Li Ding

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RESEARCH INTERESTS

My research focus is **optimization algorithms** and **metaheuristics** as they apply to:

- **Machine Learning -** deep learning, reinforcement learning, meta-learning, and applications in quantum computing and human-computer interaction.
- **Alignment -** learning from human feedback and aligning models with human intuition.
- **Open-endedness -** generative models and adaptive agents in open-ended environments.

EDUCATION

University of Massachusetts Amherst	Amherst, MA
Ph.D. in Computer Science	2020.9 - (expected) 2024.9

- Advisor: Lee Spector.
- Mentors: Scott Niekum (UMass), Subhransu Maji (UMass), Jeff Clune (UBC, DeepMind), Joel Lehman (Stability AI), Masrour Zoghi (Google Research), Bryan Reimer (MIT).

Massachusetts Institute of Technology	Cambridge, MA
Graduate Study in Computer Science (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 - 2023.9

- Project: Meta-optimization for knowledge distillation.
- Hosts: Masrour Zoghi & Maryam Karimzadehgan.

Stability AI	Remote
Student Collaborator	2023.2 - 2023.6

- Project: Learning diversity from human feedback.
- Host: Joel Lehman.

Meta Reality Labs	Burlingame, CA
Research Scientist Intern	2022.5 - 2022.8

- Project: Image segmentation for AR/VR.
- Hosts: Wenliang Zhao & Hang Zhang.

Massachusetts Institute of Technology	Cambridge, MA
Research Affiliate	2020.7 - 2021.6
Research Engineer	2017.9 - 2020.6

- Project: Deep learning for driving scene perception and driver monitoring systems.
- PIs: Lex Fridman & Bryan Reimer.

[22] A. Ni, L. Ding, and L. Spector, "DALex: Lexicase-like selection via diverse aggregation," in *European Conference on Genetic Programming (EuroGP)*, Springer, 2024

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

[20] L. Spector, L. Ding, and R. Boldi, "Particularity," *Genetic Programming Theory and Practice XX*, 2023

[19] L. Ding, J. Terwilliger, A. Parab, M. Wang, L. Fridman, B. Mehler, and B. Reimer, "CLERA: A unified model for joint cognitive load and eye region analysis in the wild," *ACM Transactions on Computer-Human Interaction*, vol. 30, no. 6, 2023

[18] L. Ding and L. Spector, "Multi-objective evolutionary architecture search for parameterized quantum circuits," *Entropy*, 2023

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

[16] 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

[15] L. Ding, R. Sherony, B. Mehler, and B. Reimer, "Perceptual evaluation of driving scene segmentation," in *IEEE Intelligent Vehicles Symposium (IV)*, 2021

[14] 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

[13] 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

[12] 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

PEER-REVIEWED WORKSHOP PAPERS

[11] L. Ding, J. Zhang, J. Clune, L. Spector, and J. Lehman, "Quality diversity through human feedback," in *NeurIPS: Workshop on Agent Learning in Open-Endedness (**Spotlight presentation, 10.5% acceptance rate**)*, 2023

[10] L. Ding, M. Zoghi, G. Tennenholtz, and M. Karimzadehgan, "Ever evolving evaluator: Towards flexible and reliable meta-optimization for knowledge distillation," in *NeurIPS: Workshop on Adaptive Experimental Design and Active Learning in the Real World*, 2023

[9] R. Boldi, L. Ding, and L. Spector, "Objectives are all you need: Solving deceptive problems without explicit diversity maintenance," in *NeurIPS: Workshop on Agent Learning in Open-Endedness*, 2023

[8] 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

[7] 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

[6] 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

[5] 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

[3] L. Fridman, H. Schmidt, J. Terwilliger, and L. Ding, "Human interaction with deep reinforcement learning agents in virtual reality," in *NeurIPS: Deep Reinforcement Learning Workshop*, 2018

TECHNICAL REPORTS

[2] 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

[1] 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

INVITED TALKS

Towards flexible and reliable meta-optimization for efficient knowledge distillation.
Google Research.   2023.9

Particularity. (Joint talk w/ Lee Spector)
Genetic Programming Theory & Practice 2023.   2023.6

High-capacity image segmentation for AR/VR applications.
Meta Reality Labs.   2022.8

Optimizing neural networks with gradient lexicase selection.
UMass Amherst CICS (Autonomous Learning Lab).   2022.3

MIT DriveSeg dataset for dynamic driving scene segmentation.
Ford Research & Advanced Engineering.   2020.11
AutoSens 2020.   2020.9
MIT Advanced Vehicle Technology (AVT) Consortium.   2020.5
Toyota Motor North America.   2020.3

Data-driven computer vision research for human-centered autonomous vehicles.
UMass Amherst ECE (Software System Research Lab).   2021.6
Affectiva.   2020.3
MIT CSAIL (Data Systems Group).   2019.10

HONORS AND AWARDS	Conference Travel Scholarship ($3,000), *Google*.	2023
	SOAR (Supporting Open Access Research) Fund ($1,200), *UMass Amherst*.	2023
	4th Place (among 150 teams, top 3%), *MIT Miniplaces Challenge*.	2019
	Graduate Tuition Scholarship ($20,000), *University of Rochester*.	2016
	Excellent Youth of the Year (top 2%), *Central Univ. of Finance and Economics*.	2015
	Meritorious Winner (top 5%), *COMAP's Mathematical Contest In Modeling*.	2015

TEACHING EXPERIENCE

University of Massachusetts Amherst
- TA for COMPSCI 230: Computer Systems Principles. — 2021

Massachusetts Institute of Technology
- TA for 6.S094: Deep Learning for Self-Driving Cars. — 2018 - 2019
- TA for 6.S093: Human-Centered Artificial Intelligence. — 2019
- TA for 6.S099: Artificial General Intelligence. — 2018
- Co-instructor (w/ Tom Bertalan) for MIT Robocar Workshop. — 2018

SERVICES

ACADEMIC
- Ph.D. Admissions Committee (UMass CICS) — 2024

CONFERENCE REVIEWER / PROGRAM COMMITTEE
- International Conference on Learning Representations (ICLR) — 2024
- AAAI Conference on Artificial Intelligence (AAAI) — 2024
- Conference on Neural Information Processing Systems (NeurIPS) — 2023
- International Conference on Computer Vision (ICCV) — 2023
- Conference on Computer Vision and Pattern Recognition (CVPR) — 2023 - 2024
- International Joint Conference on Neural Networks (IJCNN) — 2022
- Intelligent Vehicles Symposium (IV) — 2021 - 2023
- British Machine Vision Conference (BMVC) — 2020 - 2021, 2023
- Conference on Automotive User Interfaces (AutoUI) — 2020
- GECCO: Quantum Optimization Workshop — 2022 - 2023

JOURNAL REVIEWER
- IEEE Transactions on Intelligent Vehicles
- Quantum Machine Intelligence
- Pattern Recognition
- IEEE Access
- IEEE Transactions on Circuits and Systems for Video Technology

OPEN SOURCE PROJECTS
- `facebookresearch/d2go`: Contributed to D2Go (a system from Meta Research for model training and deployment for mobile platforms).
- `mit-deep-learning`: Created open-access tutorials and coding assignments for MIT Deep Learning courses (9k+ stars on Github).
- `MIT AI Podcast`: Prepared interview materials for an open-access podcast hosted by Lex Fridman (now the *Lex Fridman Podcast*, ranked #1 on Apple Podcasts technology category).