# Zipeng Fu

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## Education

**Stanford University** 09/2022 –
PhD in Computer Science

**Carnegie Mellon University (CMU)** 8/2020 – 12/2021
Master of Science in Machine Learning
- Advised by Prof. Deepak Pathak and Prof. Jitendra Malik; GPA: 3.93 / 4.00
- Advanced courses: Advanced Machine Learning Theory, Graphical Models, Convex Optimization, ML with Large Datasets, Embodied Action and Perception, Learning for 3D Vision

**University of California, Los Angeles (UCLA)** 9/2016 – 6/2020
Bachelor of Science in Computer Science and Engineering
Bachelor of Science in Applied Mathematics
- Advised by Prof. Mathieu Bauchy, Prof. Song-Chun Zhu and Prof. Weinan Zhang; GPA: 3.801 / 4.000

## Research Interests

- Machine Learning, Robotics, Computer Vision

## Publications (available at markfzp.github.io)

**Coupling Vision and Proprioception for Navigation of Legged Robots** CVPR 2022
**Z. Fu***, A. Kumar*, A. Agarwal, H. Qi, J. Malik, D. Pathak

**Minimizing Energy Consumption Leads to the Emergence of Gaits in Legged Robots** CoRL 2021
**Z. Fu**, A. Kumar, J. Malik, D. Pathak

**RMA: Rapid Motor Adaptation for Legged Robots** RSS 2021
A. Kumar, **Z. Fu**, D. Pathak, J. Malik

**Reducing Overestimation of Value Mixing in Cooperative Deep Multi-Agent Reinforcement Learning** ICAART 2020
**Z. Fu**, Q. Zhao, W. Zhang

**Multi-Modal Imitation Learning in Partially Observable Environments** Preprint 2020
**Z. Fu**, M. Liu, M. Zhou, W. Zhang

**Emergence of Theory of Mind Collaboration in Multi-Agent Systems** NeurIPS 2019 Workshop
L. Yuan, **Z. Fu**, L. Zhou, K. Yang, S.-C. Zhu

**Emergence of Pragmatics from Referential Game between Theory of Mind Agents** NeurIPS 2019 Workshop
L. Yuan, **Z. Fu**, J. Shen, L. Xu, J. Shen, S.-C. Zhu

**Machine Learning for Glass Science and Engineering: A Review** Journal of Non-Crystalline Solids 2019
H. Liu, **Z. Fu**, K. Yang, X. Xu, and M. Bauchy

**Adversarial Attack Against Scene Recognition System for Unmanned Vehicles** ACM Turing Celebration Conference 2019
X. Wang, M. Wen, J. Li, **Z. Fu**, R. Lu, and K. Chen Best Paper Runner-up Award

**Energy Theft Detection with Energy Privacy Preservation in the Smart Grid** IEEE Internet of Things Journal 2019
D. Yao, M. Wen, X. Liang, **Z. Fu**, K. Zhang, and B. Yang

## Experiences

**Robotics Institute, Carnegie Mellon University** Advisor: Prof. Deepak Pathak and Prof. Jitendra Malik
Graduate Student Researcher 9/2020 – Current
- Leading research on embodied intelligence, robot learning and Sim2Real transfer with a focus on mobile robots

- Leading research on learning synergy among vision, planning, and control grounded in joint navigation and locomotion
- Leading research on learning robust domain adaptation for legged locomotion

**Center for Vision, Cognition, Learning and Autonomy (VCLA), UCLA** Advisor: Prof. Song-Chun Zhu (On Leave)
Undergraduate 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 recruitment process of master and undergrad students

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

- Led research 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"

**Apex Lab, UCLA** Advisor: Prof. Weinan Zhang
Undergraduate Student Researcher 9/2019 – 12/2019

- Led research on multi-modal imitation learning for MuJoCo locomotion tasks in partially observable environments
- Led research on StarCraft agents' cooperation by multi-agent reinforcement learning

## Professional Services

**Robotics:** reviewer of CoRL (2022), RA-L (2022), IROS (2022)
Misc.: reviewer of IEEE IoT Journal (2020, 2022)

## Software Projects

**And-Or Graph Library (C++11 & Boost)** [https://github.com/MarkFzp/and-or-graph-lib] 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)** [https://github.com/KeplerC/Mind-Palace] 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

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| 2020 | Cum Laude, UCLA |
| 2020 | Dean's Honors List, UCLA School of Engineering |
| 2019 | Dean's Honors List, UCLA School of Engineering |
| 2019 | ACM TURC'19 Best Paper Runner-up Award |
| 2018 | Dean's Honors List, UCLA School of Engineering |
| 2017 | Dean's Honors List, UCLA School of Engineering |
| 2014 | Bronze Medal, British Mathematical Olympiad |

## Technical Skills

- C++, Python, Bash, C
- PyTorch, TensorFlow, Numpy, Git, ROS, IsaacGym, MuJoCo, PyBullet, RaiSim