Chang Ye

347-320-1201 | yooceii19960620@gmail.com | https://yooceii.github.io | github.com/yooceii

Education

New York University — New York, NY
Master of Science in Computer Science. 3.778/4.0 — *Aug. 2018 - May 2020*

Dalhousie University — Halifax, NS, Canada
Joint Program in Computer Science. 3.44/4.3 — *Aug. 2017 - April 2018*

Zhejiang University of Technology — Hangzhou, ZJ, China
Bachelor of Engineering in Software Engineering. 3.3/4.0. Ranking: 24/186 — *Aug. 2014 - Jun 2017*

Research Interest

- Neuroscience and psychology inspired RL.
- Causal Representation learning in RL.

Publication (*=Equal Contribution)

- Y. Yao*; **C. Ye***; J. He; GF. Elsayed. Teacher-generated pseudo human spatial-attention labels boost contrastive learning models. *SVRHM Workshop@ NeurIPS*, 2022. [paper]
- H. Shengyi; R.F.J. Dossa; **C. Ye** and J. Braga. CleanRL: High-quality Single-file Implementations of Deep Reinforcement Learning Algorithms. *Journal of Machine Learning Research (JMLR)*, 2022. [paper, code]
- **C. Ye**; A. Khalifa; P. Bontrager and J. Togelius. Rotation, Translation,and Cropping for Zero-Shot Generalization. *IEEE Conference on Games (CoG)*, 2020. (39.9% Acceptance Rate) [paper, code, presentation]
- **C. Ye***; G. Mittal*; Y. ruksachatkun*; L. Cui*. SeqG(SC)AN: SeqGAN baseline for Grounded SCAN. DS-GA 1016 Final Project. [paper, code, Course Website]
- **C. Ye** and M. Heywood. Uniform Cost Search in Procedural Content Generation for Angry Bird Games. Honour Thesis. [paper, code]

Experience

Research Intern — Jan 2019 - Jul 2021
New York University, Game Innovation Lab, Supervisor: Julian Togelius — *New York, NY*

- Designed and executed the **MAP-Elites** algorithm to explore the generalization in policy space. Created t-SNE plots to visualize the search space.
- Implemented an RL algorithm that adopts data-augmentation techniques and showed that it improved generalization.
- Utilized an **imitation learning** algorithm to learn MCTS policies by training an embedding that maintains sequence information. Trained an RL agent that uses the embedding as an extra reward.

Google LLC — California, United States
Software Engineer — *August 2021 - Present*

- Designed a system to automatically validate and alert supply forecast signals in Golang by using RPC and internal toolstack that runs on multiple data centers.

Projects

Curiosity-based reinforcement learning — July 2020 - Jan 2021

- Reimplemented the **random network distillation** algorithm in PyTorch and achieved state-of-the-art performance. The code is submitted to the Github repository, CleanRL which has around **300** stars on GitHub.
- Designed a new curiosity reward based on the difference between RND's curiosity reward in 2 consecutive steps.

Policy-Dynamics Value function (PD-VF) extension, collaborated with PD-VF's author — Sep 2020 - Jan 2021

- Designed a transformer encoder that takes rewards, states and actions as input, and a feed-forward network decoder that takes states and actions as input and outputs rewards. Trained network by using the ℓ_2 error of predicted rewards and real rewards as the objective function.
- Performed an ablation study by training PPO agents conditioned on learned embeddings.

Representation learning for reinforcement learning — Feb 2020 - March 2020

- Designed an algorithm that learns a suitable representation while performing policy gradient by incorporating **SimCLR** structure into the standard A2C algorithm.
- Created an asynchronous version that learns representations simultaneously. Added more data augmentation options

Human-face recognition and mosaic — Jan 2016 – May 2016

- Utilized **histogram equalization** in **OpenCV** to solve the low contrast problem that causes the face recognition algorithm unable to recognize the face features. The face recognition rate improved **30%** by adopting that technique.
- Took function from **Dlib** to extract face features and used these features to designed a module that can efficiently locate the multiple facial features on multiple faces and convert them to contours for Gaussian blur purpose.
- Designed the whole backend pipeline, implemented in **C++** under the **Qt** platform and ran backend unit tests. Built the system that is able to process up to **40** frames per sec with ignorable latency. The system achieved a **95%** detection rate in the real-time video under a low-light environment.

Teaching

Course Assistant

New York University *New York, NY*

- CS-GY 6943 AI for Game. Instructor: Julian Togelius (2020 Spring)
- ECE-GY 6143 Introduction to Machine Learning. Instructor: Anna choromanska (2019 Fall)

Technical Skills

Languages: Python, Go, Java, C++, C, C#, Shell, SQL, Haskell, Matlab
Software & Tools: PyTorch, JAX, Tensorflow, OpenAI Gym, OpenAI Baseline, Numpy, Scipy, Git, LaTeX, .Net, Vim, Tmux