

# Zhaocheng Zhu

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## EDUCATION

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**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
  - Computer Vision, Object Detection
- Advisor: Junfeng Hu  
Thesis Advisor: Yizhou Wang, Jifeng Dai (Microsoft Research Asia)

## INTERNSHIP

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**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

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**Reasoning on Knowledge Graphs: Symbolic or Neural?**

Meng Qu, **Zhaocheng Zhu**, Jian Tang. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2022.

## PUBLICATIONS

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**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.

**A\*Net: A Scalable Path-based Reasoning Approach for Knowledge Graphs**

Zhaocheng Zhu<sup>\*</sup>, Xinyu Yuan<sup>\*</sup>, Mikhail Galkin, Sophie Xhonneux, Ming Zhang, Maxime Gazeau, Jian Tang. *arXiv preprint arXiv:2206.04798*, 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<sup>\*</sup>, Minkai Xu<sup>\*</sup>, 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 1,100 stars and 20,000 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 1,100 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

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### Academic Reviewer

- WWW, ICML 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

- Lab representatives, Mila Nov. 2022 - Present
- 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

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### 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.