

Licheng Luo

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EDUCATION

University of Virginia

Master of Science in Computer Science

Charlottesville, VA

August 2023 - Present

- GPA: 4.0
- Advisor: Shangdong Zhang

Huazhong University of Science & Technology

Honour Bachelor of Science in Electronic Engineering

Wuhan, Hubei

August 2019 - June 2023

- GPA: 3.78 with Outstanding Graduate Honour
- Advisor: Xin Yang

RESEARCH INTERESTS

Reinforcement Learning; Robust Reinforcement Learning;
Machine Learning Applications, especially in Robotics and Autonomous Driving
Motto: Prove before implement and avoid random combinations

RESEARCH EXPERIENCE

Robust Markov Decision Processes with Transition Gradient Theorem

1/2024 – Present

Advised by Prof. Shangdong Zhang

Charlottesville, VA

- Proved the equivalence between finding the optimal adversary and finding the optimal policy in a regular MDP
- Proved the belman contraction of the optimal adversary, which shows the generated adversary will be converge to a fixed points
- Show the Markov optimality of this two player problem
- Propose the transition gradient theorem through which we can get the transition that minimizes the culmulated rewards

Reinforcement Learning with non-human feedback

11/2023 – 3/2024

Advised by Prof Chen-Yu Wei

Charlottesville, VA

- Designed a predefined reward model to take place of reward model in RLHF
- Implemented this idea by TRL framework
- People can find Report *here*, the similar idea was published by DeepMind Reseach, you can find their work *here*

Severity Analysis of COVID-19 Through Medical Images

6/2022 – 8/2023

Research Assistant jointly at MClab at HUST and Imaging Lab at Tongji Medical College

Wuhan, China

- Complete mutual-information-based image registration, implemented CNN-based analysis framework, leverage multi-headed self-attention to perform auto focus on ROI
- Process and analyze time-series images via LSTM
- People can find paper *here*

COVID-19 Lesion Segmentation

10/2021 – 4/2022

Research Assistant jointly at MClab at HUST and Xiehe Mecical College

Wuhan, China

- Implemented Cross Pseudo Supervision and a confidence-weighted teacher model
- Achived 4% higher accuracy than CPS in ACDC 2017 and achived 92.61% accuracy in the real pulmonary dataset provided by Xiehe hospital

RELATED PAPERS & WORKING MANUSCRIPTS

Licheng Luo, Shangtong Zhang[†], 2024. *Policy Optimization in Robust Markov Decision Processes with Transition Gradient Theorem*. Working Manuscript

Licheng Luo, Kefan Song, Ye Ma, 2024. *Reinforcement Learning with Non-human Feedback*. ML Symposium of UVA

Yajie Chen*, Henghui He*, **Licheng Luo***, Xin Yang[†], Qian Liu[†], 2023. *Studying pulmonary fibrosis due to microbial infection via automated microscopic image analysis*. Frontiers in Microbiology

HONORS & COMPETITION

- *Outstanding Graduate (Fall 2023, HUST)*
- *The 2nd Asia Pacific Tele-Ophthalmology Society (APTOS) Big Data Competition (8/2021 – 12/2021): ranked **12/10006** in the competition*
- *Inspiration Scholarship (Fall 2021, HUST)*
- *Study Scholarship (Spring 2020, Spring 2021, Fall 2021, Fall 2022, HUST)*

SKILLS

Coding: Python (proficient), C++, Java, LaTeX, Linux

Learning Framework: NumPy, Pandas, Matplotlib, Torch, JAX

Knowledge: Reinforcement Learning, Machine Learning, Deep Learning for Computer Vision, Signal Processing