

Zipeng (Mark) Fu

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Education

Carnegie Mellon University 8/2020 – 12/2021 (Expected)
Master of Science in Machine Learning

University of California, Los Angeles (UCLA) 9/2016 – 6/2020
Bachelor of Science in Computer Science and Engineering
Bachelor of Science in Applied Mathematics

- GPA: 3.801/4.000
- Cum Laude, Dean's Honor List

Research Interests

- Deep Learning (Reinforcement, Unsupervised, Meta)
- Computer Vision
- Robotics

Experiences

Center for Vision, Cognition, Learning and Autonomy (VCLA), UCLA Advisor: [Prof. Song-Chun Zhu](#)
Undergraduate Student Researcher 6/2018 – 1/2020
Graduate Student Researcher 6/2019 – 10/2019

- Researched on **deep reinforcement learning** methods for collaboration & communication in multi-agent environments
- Co-developed [And-Or Graph Library](#) in C++ for incremental structural learning
- Led TensorFlow-based reproduction of state-of-the-art deep reinforcement learning methods for benchmarking
- Researched on **unsupervised** Monte Carlo tree search of stochastic grammars for natural language processing
- Supervised enrollment process of master and undergrad students

Apex Lab, Shanghai Jiao Tong University Advisor: [Prof. Weinan Zhang](#)
Undergraduate Student Researcher 9/2019 – 12/2019

- Led research on multi-modal imitation learning for **robot control** in partially observable environments
- Led research on **StarCraft agents** by value-based multi-agent reinforcement learning with overestimation reduction

Physics of Amorphous and Inorganic Solids Lab (PARISlab), UCLA Advisor: [Prof. Mathieu Bauchy](#)
Undergraduate Student Researcher 3/2018 – 1/2019

- Researched on machine learning for material science
- Developed efficient empirical parametrizations based on neural networks and Gaussian process regression of interatomic potentials of several glass materials
- Developed Python package of derivative-free optimization for LAMMPS simulation
- Supervised enrollment process of undergrad student researchers and PhD positions in “Machine Learning for Material Science”

Shanghai University of Electric Power Advisor: [Prof. Mi Wen](#)
Winter Internship 12/2017 – 1/2018

- Researched on adversarial attack against scene recognition system for unmanned vehicles
- Researched on energy theft detection with energy privacy preservation in the smart grid

Publications (available at markfzp.github.io)

- **Z. Fu**, M. Liu, M. Zhou, W. Zhang, “Multi-Modal Imitation Learning in Partially Observable Environments,” Preprint. ([link](#))
- L. Yuan, **Z. Fu**, J. Shen, L. Xu, J. Shen, S.-C. Zhu, “Emergence of Pragmatics from Referential Game between Theory of Mind Agents,” Preprint. ([link](#))
- **Z. Fu**, Q. Zhao, W. Zhang, “Reducing Overestimation of Value Mixing in Cooperative Deep Multi-Agent Reinforcement Learning,” Preprint. ([link](#))
- L. Yuan, **Z. Fu**, L. Zhou, K. Yang, S.-C. Zhu, “Emergence of Theory of Mind Collaboration in Multiagent Systems,” in Emergent Communication Workshop at **NeurIPS 2019**. ([link](#))
- L. Yuan, **Z. Fu**, J. Shen, L. Xu, J. Shen, S.-C. Zhu, “Emergence of Recursive Teaching Protocol between Theory of Mind Agents,” in Emergent Communication Workshop at **NeurIPS 2019**. ([link](#))

- L. Yuan, J. Shen, **Z. Fu**, S.-C. Zhu, “Unsupervised Incremental Structure Learning of Stochastic And-Or Grammars with Monte Carlo Tree Search,” Preprint. ([link](#))
- H. Liu, **Z. Fu**, K. Yang, X. Xu, and M. Bauchy, “Machine learning for glass science and engineering: A review,” *Journal of Non-Crystalline Solids*, p. 119419, 2019. ([link](#))
- X. Wang, M. Wen, J. Li, **Z. Fu**, R. Lu, and K. Chen, “Adversarial attack against scene recognition system for unmanned vehicles,” in *Proceedings of the ACM Turing Celebration Conference - China*, ser. ACM TURC’19. New York, NY, USA: ACM, 2019, pp. 65:1–65:6. (Best Paper Runner-up Award, [link](#))
- D. Yao, M. Wen, X. Liang, **Z. Fu**, K. Zhang, and B. Yang, “Energy theft detection with energy privacy preservation in the smart grid,” *IEEE Internet of Things Journal*, pp. 1–1, 2019. ([link](#))

Professional Services

IEEE Internet of Things Journal

Reviewer

9/2019

Software Projects

And-Or Graph Library (C++11 & Boost)

VCLA, UCLA

- a machine learning library used as the **code framework** for graduate course CS266B (*Stat. Computing and Inference*) at UCLA
- used by about **50** people in the lab
- **2nd** major contributor, **6000** lines of C++, co-led the 3-month full-time software development
- Implemented, optimized and debugged several learning, search, parsing and graph algorithms, including Monte Carlo tree search, greedy search, beam search, backtracking, Metropolis-Hastings algorithms, Earley parser, and graph compression
- Used C++ techniques like templates, smart pointers, multi-index containers, functors and self-defined hashing
- Boosted the model performance from **0.64** to **0.80** in terms of F1 score

Mind Palace (Java & SQLite)

LA Hacks 2018

- an Android app to help people with Alzheimer’s diseases
- Built by using **Google Cloud**’s Vision and Natural Language pre-train models through REST APIs to search
- Sorted related images and texts stored on the device given photos and keywords based on similarity score

Honors

Spring 2020	Dean’s Honors List, UCLA School of Engineering
Fall 2019	Dean’s Honors List, UCLA School of Engineering
2019	ACM TURC’19 Best Paper Runner-up Award
Winter 2018	Dean’s Honors List, UCLA School of Engineering
Fall 2017	Dean’s Honors List, UCLA School of Engineering
Winter 2017	Dean’s Honors List, UCLA School of Engineering
2014	Bronze Medal, British Mathematical Olympiad
2014	Gold Award, British Physics Olympiad (AS Challenge)

Technical Skills

- C++/C, Python, Bash, Java, Verilog
- TensorFlow, PyTorch, Numpy, Git

Voluntary Activities

Upsilon Pi Epsilon, CA Beta Chapter, UCLA (Honor Society in Computer Science)

Member

5/2018 – 6/2020

- Voluntary tutoring for CS32 (Intro to CS II) and CS131 (Prog. Languages) every Tuesday and Thursday in Spring 2018

Center for Accessible Education, UCLA

Notetaker

9/2017 – 12/2018

- Voluntary notetaking of seven STEM courses for students enrolled in accessible education program at UCLA