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EDUCATION

Michigan State University - East Lansing, MI
GPA: 4.0

Ph.D Computer and Information Science
Expect Completed: 2027

University of Illinois Urbana-Champaign - Champaign, IL
GPA: 3.78

M.S. Statistics
Completed: May 2017

Beijing Jiaotong University - Beijing, China
GPA: 3.5 – Studies Excellent Scholarship twice (Top 25%)

B.S. Information and Computing Science
Completed: July 2015

AWARDS

- 2nd Place on OGB-LSC @ NeurIPS Node Classification Competition 2022¹
- 1st Place on Task 3, 2nd Place on Task 4 and 2nd Place on all-inclusive tasks at NeurIPS Education Challenge 2020²
- 2nd Place at EMNLP Clarifying Questions for Open-Domain Dialogue Systems (ClariQ) Challenge 2020³
- 1st Place at ACM UbiComp STABILO Time Series Classification Challenge 2020⁴

PUBLICATIONS

- [1] FAN, W., LIU, C., LIU, Y., LI, J., **Li, H.**, LIU, H., TANG, J., AND LI, Q. Generative diffusion models on graphs: Methods and applications. *arXiv preprint arXiv:2302.02591* (2023).
- [2] KANG, Y., LIU, T., **Li, H.**, HAO, Y., DING, W., AND LIU, Z. Self-supervised Audio-and-Language Pre-training with Extremely Low-Resource Parallel Data. In *The Thirty-Fifth AAAI Conference on Artificial Intelligence* (2022).
- [3] **Li, H.**, KANG, Y., LIU, T., DING, W., AND LIU, Z. CTAL: Pre-training Cross-modal Transformer for Audio-and-Language Representations. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)* (2021).
- [4] LIU, T., FANG, Q., DING, W., **Li, H.**, WU, Z., AND LIU, Z. Mathematical Word Problem Generation from Commonsense Knowledge Graph and Equations. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)* (2021).
- [5] **Li, H.**, DING, W., WU, Z., AND LIU, Z. Leaning Fine-Grained Multimodal Alignment For Speech Emotion Recognition. In *Conference of the International Speech Communication Association (INTERSPEECH)* (2021).
- [6] HAO, Y., **Li, H.**, DING, W., WU, Z., AND LIU, Z. Multi-Task Learning based Online Dialogic Instruction Detection with Pre-trained Language Models. In *International Conference on Artificial Intelligence in Education (AIED)* (2021), Springer.
- [7] **Li, H.**, KANG, Y., HAO, Y., DING, W., WU, Z., AND LIU, Z. A Multimodal Machine Learning Framework for Teacher Vocal Delivery Evaluation. In *International Conference on Artificial Intelligence in Education (AIED)* (2021), Springer.
- [8] CHEN, J., **Li, H.**, DING, W., WU, Z., AND LIU, Z. An Educational System for Personalized Teacher Recommendation in K-12 Online Classrooms. In *International Conference on Artificial Intelligence in Education (AIED)* (2021), Springer.
- [9] **Li, H.**, DING, W., YANG, S., AND LIU, Z. Identifying At-Risk K-12 Students in Multimodal Online Environments: A Machine Learning Approach. In *International Conference on Educational Data Mining (EDM)* (2020).
- [10] **Li, H.**, WANG, Z., TANG, J., DING, W., AND LIU, Z. Siamese Neural Networks for Class Activity Detection. In *International Conference on Artificial Intelligence in Education (AIED)* (2020), Springer, pp. 162–167.
- [11] **Li, H.**, KANG, Y., DING, W., YANG, S., YANG, S., HUANG, G. Y., AND LIU, Z. Multimodal Learning for Classroom Activity Detection. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* (2020), IEEE, pp. 9234–9238.
- [12] CHEN, J., **Li, H.**, WANG, W., DING, W., HUANG, G. Y., AND LIU, Z. A Multimodal Alerting System for Online Class Quality Assurance. In *International Conference on Artificial Intelligence in Education (AIED)* (2019), Springer, pp. 381–385.

