Zhaocheng Zhu

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EDUCATION

Mila - Québec AI Institute / Université de Montréal, Canada *Sep. 2019 - Present*
Ph.D. in Computer Science (expected graduation: Aug. 2024)
· Reasoning, Knowledge Graphs, Machine Learning Systems
Advisor: Jian Tang

Mila - Québec AI Institute / Université de Montréal, Canada *Sep. 2018 - Aug. 2019*
M.Sc. in Computer Science, transferred to Ph.D.
· Graph Representation learning, Machine Learning Systems
Advisor: Jian Tang

Peking University, China *Sep. 2014 - July 2018*
B.S. in Computer Science (with honors)
· Natural Language Processing, Unsupervised Representation Learning, Word Semantics
Advisor: Junfeng Hu
· Computer Vision, Object Detection
Thesis Advisor: Yizhou Wang, Jifeng Dai (Microsoft Research Asia)

INTERNSHIP

Google, Sunnyvale, United States *Sep. 2023 - now*
Mentor: Hanjun Dai, Yuan Xue

Google, Remote from Canada *Apr. 2023 - June 2023*
· Reasoning and hallucination in large language models
· Discovery of explicit knowledge with large language models
Mentor: Hanjun Dai, Yuan Xue

Microsoft Research Asia, Beijing, China *Sep. 2017 - May 2018*
· Video object detection with optical flow and temporal context
· Reproduction of Mask R-CNN for keypoint detection
· Towards accurate localization in object detection
Mentor: Jifeng Dai

Carnegie Mellon University, Pittsburgh, United States *July 2017 - Sep. 2017*
· Stacked local linear explanations for deep neural networks
Advisor: Pradeep Ravikumar

Mitsubishi Information Technology R&D Center, Kamakura, Japan *July 2016 - Aug. 2016*
· Dialog State Tracking Challenge 5
· Chinese language understanding for navigation systems
Mentor: Yusuke Koji

TUTORIALS

Reasoning on Knowledge Graphs: Symbolic or Neural?
Meng Qu, **Zhaocheng Zhu**, Jian Tang. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2022.

PUBLICATIONS

A*Net: A Scalable Path-based Reasoning Approach for Knowledge Graphs
Zhaocheng Zhu[*], Xinyu Yuan[*], Mikhail Galkin, Sophie Xhonneux, Ming Zhang, Maxime Gazeau, Jian Tang. In *Conference on Neural Information Processing Systems*, 2023.

Large Language Models can Learn Rules
Zhaocheng Zhu, Yuan Xue, Xinyun Chen, Denny Zhou, Jian Tang, Dale Schuurmans, Hanjun Dai. *arXiv preprint arXiv:2310.07064*, 2023.

GraphText: Graph Reasoning in Text Space
Jianan Zhao, Le Zhuo, Yikang Shen, Meng Qu, Kai Liu, Michael Bronstein, **Zhaocheng Zhu**, Jian Tang. *arXiv preprint arXiv:2310.01089*, 2023.

Towards Foundation Models for Knowledge Graph Reasoning
Mikhail Galkin, Xinyu Yuan, Hesham Mostafa, Jian Tang, **Zhaocheng Zhu**. *arXiv preprint arXiv:2310.04562*, 2023.

Neural Graph Reasoning: Complex Logical Query Answering Meets Graph Databases
Hongyu Ren[*], Mikhail Galkin[*], Michael Cochez, **Zhaocheng Zhu**, Jure Leskovec. *arXiv preprint arXiv:2303.14617*, 2023.

Inductive Logical Query Answering in Knowledge Graphs
Mikhail Galkin, **Zhaocheng Zhu**, Hongyu Ren, Jian Tang. In *Conference on Neural Information Processing Systems*, 2022.

PEER: A Comprehensive and Multi-Task Benchmark for Protein Sequence Understanding
Minghao Xu, Zuobai Zhang, Jiarui Lu, **Zhaocheng Zhu**, Yangtian Zhang, Chang Ma, Runcheng Liu, Jian Tang. In *Conference on Neural Information Processing Systems (Datasets and Benchmarks Track)*, 2022.

Neural-Symbolic Models for Logical Queries on Knowledge Graphs
Zhaocheng Zhu, Mikhail Galkin, Zuobai Zhang, Jian Tang. In *International Conference on Machine Learning*, 2022.

TorchDrug: A Powerful and Flexible Machine Learning Platform for Drug Discovery
Zhaocheng Zhu, Chence Shi, Zuobai Zhang, Shengchao Liu, Minghao Xu, Xinyu Yuan, Yangtian Zhang, Junkun Chen, Huiyu Cai, Jiarui Lu, Chang Ma, Runcheng Liu, Louis-Pascal Xhonneux, Meng Qu, Jian Tang. *arXiv preprint arXiv:2202.08320*, 2022.

Neural Bellman-Ford Networks: A General Graph Neural Network Framework for Link Prediction
Zhaocheng Zhu, Zuobai Zhang, Louis-Pascal Xhonneux, Jian Tang. In *Conference on Neural Information Processing Systems*, 2021. Rank 12/39 in the link prediction task of OGB-LSC.

