# Li Ding

CONTACT
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RESEARCH
INTERESTS
Meta-learning and optimization, evolutionary computation, deep learning, computer vision, quantum computing, human-centered computing.

EDUCATION
**University of Massachusetts Amherst**, Amherst, MA
Manning College of Information & Computer Sciences
*Ph.D. in Computer Science*        2020.9 - (expected) 2024.9
- Principal area: artificial intelligence.
- Advisor: Lee Spector.

**Massachusetts Institute of Technology**, Cambridge, MA
Department of Electrical Engineering and Computer Science
*Graduate Study in Computer Science (non-degree)*        2019.9 - 2020.1

**University of Rochester**, Rochester, NY
Goergen Institute for Data Science
*M.S. in Data Science*        2016.6 - 2017.5
- Advisor: Chenliang Xu.

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

RESEARCH
EXPERIENCE
**Google Research**, Mountain View, CA (Remote)
*Research Intern*        2023.6 - present
- Project: Meta-optimization for deep learning.
- Hosts: Masrour Zoghi & Maryam Karimzadehgan.

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

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

**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.

**University of Rochester**, Rochester, NY

*Research Assistant* 2017.5 - 2017.8

- Project: Weakly-supervised human action recognition.
- PI: 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**, 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*, 2023

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

[3] **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

[4] 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

Probabilistic lexicase selection.
*Talk at GECCO 2023.*                                                          2023.7

Particularity.
*Talk at Genetic Programming Theory & Practice workshop.*                      2023.6

Optimizing neural networks with gradient lexicase selection.
*Poster at ICLR 2022.*                                                         2022.4
*Talk at UMass Amherst CICS (Autonomous Learning Lab).*                        2022.3

MIT DriveSeg dataset for dynamic driving scene segmentation.
*Talk at Ford Research & Advanced Engineering.*                                2020.11
*Talk at AutoSens 2020.*                                                       2020.9

Data-driven computer vision research for human-centered autonomous vehicles.
*Talk at UMass Amherst ECE (Software System Research Lab).*                     2021.6
*Talk at Affectiva.*                                                           2020.3
*Talk at Toyota Motor North America.*                                          2020.3
*Talk at MIT Advanced Vehicle Technology (AVT) Consortium.*                     2020.2
*Talk at MIT CSAIL (Data Systems Group).*                                      2019.10

Weakly-supervised action segmentation with iterative soft boundary assignment.
*Poster at IEEE CVPR 2018.*                                                     2018.6
*Poster at Center for Integrated Research Computing, Univ. of Rochester.*       2017.5

| 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
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| • 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*
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|---|---|
| • TA for COMPSCI 230: Computer Systems Principles. | 2021 |

*Massachusetts Institute of Technology*
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|---|---|
| • 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 |

SERVICES

PROGRAM COMMITTEE
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|---|---|
| • GECCO: Quantum Optimization Workshop | 2022 - 2023 |

CONFERENCE REVIEWER
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|---|---|
| • Conference on Neural Information Processing Systems (NeurIPS) | 2023 |
| • 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 - 2023 |
| • Conference on Automotive User Interfaces (AutoUI) | 2020 |

JOURNAL REVIEWER
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|---|---|
| • Pattern Recognition | 2023 |
| • IEEE Transactions on Circuits and Systems for Video Technology | 2018 - 2020 |

MISC.

OPEN SOURCE PROJECTS
- `mit-deep-learning`: Created coding tutorials and competitions for *MIT Deep Learning* courses (9k+ stars).
- `facebookresearch/d2go`: Contributed to D2Go (a system from Meta Research for model training and deployment for mobile platforms) during internship at Meta.

SIDE PROJECTS
- Prepared interview materials for *AI Podcast* with Lex Fridman (ranked #1 on Apple Podcasts in the technology category, 1M views on Youtube).
- 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.