

蔡宜樺 Eva Tsai

National Yang Ming Chiao Tung University (NYCU) | Electrical Engineering | Senior Student

I extensively join relevant projects and courses in wireless communication and computer science. I am highly interested in machine learning and 6G communication network. I hope to get a MS CS degree in Taiwan.

 [My GITHUB](#)

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RESEARCH

6G Reinforcement Learning for Wireless System Optimization

Research Assistant, Mobile Intelligent Network Technology Lab, NYCU Jan 2024 - present

- Construct a multi-STAR-RISs (Simultaneously Transmitting And Reflecting Reconfigurable Intelligent Surface) in MIMO network, and aim to maximize QoS of users while guaranteeing practical constraints.
- Apply deep learning (q-learning) and genetic algorithm to efficiently solve the data rate optimization problem.
- The result shows an increment of data rate up to 50%.

Antenna Array Signal Processing

Research Assistant, Transmission and Networking Technologies Lab, NYCU Sep 2023 - Jan 2024

- Apply beamforming and modulation techniques to process incoming signals.
- Study direction-of-arrival estimation of the receiving signals of the antenna array.
- We can track the direction and the velocity of the signals by the above techniques.

PROJECT

A Reinforcement Learning Solver for maze routing Dec 2023 - Mar 2024

- Introduce q-learning to optimize the solution of a maze game.
- After 30 iterations, it shows 90% reduction of the steps of the q-learning agent.
- It can be further optimized by introducing other short path algorithm (e.g., Dijkstra algorithm).

Ordinary Differential Equation in Practical Circuit Sep 2021 - Jan 2022

- Propose a circuit consist of electronic components To utilize what is learned in ODE course, and dive into the mathematics (ODE) behind this circuit.
- We use Python- Numpy, Matplotlib, Scipy... to do the simulation and visualization of our practical circuit.
- Consolidate knowledge in mathematics (ODE), electronic circuit, and coding.

SKILLS

Python/ C++/ Matlab

- Intelligent Wireless Communication
- Signal Processing

Git

- Github
- Markdown

AI Tools

- ML/ RL (Reinforcement Learning)
- Performance Optimization