Li Ding

Researcher · Engineer · Computer Vision · Autonomous Driving

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"I have no special talent. I am passionately curious." (Einstein, 1952)

Experience

Massachusetts Institute of Technology *Cambridge, MA*

Research Engineer with Dr. Lex Fridman *2017.9 - present*

- Working on various research projects related to deep learning and computer vision, jobs include algorithm development, model implementation, large-scale data management, presentation and publication, etc.
- Helping with teaching and other academic activities in and outside the institute.

University of Rochester *Rochester, NY*

Research Associate with Dr. Chenliang Xu *2017.5 - 2017.9*

- Worked on untrimmed video modeling and human activity recognition.

VisualDX Inc. *Rochester, NY*

Software Engineer Intern, Master Degree Practicum *2017.3 - 2017.5*

- Worked on abnormal user behavior detection using sequence modeling on web requests.

PricewaterhouseCoopers *Shanghai, China*

Data Scientist Intern, Bachelor Degree Practicum *2016.1 - 2016.4*

- Worked on statistical machine learning on large-scale insurance data.

Education

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*

Research Projects

Large-Scale Dynamic Driving Scene Segmentation

Research project at MIT supported by Toyota Collaborative Safety Research Center

- Study the value of temporal dynamics in the task of semantic segmentation.
- Propose a novel deep learning approach to model spatio-temporal context in order to improve driving scene perception under specific edge cases.
- Organize large-scale annotation process for the MIT DriveSeg dataset.

Pupil Movement Detection for Cognitive Load Estimation

Research project at MIT, collaborated with Google Research

- Lead and manage the whole pipeline of developing a generic human eye analysis model that is used to estimate human cognitive load level, including data collection, annotation, algorithm development and implementation.
- Propose a novel deep learning architecture for joint blink, pupil, and eye landmarks detection.

Black Betty: MIT Human-Centered Autonomous Vehicle

Research project at MIT, supported by Veoneer

- Work on the development and deployment of real-time perception and control system that enables conditional automation on a full-scale testing vehicle.
- Perform experiments to study shared autonomy between human and machine.

MIT Deep Learning Related Courses (`deeplearning.mit.edu`)

In-class and online courses at MIT, supported by MIT and Google Tensorflow

- Help with general curriculum development and course material preparation, especially on topics related to deep learning and computer vision.
- Create coding tutorials and maintain Github repository: `github.com/lexfridman/mit-deep-learning` (4.7k+ stars).

Human Action Recognition in Video Sequences

Research project at Univ. of Rochester, supported by NSF BIGDATA

- Study action recognition problem with different levels of supervision.
- Propose a novel training algorithm for weakly supervised action recognition and localization when only the order of action units are available.
- The achievements are published and presented at IEEE CVPR 2018.

Publications

Conference Proceedings

- **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.
- 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 and Preprints

- L. Fridman, **L. Ding**, B. Jenik, and B. Reimer, "Arguing machines: Human supervision of black box ai systems that make life-critical decisions," *arXiv preprint arXiv:1710.04459*, 2017.
- L. Fridman, D. E. Brown, M. Glazer, W. Angell, S. Dodd, B. Jenik, J. Terwilliger, J. Kindelsberger, **L. Ding**, S. Seaman, *et al.*, "MIT autonomous vehicle technology study: Large-scale deep learning based analysis of driver behavior and interaction with automation," *arXiv preprint arXiv:1711.06976*, 2017.
- **L. Ding** and C. Xu, "Tricornet: A hybrid temporal convolutional and recurrent network for video action segmentation," *arXiv preprint arXiv:1705.07818*, 2017.

Presentation

2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition *Salt Lake City, UT*

Poster Presentation *2018.6*

- Introduce and discuss our work about weakly-supervised action recognition.

2017 Annual Poster Session: Center for Integrated Research Computing *Rochester, NY*

Poster Presentation *2017.5*

- Introduce and discuss our work about action recognition and video modeling.

Academic Services

Reviewer

2018 IEEE Transactions on Circuits and Systems for Video Technology
2018 IEEE Access

Teaching Assistant

2018-19 MIT 6.S094: Deep Learning for Self-Driving Cars
2019 MIT 6.S093: Human-Centered Artificial Intelligence
2019 MIT 6.S091: Deep Reinforcement Learning
2018 MIT 6.S099: Artificial General Intelligence

Honors & Awards

Scholarships

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

Competitions

2017 **Bronze Medal** (192nd of 3343, top 6%), Kaggle - Statoil/C-CORE Iceberg Classifier Challenge
2017 **Bronze Medal** (107th of 1972, top 6%), Kaggle - Data Science Bowl (Lung Cancer Detection)
2015 **Meritorious Winner** (top 5%), COMAP's Mathematical Contest In Modeling

Skills

Language Chinese (native), English (working proficiency)
Programming Mainly using `Python`, familiar with `R`, `JavaScript`.
Deep Learning Mainly using `TensorFlow`, familiar with `PyTorch`, `Keras`, `Caffe`.
Others `Bash`, `Git`, LaTeX, `Docker`, `OpenCV`, `FFmpeg`, `ROS`, `TensorFlow.js`, `MySQL`.