PERSONAL INFORMATION

Name: Yu-Ren Liu (刘驭壬) Gender: Male Birthdate: April 8, 1996
Institution: Department of Computer Science and Technology, Nanjing University, China
Position: Ph.D. student Supervisor: Yang Yu
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EDUCATION

- **2018.9~present**

  Ph.D. student: Computer Science and Technology, Department of Computer Science and Technology, Nanjing University

- **2014.9~2018.6**

  B.Sc. degree: Computer Science and Technology, Kuang Yaming Honors School (Elite Plan, recommend enrollment without requiring college entrance examination), Nanjing University, China.

RESEARH

My research interests lie in **realizing the decision-making intelligence** in practical challenges. A key approach is to apply (deep) reinforcement learning in real-world problems. During the past few years, I worked on several interesting topics including derivative-free optimization, dynamic environment reconstruction by generative adversarial imitation learning (GAIL) and tabular data synthesis with privacy guarantees by GANs. In the next few years, I would like to tackle challenges in making RL methods stronger and more applicable to real-world problems, for example, integrating RL with casual inference, which is called **Causal RL**, and reconstructing a robust and dynamic environment for reinforcement learning, which can be considered to be a **model-based RL method.**

The idea of integrating RL with casual inference (Causal RL) is very attracting. The goal of the RL agent is to maximize the expected accumulated reward, while RL itself does not have the ability to conduct causal inference. Causal inference can assist RL in learning value functions or policies more efficiently and effectively through inferring causal relations between states or between states and actions, such as reducing the state or action space and handling confounders. Causality and RL are complementary and can be integrated from the causal perspective to enhance both.

Directly applying RL in the real environment will cause unbearable cost. Our group's previous studies have discovered that it is feasible to build virtual environments with good generalizability solely from the historical data. These environments enable zero-cost trial-error training for industrial applications. Now, I am also working on this topic in an attempt to create a more robust environment.

Codes

Github: https://github.com/AlexLiuyuren?tab=repositories

- ZOOpt: I am a core developer of the open source python package ZOOpt, which provides efficient derivative-free solvers and is designed easy to use. ZOOpt toolbox

particularly focuses on optimization problems in machine learning, addressing high-dimensional, noisy, and large-scale problems.

PUBLICATION LIST

Manuscripts

- **Yu-Ren Liu**, Yi-Qi Hu, Hong Qian, Yang Yu, and Chao Qian. *ZOOpt: Toolbox for derivative-free optimization.* arXiv:1801.00329, 2018.

Conference Paper

- **Yu-Ren Liu**, Yi-Qi Hu, Hong Qian, Yang Yu. *Asynchronous Classification-Based Optimization*. In: **Proceedings of the 1st International Conference on Distributed Artificial Intelligence (DAI'19)**, Beijing, China, 2019 (PDF).

INTERNSHIP

- **2018.9~2019.9: Sinovation AI Institute (创新工场人工智能研究院)**

  Part-time Quantitative Researcher
  My work aimed at reconstructing a virtual stock market model from historical data. The model works as a dynamic environment which enables zero-cost trial-error training of the trading policy. In addition, the model can be used to detect market signal, thereby being utilized for existing predictive models.
- **2018.3~2018.7: Meridian Global Inc – YRTech (子午投资-跃然科技)**

  Quantitative Researcher
  My work focused on searching effective factors at the Chinese A-share market. During the internship, I built a distributed optimization system for searching market factors. The system has been validated in the back test and been used for the real market

REWARDS & HONORS

- Postgraduate Elite Scholarship (top 10%), Nanjing University, 2019
- First-Class Academic Scholarship (top 20%), Nanjing University, 2018, 2019
- Undergraduate Elite Scholarship, Nanjing University, 2015, 2016, 2017
- Second-Class People's Scholarship, Nanjing University, 2015
- Citi Cup Innovation and Application Contest Top 20 in China, Xian, 2016

TEACHING ASSISTANT

Introduction to Artificial intelligence (with Prof. Yang Yu; for undergraduate students), Fall, 2019

CERTIFICATE

- August, 2019: I completed the courses at the Machine Learning Summer School held in Skoltech, Moscow, Russia. (Certificate)

PROFESSIONAL AFFILIATIONS

China Computer Federation (CCF): Student member
Chartered Financial Analyst (CFA): CFA level 1 candidate

MINOR

Finance
I am a CFA level 1 candidate and have systematically learned the courses on Economics, Portfolio Management, Equity Investment, Fixed Income, Derivatives and Alternative Investments.

LANGUAGES

Mandarin: Native Language
English: Fluent, Advanced Reading and Writing