Jiajun **Fan**

📱 (+86) 17822018001 | ✉ fanjj21@mails.tsinghua.edu.cn | 🏠 jiajunfanthu.github.io

Education

Tsinghua University   *Beijing, China*

MASTER OF ELECTRONIC INFORMATION (COMPUTER SCIENCE)   *Aug 2021 - Jun 2024 (Expected)*

Nankai University   *Tianjin, China*

BACHELOR OF INTELLIGENT SCIENCE AND TECHNOLOGY   *Sep 2017 - Jun 2021*
- GPA: 3.93/4.0
- Courses: Reinforcement Learning, Computer Vision, Computer Composition Principle, Probability Theory and Mathematical Statistics

Academic Experience

Research on High-efficiency Reinforcement Learning Algorithm   *Beijing, China*

$\mathcal{R\&D}$ INTERN   *Sep 2020 - Jun 2021*
- I extended the basic paradigm of RL called the Generalized Policy Iteration (GDI) into a more generalized version, which is called the Generalized Data Distribution Iteration (GPI).
- I unified massive RL algorithms and techniques into the GDI paradigm, which can be considered as one of the special cases of GDI.
- I provided theoretical proof of why GDI is better than GPI and how it works.
- My work has achieved SOTA and broken through massive human world records.
- I have published a paper called "GDI: Rethinking What Makes Reinforcement Learning Different From Supervised Learning" and several patents.

Research on Model-free Reinforcement Learning Algorithm   *Beijing, China*

$\mathcal{R\&D}$ INTERN   *Sep 2020 - Jun 2021*
- I proposed a unified framework of model-free reinforcement learning called CASA.
- I proposed an entropy regularization free mechanism for policy-based reinforcement learning based on bandits.
- I have published two papers called "CASA-B: A Unified Framework of Model-Free Reinforcement Learning" and "An Entropy Regularization Free Mechanism for Policy-based Reinforcement Learning". Additionally, I have published several patents.

Research on Model-based Reinforcement Learning Algorithm   *Tianjin, China*

$\mathcal{R\&D}$ INTERN   *Apr 2020 - Sep 2020*
- I proposed a novel method to improve the algorithm learning framework and test the algorithm performance on the MuJoCo simulation environment.
- I published a paper called "Critic PI2: Master Continuous Planning via Policy Improvement with Path Integrals and Deep Actor-Critic Reinforcement Learning".

Multifunctional Home Service Robot   *Tianjin, China*

$\mathcal{R\&D}$ INTERN   *Sep 2018 - Jul 2019*
- I proposed a solution for the entire project and a finite state machine diagram.
- I implemented autonomous navigation and RRT path planning related algorithms based on ROS.
- Project results have been presented in the 2019 ROBOCUP Sydney World Finals.

Publications

Paper
- **Fan, J.**, Xiao, C., & Huang, Y. (2021). GDI: Rethinking What Makes Reinforcement Learning Different From Supervised Learning. arXiv preprint arXiv:2106.06232.
- **Fan, J.**, Ba, H., Guo, X., & Hao, J. (2020). Critic PI2: Master Continuous Planning via Policy Improvement with Path Integrals and Deep Actor-Critic Reinforcement Learning. arXiv preprint arXiv:2011.06752.
- Xiao, C., Shi, H., **Fan, J.**, & Deng, S. (2021). An Entropy Regularization Free Mechanism for Policy-based Reinforcement Learning. arXiv preprint arXiv:2106.00707.
- Xiao, C., Shi, H., **Fan, J.**, & Deng, S. (2021). CASA-B: A Unified Framework of Model-Free Reinforcement Learning. arXiv preprint arXiv:2105.03923.

Patent

- **Fan, J.** "Hyperparameter determination method, device, deep reinforcement learning framework, medium and equipment." CN113052252A. 2021.06.29.
- **Fan, J.** "Hyperparameter determination method, device, deep reinforcement learning framework, medium and equipment. "CN113052253A. 2021.06.29.
- **Fan, J.** "Hyperparameter determination method, device, deep reinforcement learning framework, medium and equipment." CN113052248A. 2021.06.29.
- **Fan, J.** "Training method, device, medium and electronic equipment of deep reinforcement learning model." CN113052312A. 2021.06.29.
- **Fan, J.** "Hyperparameter determination method, device, deep reinforcement learning framework, medium and equipment." CN112949850A. 2021.06.11.
- **Fan, J.** "Hyperparameter determination method, device, deep reinforcement learning framework, medium and equipment." CN112926629A. 2021.06.08.
- **Fan, J.**, Xiao, C. "Method, device, learning framework, medium and equipment for determining action value." CN112926628A. 2021.06.08.
- **Fan, J.**, Xiao, C. "Training method, device, medium and electronic equipment of deep reinforcement learning model." CN112926735A. 2021.06.08.
- **Fan, J.**, Xiao, C. "Training method, device, medium and electronic equipment of deep reinforcement learning model." CN112926629A. 2021.05.07.

Awards

2021	**Outstanding Graduates**, Nankai University	*Tianjin, China*
2021	**Excellent Graduation Thesis**, Nankai University	*Tianjin, China*
2021	**Tang Lixin Scholarship**, Nankai University	*Tianjin, China*
2020	**National Scholarship**, Nankai University	*Tianjin, China*
2020	**Nomination for Zhou Enlai Scholarship**, Nankai University	*Tianjin, China*
2019	**National Scholarship**, Nankai University	*Tianjin, China*
2019	**3st Prize**, Robocup@HOME Education World Final	*Sydney, Australia*
2019	**Bronze Medal**, ACM / ICPC Asia Regional Contest	*Xuzhou, China*
2018	**National 2st Prize**, National College Students Mathematical Contest in Modeling	*Tianjin, China*
2018	**The First Prize Scholarship**, Nankai University	*Tianjin, China*