# 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: 2023)
· Graph Representation learning, Knowledge Graphs, Drug Discovery, 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

**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

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

**Learning to Efficiently Propagate for Reasoning on Knowledge Graphs**
**Zhaocheng Zhu**[*], Xinyu Yuan[*], Louis-Pascal Xhonneux, Ming Zhang, Maxime Gazeau, Jian Tang. *arXiv preprint arXiv:2206.04798*, 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. Accepted by *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 5 tasks, more than 20 models. Over 1,000 stars and 16,000 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 1,000 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 2,900 stars.
`https://github.com/DeepGraphLearning/LiteratureDL4Graph`

## HONORS AND AWARDS

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|---|---|
| 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* |

## SERVICE

**Academic Reviewer**

- WWW *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 Activity**

- 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, Pascal/Object Pascal
- Capable: MATLAB, SQL, Bash, Assembly, HTML/CSS

**Frameworks:** CUDA, PyTorch, MXNet, Keras, TensorFlow
**Toolchains:** Git, LaTeX, GDB, CMake, Conda(build), Pip(build), Photoshop
**Languages:** Mandarin Chinese(native), English(proficient), French(beginner)

**Open-Source Contribution:** PyTorch-Geometric, Gensim, PyKEEN, OpenFold

Good at designing and organizing large code bases ($>$ 20k lines), and accelerating deep learning models.