Qimai Li

Personal Info

Position:	Research Scientist	Home Page:	https://liqimai.github.io
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Organization:	Parametrix.AI		

Education

2017/09 - 2022/09	**The Hong Kong Polytechnic University** Ph.D. in the Department of Computing
2013/09 - 2017/06	**Zhejiang University** B.E. in Computer Science GPA 3.81/4.0

Experiences

2022 - Now	**Parametrix.AI** *Research Scientist* Reinforcement Learning, Generative Model, Distributed ML Training, General-Purpose Tensor Programming.
2020 - 2021	**Alibaba DAMO Academy** *Intern* Worked on Taobao product search system. Designed personalized product search algorithm with graph convolution.

Awards

2023	HuggingFace Daily Paper.
2021	One of the Most Influential AAAI Papers selected by Paper Digest, 10 out of 933 accepted papers in 2018, top 1.1%.
2019	Hong Kong Ph.D. Fellowship (250 out of 14,000+, 1.7% acceptance rate).
2017 - 2019	Postgraduate Scholarship in the Hong Kong Polytechnic University.
2016	Excellent Group in Student Research Training Program, Zhejiang University.
2015 & 2016	Scholarship for Outstanding Merits/Students, Zhejiang University.

Skills

Advanced:	Python, C/C++, Tensorflow, PyTorch, LaTeX, Git.
Intermediate:	Rust, Matlab, CUDA, Verilog.

Selected Publications

- **20+ papers in top AI conferences, 3000+ citations, h-index 10.**
- See Qimai LI - Google Scholar for full publication list.

[1] Kai Yang, Jian Tao, Jiafei Lyu, Chunjiang Ge, Jiaxin Chen, **Qimai Li**, Weihan Shen, Xiaolong Zhu, Xiu Li. "Using Human Feedback to Fine-tune Diffusion Models without Any Reward Model." In *submission to ICLR 2024*. Selected as **HuggingFace Daily Paper**.

[2] Xiaotong Zhang, Han Liu, **Qimai Li**, Xiao-Ming Wu, Xianchao Zhang. "Adaptive Graph Convolution Methods for Attributed Graph Clustering." In IEEE Transactions on Knowledge and Data Engineering **(TKDE)**, vol. 35, no. 12, pp. 12384-12399, 1 Dec. 2023, doi: 10.1109/TKDE.2023.3278721.

[3] **Qimai Li**, Xiaotong Zhang, Han Liu, Quanyu Dai, and Xiao-Ming Wu. "Dimensionwise Separable 2-D Graph Convolution for Unsupervised and Semi-Supervised Learning on Graphs." In *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining* **(KDD)**, 2021.

[4] **Qimai Li**, Xiaotong Zhang, Han Liu, Quanyu Dai, and Xiao-Ming Wu. "Dimensionwise Separable 2-D Graph Convolution for Unsupervised and Semi-Supervised Learning on Graphs." In *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining* **(KDD)**, 2021.

[5] Jiaxin Chen, Xiao-Ming Wu, Yanke Li, **Qimai Li**, Li-Ming Zhan, Fu-lai Chung. "A Closer Look at the Training Strategy for Modern Meta-Learning." In *Proceedings of the Thirty-fourth Conference on Neural Information Processing Systems* **(NeurIPS)**, 2020.

[6] **Qimai Li**, Xiao-Ming Wu, Han Liu, Xiaotong Zhang, and Zhichao Guan. "Label efficient semi-supervised learning via graph filtering." In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* **(CVPR)**, pp. 9582-9591, 2019.

[7] Xiaotong Zhang, Han Liu, **Qimai Li (co-first author)** and Xiao-Ming Wu. "Attributed Graph Clustering via Adaptive Graph Convolution." In *Proceedings of the 28th International Joint Conference on Artificial Intelligence* **(IJCAI)**, 2019.