KEPLER: A Unified Model for Knowledge Embedding and Pre-trained Language Representation
Xiaozhi Wang, Tianyu Gao, **Zhaocheng Zhu**, Zhengyan Zhang, Zhiyuan Liu, Juanzi Li, Jian Tang. In *Transactions of the Association for Computational Linguistics*, 2021.

GraphAF: A Flow-based Autoregressive Model for Molecular Graph Generation
Chence Shi[*], Minkai Xu[*], **Zhaocheng Zhu**, Weinan Zhang, Ming Zhang, Jian Tang. In *International Conference on Learning Representations*, 2020

Self-Adaptive Network Pruning
Jinting Chen, **Zhaocheng Zhu**, Cheng Li, Yuming Zhao. In *International Conference on Neural Information Processing*, 2019. (Best Student Paper Finalist)

GraphVite: A High-Performance CPU-GPU Hybrid System for Node Embedding
Zhaocheng Zhu, Shizhen Xu, Meng Qu and Jian Tang. In *The World Wide Web Conference*, 2019.

Saliency Supervision: An Intuitive and Effective Approach for Pain Intensity Regression
Conghui Li, **Zhaocheng Zhu** and Yuming Zhao. In *International Conference on Neural Information Processing*, 2018.

Context Aware Document Embedding
Zhaocheng Zhu and Junfeng Hu. *arXiv preprint arXiv:1707.01521*, 2017.

Dialog State Tracking with Attention-based Sequence-to-Sequence Learning
Takaaki Hori, Hai Wang, Chiori Hori, Shinji Watanabe, Bret Harsham, Jonathan Le Roux, John R Hershey, Yusuke Koji, Yi Jing, **Zhaocheng Zhu** and Takeyuki Aikawa. In *IEEE Spoken Language Technology Workshop (SLT)*, 2016. (Runner up at Dialog State Tracking Challenge 5)

SELECTED PROJECTS

TorchDrug: A Powerful and Flexible Machine Learning Platform for Drug Discovery (leader of TorchDrug team)
Machine learning development platform for drug discovery in PyTorch. Support 6 tasks, more than 25 models. Over 1,300 stars and 40,000 downloads.
Featured in *PyTorch ecosystem*. Supported by NVIDIA Applied Research Accelerator Program.
`https://torchdrug.ai` `https://github.com/DeepGraphLearning/torchdrug`

GraphVite: A General and High-Performance Graph Embedding System for Various Applications (leader of GraphVite team)
General and high-performance graph embedding system. Support 3 applications, 10 models and more than 40 baseline benchmarks. Over 1,200 stars and 5,000 downloads.
`https://graphvite.io` `https://github.com/DeepGraphLearning/graphvite`

Literature of Deep Learning for Graphs (with Meng Qu and Weiping Song)
Comprehensive paper list of deep learning for graphs. Over 3,000 stars.
`https://github.com/DeepGraphLearning/LiteratureDL4Graph`

HONORS AND AWARDS

Tuition Fee Exemption Scholarships, Université de Montréal	*2019 - 2021*
Outstanding Graduate Student, Peking University	*2018*
Top Talent Class of EECS, Peking University	*2016 - 2018*
Outstanding Research Award, Peking University	*2016*
Kwang-Hua Scholarship, Peking University	*2016*
Honorable Mention, Mathematical Contest in Modeling (MCM)	*2016*
Merit Student, Peking University	*2015*
Tung OCCL Scholarship, Peking University	*2015*
Honorable Mention, Mathematical Contest in Modeling (MCM)	*2015*
Group Champion, Peking University Debate Competition for Freshman	*2014*
Second Prize (ranked 86th in China), National Olympiad in Informatics (NOI)	*2013*

SERVICE

Academic Reviewer

- WWW, ICML, KDD, NeurIPS, LoG *2023*
- TKDE, ICML, NeurIPS *2022*
- GNNSys Workshop (MLSys) *2021*
- DLG Workshop (KDD) *2020*
- GRL Workshop (NeurIPS) *2019*

Mentoring & Teaching

- Mentor, Buddy Program for New Students, Mila — *2019 - 2021*
- Reviewer, PhD / MSc Recruitment, Mila — *2020 - 2021*
- Teaching Assistant, Machine Learning II, HEC Montréal — *Winter 2020*

Social & Leadership

- Lab representatives[1] (11 out of 1,000+ students), Mila — *Nov. 2022 - Nov. 2023*
- League branch secretary, Society of Photography, Peking University — *Sep. 2017 - June 2018*
- Leader of story portrait group, Society of Photography, Peking University — *Apr. 2015 - Aug. 2017*
- Member of organizers & news team, HackPKU, Peking University — *Apr. 2016*

SKILLS

Programming Languages:

- Proficient: C/C++, Python, CUDA, Pascal/Object Pascal
- Capable: MATLAB, SQL, Bash, Assembly, HTML/CSS

Software Development: OOP design, refactorization (> 20k lines), parallel programming
Deep Learning: PyTorch, MXNet, Keras, TensorFlow
Toolchains: Git, LaTeX, GDB, CMake, Conda(build), Pip(build), Photoshop
Languages: Mandarin Chinese(native), English(proficient), French(beginner)

Open-Source Contributions: PyTorch-Geometric, Gensim, PyKEEN, OpenFold, Graphium

[1] A committee that serves students and represents students in meetings with professors and staffs.