ as a team member. Key results: (1) Internship opportunity

[Sep. 2017 – Dec. 2017] Ali Tianchi Competition, Competitor, our topic was predicting user’s current store location based on user consumption data(one million+) and I was one of the team member. Key results: (1) Preliminary: 52/2845, Final:19/2845

[Sep.2014 – Jul.2019] Master’s Study on Software Engineer

[Sep.2012 – Jul.2016] Master’s Study on Computer Science.

Publication

[1] Chi W, Feng X(\*euqal contribution), Chen Y, et al. Stress Prediction Based on Multi-Granularity Linguistic Knowledge. IEEE International Conference on Acoustics, Speech and Signal Processing International Conference on Pattern Recognition and Machine Learning, 2023(ICASSP’23, under review)

[2] Zhang J, Feng X, Chen Y, et al. Prosody Prediction with Discriminative Representation Method. International Conference on Pattern Recognition and Machine Learning, 2022(PRML’22)

[3] Wang Z, Feng X, Tang J, et al. Deep Knowledge Tracing with Side Information. International conference on artificial intelligence in education.Springer, Cham, 2019(AIED’19).

[4] Feng X, Xie R, Sheng J, et al. Population statistics algorithm based on MobileNet. Journal of Physics: Conference Series. IOP Publishing, 2019(ICSP’19)

[5] Rong Xie, Feng X A method of quick edge detection based on Zynq. International Conference on Cloud Computing and Internet of Things, 2018(CCIOT’18)

[6] Sheng J, Feng X Research on the Internet of Things Platform for Smart and Environmental Protection. International Conference on Cloud Computing and Intelligence Systems, 2018(CCIS’18)

patents: CN111078898A, CN110970013A, CN111145724A, CN111079428A, CN111178042A

[1] Ali Tianchi BigData Competition Sep. 2018, Good,19/2845 Beijing, China  
[2] National Scholarship Sep. 2016, Southwest Minzu University Chengdu, China  
[3] Outstanding Secretary of the Youth League Scholarship May 2014, Southwest Minzu University Chengdu, China  
[4] Annual Excellent Student Innovative Project Sep. 2013, Southwest Minzu University, 2nd Award Chengdu, China  
[5] Outstanding Student Scholarship Jun. 2013, Jun. 2014Southwest Minzu University Chengdu, China

Please provide a short paragraph justifying your skills mentioned in the previous question. For example, if you have taken related courses, please list the course names and grades. (4500 character limit) \*

I have learned related(AI/ML/NLP) courses or knowledge from open-source websites(Coursera, Blogs, Github, PaperWeekly) or Universities(Stanford, CMU, and Taiwan University, etc.) Moreover, I learned mathematics, statistic, and programming courses for my Bachelor's and Master's degree.

I have built a solid foundation for my future study since I have accumulated research experiences, solid engineering, and soft skills from my school, extracurricular activities, internship, and formal work. The following describes some of my research experiences.

Please describe at most two projects that you are most proud of. If you have GitHub pages or websites for your projects, please provide the links here too. (4500 character limit) \*

My personal website is [*https://xqfeng-josie.github.io/*](https://xqfeng-josie.github.io/), Please refer to my CV and some project information. I will describe two projects during my internship and formal work.

**Research in Knowledge Tracing(**TAL AI Lab)

As human beings, we are challenging to keep track of knowledge, and I wondered how we could build a model to tackle this issue. My research proposed a deep knowledge tracing (DKT) model to monitor student knowledge state or skill acquisition level based on historical question-answer series. Even though deep neural networks already grasp the sequential dependencies, the intrinsic relation of information can develop our understanding of knowledge states and advance knowledge tracing. We built a question graph based on semantic and feature-based knowledge, obtained the representation combined with graph embedding, and finally, as supervision information for DKT. This approach demonstrates the importance of the side relation information, and the proposed framework outperforms state-of-the-art baselines significantly. In the meantime, I innovatively extend my results to another research project regarding adaptive learning, which is critical for tutoring systems. In this research, I was involved in **data mining, knowledge graph, graph representation learning,** etc. Eventually, we submitted a conference to *AIED 2019* (top conference in education AI)(Pdf: https://arxiv.org/pdf/1909.00372.pdf).

**Research in Emotional NLP**(Mobvoi AI Lab):

Apart from knowledge information, I also studied **text mining** regarding semantics and emotions. In 2019, I joined Mobvoi AI Lab as a speech algorithm engineer(now senior). Since then, I have mainly been involved in research projects that focus on **text information extraction** of text-to-speech(TTS), including semantic NLP and emotional NLP.

The emotional NLP, on the other hand, focuses on the intrinsic aspect of language understanding, such as style, stress, and emotion. These tasks are subjective without precise definitions and benchmarks. In this regard, I investigated and established the model solutions using an incremental verification approach, covering **criterion establishment, cross-validation, linguistic knowledge, and contrastive learning,** etc.  For instance, in text stress prediction, I proposed a two-stage pipeline to construct the coarse-to-fine model with **auxiliary granularity supervision** to decrease deviation and ensure global diversity. As a result, I submitted a first-author paper to *ICASSP 2023*(under review, top conference in speech). Deriving inspiration from **data mining**, **supervision**(semi- or non-) and **linguistic learning**, I am interested in extending my experience **in unstructured, multi- or cross- lingual text information extraction and understanding, and their application.(**Demo: **https://xqfeng-josie.github.io/stress/)**

If you have encountered significant hardship in pursuing your education/research, please describe how you overcame or managed it (optional).

When I decided to apply Ph.D., my family and friends were shocked as they thought it crazy for reasons like age, COVID-19, finances, etc. However, I understand this decision began one year ago and is solemn, well-prepared, and promised. I never regard age or gender as barriers to pursuing my dream, as higher education should be for everyone with desire, motivation, and passion. Moreover, I seized the opportunity to work with different professors and Ph.D. students to better prepare myself for future research, during which I developed my research sensitivity, hands-on research skills and brought my academic results to top conferences.