Curriculum Vitae

Lingyu Zhang

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EDUCATION:

Rensselaer Polytechnic Institute, Troy, NY
Ph.D. in Electrical Engineering, Aug 2021, GPA: 3.93/4.00
Columbia University, New York, NY
Master of Science in Electrical Engineering, Dec 2017, GPA: 3.71/4.00
Huazhong University of Science and Technology, Wuhan, China
Bachelor of Engineering in Optoelectronic Information Engineering, June 2016, GPA: 3.83/4.00

RESEARCH TOPIC:

Personalized Language Models. Knowledge graph Question and Answering. Multimodal Machine learning, Computer vision, Vision-language models, Generative models, Multimodal Retrieval Augmented Generation, Video understanding.

WORK EXPERIENCE:

Samsung Research America, Mountain View, CA   Sep 2022 - Present
Senior Research Scientist, Multimodal AI & Knowledge and Dialogue
A1 Inventor Award, Jan 2024
● Graph retrieval augmented generation for question and answering.
● Personalized small language models.
● High-resolution vision transformer (ViT) for concise chart/graph question answering (ChartQA).
● Efficient multimodal language model for outside knowledge visual question answering (VQA).
● Empower small language models with smart home action and planning abilities.
● Customized stable diffusion for image generation using personalized context.
● Compositional zero-shot learning for visual object attribute recognition.

DiDi Research America, Mountain View, CA   Nov 2021 - Sep 2022
Software Engineer II in Autonomous Driving - Perception team
New Hire Award, Aug 2022
● Develop machine learning and computer vision algorithms for object detection and recognition in the autonomous driving system.
● Develop and deploy multimodal fusion models to combine 2D camera data and 3D point cloud for cyclist heading estimation.
● Do research on the state-of-the-art algorithms for autonomous driving perception problems.

INTERNSHIP EXPERIENCE:

American International Group (AIG), New York, NY   September 2017 – December 2017
3D reconstruction for car accident damage estimation from single 2D image
Position: Research Assistant

SKILLS:
- Python, C++, PyTorch, CUDA, multiprocessing, Linux environment
- Langchain, Deeplake, LlamaIndex

SELECTED PUBLICATIONS:
- S. Paul, **L. Zhang**, Y. Shen, and H. Jin. Enabling device control planning capabilities of small language models. 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**).
- J. S. Smith, Y. C. Hsu, **L. Zhang**, T. Hua, Z. Kira, Y. Shen, and H. Jin (2024). Continual diffusion: Continual customization of text-to-image diffusion with c-lora. Transactions on Machine Learning Research (**TMLR**).
- **L. Zhang**, T. Hua, Y. Shen, and H. Jin (2023). Prompt Tuning for Zero-shot Compositional Learning. arXiv preprint arXiv:2312.02191.
- **L. Zhang** and R.J. Radke, Natural Language Video Moment Localization Through Query-Controlled Temporal Convolution, 2022 IEEE Winter Conference on Applications of Computer Vision (**WACV**). IEEE, 2022
- **L. Zhang** and R.J. Radke, Temporal Attention and Consistency Measuring for Video Question Answering, ACM International Conference on Multimodal Interaction (**ICMI**), October 2020.
- **L. Zhang** and R.J. Radke, A Multi-Stream Recurrent Neural Network for Social Role Detection in Multiparty Interactions. **IEEE Journal** of Selected Topics in Signal Processing (2020).
- **L. Zhang**, I. Bhattacharya, M. Morgan, M. Foley, C. Riedl, B.F. Welles, and R.J. Radke, Multiparty Visual Co-Occurrences for Estimating Personality Traits in Group Meetings, 2020 IEEE Winter Conference on Applications of Computer Vision (**WACV**). IEEE, 2020.
- **L. Zhang**, M. Morgan, I. Bhattacharya, M. Foley, J. Braasch, C. Riedl, B.F. Welles, and R.J. Radke. Improved Visual Focus of Attention Estimation and Prosodic Features for Analyzing Group Interactions. ACM International Conference on Multimodal Interaction (**ICMI**), October 2019.
- M. Li, **L. Zhang**, R.J. Radke, and H. Ji, Keep Meeting Summaries on Topic: Abstractive Multi-Modal Meeting Summarization, Annual Meeting of the Association for Computational Linguistics (**ACL**), July 2019.

TEACHING EXPERIENCE

ECSE-2500 **Engineering Probability**   January 2019 – May 2019
Rensselaer Polytechnic Institute, Troy, NY   *Position: Teaching assistant*
ECSE-4750 **Computer Graphics**   September 2018 – December 2018
Rensselaer Polytechnic Institute, Troy, NY   *Position: Teaching assistant*
E6885 **Reinforcement Learning**   September 2017 – December 2017
Columbia University, New York, NY   *Position: Course assistant*

SERVICE
Journal Reviewer:
- Journal of Computer Vision and Image Understanding
- Frontiers in Big Data
- Information Processing Management
- Transactions on Knowledge and Data Engineering

Conference Reviewer: EMNLP, ACL, WACV