Chao Wen

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Education

- **Nanjing University of Aeronautics and Astronautics (NUAA)** — Nanjing, China
  M.S. in Computer Science; (Advisor: Prof. Xiaoyang Tan) — *Sept. 2018 – Apr. 2021*
- **Anhui University of Technology (AHUT)** — Anhui, China
  B.S. in Network Engineering; (GPA: 89.2/100*; Rank:* 1^{st}/89*)* — *Sept. 2014 – Jun. 2018*
- **National Yunlin University of Science and Technology (YunTech)** — Taiwan, China
  Exchange student in Computer Science and Information Engineering; — *Feb. 2016 – Jul. 2016*

Research Interests

- **Reinforcement Learning**: (1) design sample efficient RL algorithms; (2) apply RL to real-world applications;
- **Multi-Agent Systems**: (1) build multi-agent systems using deep RL; (2) communication in multi-agent systems;

Publications

- *SMIX(λ): Enhancing Centralized Value Functions for Cooperative Multi-Agent Reinforcement Learning*
  Chao Wen*, Xinghu Yao*, Yuhui Wang, Xiaoyang Tan.
  In: Proceedings of the 34th AAAI Conference on Artificial Intelligence **(AAAI 2020)**, link
- *Truly Proximal Policy Optimization*
  Yuhui Wang, Hao He, **Chao Wen**, Xiaoyang Tan.
  Arxiv **(Under Review)**, link

Patents

- *An off-policy method based on λ-return for cooperative multi-agent reinforcement learning.*
  Xiaoyang Tan, **Chao Wen**, Xinghu Yao. ID: 201911373178.X (in process)

Experience

- **Nanjing University of Aeronautics and Astronautics** — Nanjing, China
  Graduate Student and Teaching Assistant — *Sept. 2018 – Present*
  - **Research Assistant - Parnec Group**:
    1. Design sample efficient RL algorithms & cooperative multi-agent reinforcement learning algorithms.
    2. Developed *PyRL* - a modular framework for research in deep reinforcement learning. This project has implemented several state-of-the-art RL algorithms (e.g., A2C, DQN, DDPG, TD3, PPO, SAC) in a modular architecture, making it easy to develop new algorithms. (link)
    3. Developed *DeepMARL* - a multi-agent reinforcement learning framework implemented in a similar modular architecture as *PyRL* under *multi-agent mujoco* environment. DDPG, MADDPG, FacMADDPG, and COMIX are implemented in this framework (not open source yet).
  - **Project Leader - Research Project on Cooperative Multi-Agent Reinforcement Learning**:
    1. Based on centralized training, decentralized execution paradigm, design sample efficient MARL algorithms.
    2. This research project was funded by NUAA with 5,500 RMB.
  - **Teaching Assistant - The C Programming Language**:
    1. This course had more than 100 students enrolled.
    2. Involved in creating assignments, exams and answering questions.
- **Synced** — Beijing, China
  Algorithm Engineer Intern — *Jun. 2018 – Aug. 2018*
  - **Data Crawling and Analysis**:
    1. Data crawling, processing, and analysis using Python libraries like Beautiful Soup, Regex and lxml;
    2. Data source was from a variety of websites such as Google, Wikipedia and AI conference websites;

3. Data was analysed using machine learning algorithms including SVM and deep learning.

- **SyncedLeg Project (code, article)**:
  1. SyncedLeg is a customizable tool for mining influential keywords from large corpus.
  2. Responsible for the algorithm design, implementation, code integration, and documentation.
  3. This project was originated from a competition, in which our team won the 1^{st} prize (6,000 RMB).

- **National Yunlin University of Science and Technology** — Taiwan, China
  Exchange Student — *Feb. 2016 – July. 2016*
  - Took in some specialized courses such as *Operating Systems*, *Pattern Recognition*, *Algorithm Design and Analysis* and *Digital Logic Design*;
  - Got the highest score in two courses - *Algorithm Design and Analysis* and *Digital Logic Design*;

- **Anhui University of Technology** — Anhui, China
  Undergraduate Student — *Sept. 2014 - Jun. 2018*
  - **Thesis - A Study of Policy Gradient Methods Based on Deep Reinforcement Learning**:
    1. Policy gradient suffers from the notorious variance issue. This thesis investigated the performances of three methods for reducing the variance of policy gradient, namely *baseline*, *advantage normalization* and *reward-to-go*.
    2. This thesis won the *Outstanding Bachelor's Thesis Award* of AHUT.

Selected Projects

- **PyRL**: This project has implemented several state-of-the-art RL algorithms in PyTorch, such as DQN, A2C, DDPG, TD3, PPO and SAC. The modular architecture and readable code make it easy to design new RL algorithms under this framework. (link)
- **DeepMARL**: This project has implemented several multi-agent reinforcement learning algorithms, including MADDPG, FacMADDPG and COMIX, under continuous environment multi-agent mujoco in a modular architecture. (not open source yet)
- **Pass-Nuaa-Lab-Exam**: This is a Python script used for automatically passing a compulsory lab examination in NUAA. Taking advantage of Selenium package and socket programming, this script could crawl the data from the Internet and answer the questions in just 1 minute! (link)
- **SyncedLeg**: SyncedLeg is a customizable tool for mining influential keywords from large corpus. (link)

Skills

- **English**: CET-6: 553, IELTS (in preparation).
- **Programming**: Python, C/C++.
- **Libraries**: Pytorch(prefered), Tensorflow.
- **OS**: GNU/Linux (Ubuntu), Microsoft Windows.
- **Other**: Vim, Git, LaTeX, SQL.

Awards

- First-Class Academic Scholarship for Graduate Students (10,000 RMB) — NUAA, Dec. 2019
- Outstanding Graduate of Anhui Province (top 5%) — AHUT, Sept. 2018
- Outstanding Bachelor's Thesis Award of AHUT (top 2%) — AHUT, Sept. 2018
- The 1^{st} Prize in Synced Hack Weekend Competition (6,000 RMB) — Synced, Aug. 2018
- First-Class Scholarship (top 5%) — AHUT, Dec. 2017
- The 3^{rd} Prize in the 7^{th} China National College Student E-Commerce Challenge — AHUT, Jun. 2017
- **National Scholarship (top 1%, 8,000 RMB)** — AHUT, Dec. 2016
- Special Scholarship (top 2%) — AHUT, Dec. 2016
- First-Class Scholarship (top 5%) — AHUT, Dec. 2015

Social Work

- Member of International Department of the Graduate Student Union — NUAA, Sept. 2018 – Present
- Vice-Minister of Science and Technology Department of Student Union — AHUT, Sept. 2015 – Sept. 2016
- Volunteer for International Students — AHUT, Sept. 2015 – Dec. 2015

Interests

- **Sports**: swimming, table tennis, badminton, running, hiking;
- **Other**: coding, reading, movie

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