¹Winners announced at: <https://ogb.stanford.edu/neurips2022/results/>

²Diagnostic Questions: Predicting Student Responses and Measuring Question Quality

³Winners announced at: <http://convai.io/>

⁴Winners announced at: <https://stabilodigital.com/submissions/>

WORK EXPERIENCE

Microsoft Search Technology Center Asia (STCA) - Applied Scientist II - Beijing, China Oct. 2021 - Aug. 2022

- Construct the document classification model to generate valid index for webpage recommendation service.
- Build the model based webpage form auto-filling plug-in for IE/Edge browser.
- Research on multi-lingual and multi-modal embedding system, which maps HTMLs into a shared vector space.

TAL Education Group - Machine Learning Scientist - Beijing, China Jun. 2018 - Oct. 2021

- Design a teaching quality assurance system for online 1 on 1 education platforms, which evaluates performance of class participants automatically and improves the work efficiency of platforms' managers by 80%.
- Construct a student drop-out prediction algorithm and catch the 80% at-risk students within the predicted top 30% ranked students.
- Research on multi-modal learning framework for problem like speaker diarization, speech fluency, speech emotions, etc., and achieve the SOTA results on several public datasets like *IEMOCAP*, *RAVDESS*, *MOSEI*, et al.

RESEARCH EXPERIENCE

Multimodal Learning on Audio-and-Language Tasks - Beijing, China Aug. 2020 - July. 2021

- Propose a **Multimodal Pre-training** framework, CTAL, to learn inter- and intra-connections between audio-and-language modalities in a self-supervised manner and achieve SOTA on multiply downstream tasks: Emotion Classification, Sentiment Analysis, and Speaker Verification. This work is submitted to *EMNLP2021*.
- Propose a **Cross Modality Excitation** model to fuse the acoustic and semantic representations efficiently and outperform the prior SOTA baseline models by a great margin in Emotion Classification task. This work was submitted to *INTER_SPEECH2021*.
- Design an **Iterative Denoising Procedure** to solve the constraints caused by limited parallel corpus in current multimodal pre-training process, which further improves the performance of multimodal pre-training models on downstream tasks. This work is submitted to *EMNLP2021*

Data Mining in Education Scenarios - Beijing, China Jan. 2020 - May 2020

- Study on the evaluation of teacher's vocal delivery and propose a pair-wise comparing algorithm to eliminate the subjectivity of manual evaluation. This work is submitted to *AIED2021*
- Construct a recommendation system to recommend new students with their matching teachers and design valid features combing with external boosted algorithm. This work is submitted to *AIED2021*
- Propose an at-risk student prediction system which incorporates both in-class and after-class features to identify the dropout behavior of at-risk students precisely. This work is submitted to *EDM2020*.

Speaker Diarization in Classroom Scenarios - Beijing, China May 2019 - Dec. 2019

- Propose two **Multimodal Learning** frameworks to separate the speech segments from teacher or student in the classroom scenario, both algorithms outperformance the other baseline models by a great margin.
- Propose a **Siamese Neural Network** structure fusing with **GRU**, **LSTM**, **Transformers** to enhance the acoustic representatives of each speech segment, constructed an attentional based classifier for the prediction. This work was accepted by *AIED2020*.
- Propose a **Multimodal Self-Attention** module to bridge the scattered semantic information from different speech segments with their corresponding acoustic features, designed the the prior constraint loss on the attentional matrix to accelerate the model's convergence. This work was accepted by *ICASSP2020*.

ACADEMIA SERVICES

- External Reviewer: CIKM2021, EAAI2021, ICTAI2021, AIED2021, BMVC2020, KDD2020
- Workshop Organizer: AI4EDU@IJCAI2021, AI4EDU@AAAI2021