Li Ding

CONTACT

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RESEARCH INTERESTS

Evolutionary Machine Learning, Deep Learning, Computer Vision, Genetic Programming, Quantum Computing, Human-Centered AI, Autonomous Driving

EDUCATION

University of Massachusetts Amherst, Amherst, MA
Ph.D. in Computer Science 2020.9 - present
(AI Track, Advisor: Prof. Lee Spector)

Massachusetts Institute of Technology, Cambridge, MA
Graduate Study in EECS (non-degree) 2019.9 - 2020.1

University of Rochester, Rochester, NY
M.S. in Data Science 2016.6 - 2017.5

Central University of Finance and Economics, Beijing, China
B.S. in Statistics 2012.9 - 2016.6

WORK EXPERIENCE

University of Massachusetts Amherst, Amherst, MA
Research Assistant 2020.9 - present
- Advisor: Prof. Lee Spector
- Worked on evolutionary machine learning, explored the application of evolutionary methods in deep learning, optimization, and quantum computing.

Meta Reality Labs, Burlingame, CA
Research Scientist Intern 2022.5 - 2022.8
- XR Tech team, mentor: Dr. Wenliang Zhao & Dr. Hang Zhang
- Worked on high-capacity image segmentation for AR/VR applications.

Massachusetts Institute of Technology, Cambridge, MA
Research Affiliate 2020.7 - 2021.6
Research Engineer 2017.9 - 2020.6
- Advisor: Dr. Lex Fridman & Dr. Bryan Reimer
- Worked on autonomous vehicles and human-centered AI, developed deep learning algorithms for real-time driving scene perception and driver monitoring systems.

University of Rochester, Rochester, NY
Research Assistant 2017.5 - 2017.8
- Advisor: Prof. Chenliang Xu
- Worked on weakly-supervised human action recognition in untrimmed videos.

PUBLICATIONS

CONFERENCE

[1] **L. Ding** and L. Spector, "Optimizing neural networks with gradient lexicase selection," in *International Conference on Learning Representations (ICLR)*, 2022

[2] **L. Ding**, R. Boldi, T. Helmuth, and L. Spector, "Going faster and hence further with lexicase selection," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) Companion*, pp. 538–541, 2022

[3] **L. Ding**, R. Sherony, B. Mehler, and B. Reimer, "Perceptual Evaluation of Driving Scene Segmentation," in *IEEE Intelligent Vehicles Symposium (IV)*, 2021

[4] **L. Ding**, M. Glazer, M. Wang, B. Mehler, B. Reimer, and L. Fridman, "MIT-AVT Clustered Driving Scene Dataset: Evaluating Perception Systems in Real-World Naturalistic Driving Scenarios," in *IEEE Intelligent Vehicles Symposium (IV)*, 2020

[5] **L. Ding** and C. Xu, "Weakly-Supervised Action Segmentation with Iterative Soft Boundary Assignment," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018

Journal

[1] **L. Ding** and L. Spector, "Multi-objective evolutionary architecture search for parameterized quantum circuits," *Entropy*, vol. 25, no. 1, p. 93, 2023

[2] **L. Ding**, J. Terwilliger, R. Sherony, B. Reimer, and L. Fridman, "Value of Temporal Dynamics Information in Driving Scene Segmentation," *IEEE Transactions on Intelligent Vehicles*, 2021

[3] L. Fridman, D. E. Brown, M. Glazer, W. Angell, S. Dodd, B. Jenik, J. Terwilliger, A. Patsekin, J. Kindelsberger, **L. Ding**, and S. Seaman, *et al.*, "MIT Advanced Vehicle Technology Study: Large-Scale Naturalistic Driving Study of Driver Behavior and Interaction with Automation," *IEEE Access*, 2019

Workshop

[1] **L. Ding** and L. Spector, "Evolutionary quantum architecture search for parametrized quantum circuits," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) Companion*, pp. 2190–2195, 2022

[2] **L. Ding**, R. Boldi, T. Helmuth, and L. Spector, "Lexicase selection at scale," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) Companion*, pp. 2054–2062, 2022

