Yibo Liu

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Education

University of Victoria | BC, Canada *Sept 2023 - present*
Ph.D. Candidate in Computer Science, Supervisor: Prof. Dr. Teseo Schneider
Current research interest focuses on how LLMs and neural networks enhance the intelligence and expressivity of physical-based simulations.

Courant Institute of Mathematical Science, New York University | NY, USA *Sept 2019 - Dec 2022*
M.S. in Computer Science | GPA: 3.53 / 4
Courses: Mathematics of Deep Learning / High Performance Machine Learning / Machine Learning / GPUs: Architecture and Programming / Multicore Processors / Geometric Modeling / Compiler Construction / Programming Languages / Operating Systems / Fundamental Algorithms

Beijing University of Posts and Telecommunications (BUPT) | Beijing, China *Sept 2015 - June 2019*
B.Eng. in Electronic Information Science and Technology
Thesis: *Breast Cancer Detection with Mask R-CNN*

Publications

[CVPR 2024 Best Paper Nomination] "MMMU: A Massive Multi-discipline Multimodal Understanding and Reasoning Benchmark for Expert AGI", Xiang Yue, Yuansheng Ni, Kai Zhang, Tianyu Zheng, Ruoqi Liu, Ge Zhang, Samuel Stevens, Dongfu Jiang, Weiming Ren, Yuxuan Sun, Cong Wei, Botao Yu, Ruibin Yuan, Renliang Sun, Ming Yin, Boyuan Zheng, Zhenzhu Yang, **Yibo Liu**, Wenhao Huang, Huan Sun, Yu Su, Wenhu Chen. *Proceedings of CVPR* 2024.

[Preprint] "Endowing Language Models with Multimodal Knowledge Graph Representations", Ningyuan Huang, Yash R. Deshpande, **Yibo Liu**, Houda Alberts, Kyunghyun Cho, Clara Vania, Iacer Calixto. *arXiv* 2206.13163, Jun. 2022.

[EMNLP Workshop MRL 2021] "VisualSem: a high-quality knowledge graph for vision and language", Houda Alberts, Ningyuan Huang, Yash Deshpande, **Yibo Liu**, Kyunghyun Cho, Clara Vania, Iacer Calixto. In *Proceedings of the 1st Workshop on Multilingual Representation Learning*, pp. 138-152, Nov. 2021.
*I was the **speaker** of the workshop's online presentation.

[SIGKDD 2021] "Table2Charts: Recommending Charts by Learning Shared Table Representations", Mengyu Zhou, Qingtao Li, Xinyi He, Yuejiang Li , **Yibo Liu**, Wei Ji, Shi Han, Yining Chen, Daxin Jiang, Dongmei Zhang. In *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, pp. 2389-2399, Aug. 2021.

Industrial Internship

Microsoft Research Asia | Beijing, China *Aug 2020 - Feb 2021*
Intern at *Data, Knowledge and Intelligence* group

- Contributed to the research on *Table2Charts*, which uses reinforcement learning model to generate charts from tabular data. The work was published at SIGKDD 2021.
- Delivered *Table2Charts* technique to *Bing* search engine and to *Microsoft Excel* spreadsheet intelligence chart recommendation.
- Designed and implemented multilingual key-phrase extraction algorithm for questionnaire word cloud used in *Microsoft Forms* Ideas and in *Microsoft Teams* poll, meeting the online and offline requirements.

Research Experiences

New York University | NY, USA *2022 - 2023*
Project: GPU Accelerated Contact Simulations in PolyFEM Library
Supervisors: Prof. Dr. Teseo Schneider and Prof. Dr. Daniele Panozzo

- Accelerated sparse Newton descent solver by implementing GPU assembly value, gradient and hessian computation CUDA kernels for elastic form using CUDA and extra libraries CuBlas, CuSparse, Thrust. It outperformed multi-threading CPU version.
- Added algebraic multigrid method iterative solver to the library, accelerated linear solver by applying an Eigen sparse matrix wrapper using AMGCL CUDA backend.

Center for Data Science, New York University | NY, USA *Mar 2020 - May 2021*
Project: Learning Robust Mulilingual Multimodal Knowledge Graph Representations
Supervisors: Prof. Dr. Iacer Calixto and Dr. Clara Vania

- This work proposed a method to make natural language understanding models more parameter efficient by storing knowledge in an external knowledge graph (KG) and retrieving from this KG using a dense index.
- The work led to two publications, I presented the findings on Multilingual Representation Learning workshop as the speaker.

Center for Speech and Language Technologies, Tsinghua University | Beijing, China *2019*
Research Intern | Project: A Rhythm Model for Ancient Chinese Poetry Generation
Supervisor: Prof. Dr. Dong Wang

- Proposed a rhythm model to learn tonal patterns replacing the rule-based method for ancient Chinese poetry generation based on bi-GRU with memory mechanism.
- Technical report: *A Rhythm Model for Chinese Poetry Generation*. [Code]

Peer Reviewing Services

AAAI Conference on Artificial Intelligence (AAAI) *2025*

International Conference on Learning Representations (ICLR) *2025*

Transactions on Visualization and Computer Graphics (TVCG) *2024*

Volunteers

SIGGRAPH Asia 2024 Student Volunteer | Tokyo, Japan *Dec 2024*

Teaching Assistantship

CSC 305 Intoduction to Computer Graphics, University of Victoria, BC, Canada *2025 summer*

CSC 503 & SENG 474 Data Mining, University of Victoria, BC, Canada *2025 spring*

CSC 503 & SENG 474 Data Mining, University of Victoria, BC, Canada *2024 winter*

CSC 116 Introduction to C++, University of Victoria, BC, Canada *2024 fall*

SENG 350 Software Architecture, University of Victoria, BC, Canada *2024 fall*

CSC 503 & SENG 474 Data Mining, University of Victoria, BC, Canada *2023 fall*

Technical Skills

Programming languages: Python, C/C++, C#, Java, Bash, HTML/CSS
Libraries: PyTorch, Tensorflow, CUDA
Softwares: Blender, Unity, Paraview
Hardware languages and Platforms: VHDL, Verilog, Multisim, Quartus, Keil