Li Ding

CONTACT

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RESEARCH INTERESTS

Machine Learning and Optimization, Evolutionary Computation, Deep Learning, Computer Vision, Quantum Computing, Human-Centered Computing

EDUCATION

University of Massachusetts Amherst, Amherst, MA
Ph.D. in Computer Science 2020.9 - present
- Advisor: Lee Spector
- Principal Area: Artificial Intelligence

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
- Advisor: Chenliang Xu

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

RESEARCH EXPERIENCE

Google Research, Remote
Research Intern 2023.6 - present
- Project: Stochastic optimization for large models.
- Host: Masrour Zoghi & Maryam Karimzadehgan

Meta Reality Labs, Burlingame, CA
Research Scientist Intern 2022.5 - 2022.8
- Project: Image segmentation for AR/VR applications.
- Host: Wenliang Zhao & Hang Zhang

University of Massachusetts Amherst, Amherst, MA
Graduate Research Assistant 2020.9 - present
- Project: Evolutionary methods for deep learning, optimization, and quantum computing.
- Advisor: Lee Spector

Massachusetts Institute of Technology, Cambridge, MA
Research Affiliate 2020.7 - 2021.6
Research Engineer 2017.9 - 2020.6
- Project: Driving scene perception and driver monitoring systems.
- Advisors: Lex Fridman & Bryan Reimer

University of Rochester, Rochester, NY
Research Assistant 2017.5 - 2017.8
- Project: Weakly-supervised human action recognition.
- Advisor: Chenliang Xu

Publications

Conference

[1] **L. Ding**, E. Pantridge, and L. Spector, "Probabilistic Lexicase Selection," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO)*, 2023

[2] **L. Ding** and L. Spector, "Optimizing Neural Networks with Gradient Lexicase Selection," in *International Conference on Learning Representations (ICLR)*, 2022

[3] **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*, 2022

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

[5] **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

[6] **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*, 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**, *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*, 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*, 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 (Manual) Dataset for Dynamic Driving Scene Segmentation," *Massachusetts Institute of Technology AgeLab Technical Report 2020-1*, 2020

[2] **L. Ding**, M. Glazer, J. Terwilliger, B. Reimer, and L. Fridman, "MIT DriveSeg (Semi-auto) Dataset: Large-scale Semi-automated Annotation of Semantic Driving Scenes," *Massachusetts Institute of Technology AgeLab Technical Report 2020-2*, 2020

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

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

Presentations

Oral presentation, *GECCO 2022: Quantum Optimization Workshop*	2022.7
Oral presentation, *GECCO 2022: Workshop on Large-scale Evo. Opt.*	2022.7
Invited talk, *UMass Amherst CICS (Autonomous Learning Lab)*	2022.3
Oral presentation, *GECCO 2021: Neuroevolution at Work Workshop*	2021.7
Oral presentation, *IEEE IV 2021*	2021.7
Invited talk, *UMass Amherst ECE (Software System Research Lab)*	2021.6
Invited talk, *Ford Research & Advanced Engineering*	2020.11
Oral presentation, *IEEE IV 2020: Workshop on Naturalistic Driving DA*	2020.10
Invited talk, *AutoSens 2020*	2020.9
Invited talk, *Affectiva*	2020.3
Invited talk, *Toyota Motor North America*	2020.3
Invited talk, *MIT Advanced Vehicle Technology (AVT) Consortium*	2020.2
Invited talk, *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

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

Services

Program Committee

- GECCO: Quantum Optimization Workshop 2022-2023

Conference Reviewer

- International Conference on Computer Vision (ICCV) 2023
- Conference on Computer Vision and Pattern Recognition (CVPR) 2023
- International Joint Conference on Neural Networks (IJCNN) 2022
- Intelligent Vehicles Symposium (IV) 2021 - 2023
- British Machine Vision Conference (BMVC) 2020 - 2021
- Conference on Automotive User Interfaces (AutoUI) 2020

Journal Reviewer

- Pattern Recognition 2023
- IEEE Transactions on Circuits and Systems for Video Technology 2018 - 2020

Misc.

Side Projects

- Prepared interview materials for *AI Podcast* with 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 Tom Bertalan to high school students on building and programming autonomous robocars

Programming and Software

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