[3] **L. Ding** and L. Spector, "Evolving Neural Selection with Adaptive Regularization," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) Companion*, 2021

[4] L. Fridman, **L. Ding**, B. Jenik, and B. Reimer, "Arguing Machines: Human Supervision of Black Box AI Systems That Make Life-Critical Decisions," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2019

[5] L. Fridman, H. Schmidt, J. Terwilliger, and **L. Ding**, "Human Interaction with Deep Reinforcement Learning Agents in Virtual Reality," in *Advances in Neural Information Processing Systems (NeurIPS): Deep Reinforcement Learning Workshop*, 2018

Technical Reports

[1] **L. Ding**, J. Terwilliger, R. Sherony, B. Reimer, and L. Fridman, "MIT DriveSeg Dataset for Dynamic Driving Scene Segmentation," *IEEE Dataport*, 2020

[2] **L. Ding** and L. Fridman, "Object as Distribution," *arXiv preprint arXiv:1907.12929*, 2019

[3] **L. Ding** and C. Xu, "Tricornet: A Hybrid Temporal Convolutional and Recurrent Network for Video Action Segmentation," *arXiv preprint arXiv:1705.07818*, 2017

Teaching Experience

University of Massachusetts Amherst

- TA, COMPSCI 230: Computer Systems Principles — 2021

Massachusetts Institute of Technology

- TA, 6.S094: Deep Learning for Self-Driving Cars — 2018 & 2019
- TA, 6.S093: Human-Centered Artificial Intelligence — 2019
- TA, 6.S099: Artificial General Intelligence — 2018

Presentations

Presenter, *GECCO 2022: Quantum Optimization Workshop* — 2022.7
Presenter, *GECCO 2022: Workshop on Large-scale Evolutionary Optimization* — 2022.7
Invited speaker, *UMass Amherst CICS (Autonomous Learning Lab)* — 2022.3
Presenter, *GECCO 2021: Neuroevolution at Work Workshop* — 2021.7
Presenter, *IEEE IV 2021* — 2021.7
Invited speaker, *UMass Amherst ECE (Software System Research Lab)* — 2021.6
Invited speaker, *Ford Research & Advanced Engineering* — 2020.11
Presenter, *IEEE IV 2020: Workshop on Naturalistic Driving Data Analytics* — 2020.10
Invited speaker, *AutoSens 2020* — 2020.9
Invited speaker, *Affectiva* — 2020.3
Invited speaker, *Toyota Motor North America* — 2020.3
Invited speaker, *MIT Advanced Vehicle Technology (AVT) Consortium* — 2020.2
Invited speaker, *MIT CSAIL (Data Systems Group)* — 2019.10

Honors and Awards

Scholarships

- Graduate Tuition Scholarship, *University of Rochester* — 2016
- Excellent Youth of the Year (top 2%), *Central Univ. of Finance and Economics* — 2015

Awards

- 4th Place (among 150 teams, top 3%), *MIT 6.869 Miniplaces Challenge* — 2019
- Bronze Medal (107th of 1972, top 6%), *Kaggle Data Science Bowl* — 2017
- Meritorious Winner (top 5%), *COMAP's Mathematical Contest In Modeling* — 2015

Services

Program Committee

- GECCO 2022: Quantum Optimization Workshop

Reviewer

- IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) — 2023
- IEEE International Joint Conference on Neural Networks (IJCNN) — 2022
- IEEE Intelligent Vehicles Symposium (IV) — 2021
- British Machine Vision Conference (BMVC) — 2020 - 2021
- ACM Conference on Automotive User Interfaces (AutoUI) — 2020
- IEEE Transactions on Circuits and Systems for Video Technology — 2018 - 2020

Misc.

Side Projects

- Prepared interview materials for *AI Podcast* with Dr. Lex Fridman (ranked #1 on Apple Podcasts in the technology category, 1M views on Youtube)
- Created tutorials and competitions for *MIT Deep Learning* courses (8k stars on Github)
- Taught a summer/winter workshop at MIT with Dr. Tom Bertalan to high school students on building and programming autonomous robocars

Programming and Software

Python, C/C++, JavaScript, PyTorch, Tensorflow, Cirq, Qiskit.