[8] **Qimai Li**, Zhichao Han, and Xiao-Ming Wu. "Deeper insights into graph convolutional networks for semi-supervised learning." In *Thirty-Second AAAI Conference on Artificial Intelligence* **(AAAI)**, 2018. **Oral Presentation**. Selected as one of the **Most Influential AAAI Papers** by Paper Digest (**2478 Citations** as of December, 2023).

Projects

2023/03 - 2023/11	**Conditional 3D Motion Generation via Transformer**
	3D motion generation refers to generating a sequence of 3D character poses (Motion) that meet specific criteria within given conditions. We proposed a highly flexible and real-time generation method, that can generate motions for any humanoid, trained on data more than 10 million frames. Benefit from the flexibility of transformer masks, our method could support multiple generation tasks, including text to motion, trace to motion, trajectory to motion, motion in between.
2022/09 - 2023/02	**General-Purpose Tensor Programming — Jax-Accelerated RL Environment**
	Three decades ago, the HPC community discovered the potential of GPUs for general-purpose computing, pioneering the field of GPGPU and eventually developing current CUDA ecosystem. Today, tensor programming platforms are already Turing complete, showing us the hope for its use in general computing and the potential to accelerate more programs.
	As a trial of general-purpose tensor programming, we reimplemented all game logic of Lux AI Challenge Season 2 by tensor operations in JAX, and achieved 1000x higher throughput than CPUs on a single NVIDIA A100 GPU. This enables us to train AI for Lux environment in a single machine, which otherwise requires a cluster. See our git repo https://github.com/RoboEden/jux for detailed benchmarks.
2022/03 - 2022/09	**Multi-Agent Path Finding via Reinforcement Learning**
	Multi-agent path finding (MAPF), i.e., finding fastest collision-free paths for multiple agents on a graph, has been a long-standing combinatorial problem with NP-hard complexity. MAPF was mainly treated with Operations Research (OR) methods, but gains more attention from Reinforcement Learning (RL) fields now. We proposes a new RL solution to Flatland3, a MAPF challenge, which scores 125.3, several times higher than the best RL solution before. We creatively apply a novel network architecture, TreeLSTM, to MAPF in our solution. Together with several other RL techniques, including reward shaping, multiple-phase training, and centralized control, our solution is comparable to the top 2-3 OR methods.
2017/09 - 2022/03	**Machine learning via graph convolutional network**
	We revisited graph convolutional network (GCN) from the perspective of graph signal processing. In spatial domain, we showed that the graph convolution of GCN is actually a special form of Laplacian smoothing and pointed out its fundamental limits. In spectral domain, we showed that the key to GCN's success is the low-pass filters and unified GCN with the classic label propagation method. Revisiting them led to new insights that improve their modeling capabilities and reduce model complexity. Along with the insight, we extended current 1D graph-convolution-based methods to 2D graph-convolution-based ones, and analyzed intra-class variance and inter-class variance of both our mthods and existing methods to demonstrate the effectiveness of 2D graph convolution. Results were published in AAAI-18, CVPR-19 and KDD-21.
2015/09- 2016/01	**Serenity: Toy Computer System**
	Serenity is a tiny but complete computer system. All software and most hardware were designed by our own team. It consists of 5 parts – a single-core, 5-stage-pipelined CPU with MIPS ISA, 64KB memory, I/O system, a single-job operating system, several user applications. We also developed a virtual machine of our computer system running on Windows.
2015/06 - 2015/07	**Whatever: Search Engine**
	Whatever is a general web search engine, which supports wildcards, spell check, synonym search and phrase search. It implements various information retrieval algorithms, including bool model, vector space model, tf-idf features, PageRank.
2015/04 - 2016/04	**Heart: Android Heart Rate Monitor**
	Heart is an android application for heart-rate measurement. With our application, you can measure heart rate anywhere and anytime without extra devices other than your smart phone. This project was entitled as excellent SRTP project by College of Biomedical Engineering & Instrument Science, Zhejiang University.