Yan-Ru Ju

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EDUCATION

EXPERIENCE

• Institute of Information Science, Academia Sinica [

Aug 2023 - Present

Research Assistant

Taipei, Taiwan

- Projects:
 - VQ-VAE for imperfect information game
 - ResTNet
 - Interpreting the Dynamics model in MuZero Planning
 - Large language model + Tree Search Methods
- Developed board game environments and analyzing tools in MiniZero
- Assisted the professor in reviewing academic papers.

• Agricultural Biotechnology Research Center, Academia Sinica [

Aug 2019 - Aug 2020

Taipei, Taiwan

- Bioinformatics Lab of Prof. Shau-Ping Lin
- Established bioinformatic pipelines for analyzing microRNA and piRNA.
- Built a web embedded with Google map API for estimating profits and costs including fares for egg layer companies.

PUBLICATIONS

Research Assistant

- [1] Yan-Ru Ju, Tai-Lin Wu, Chung-Chin Shih, Ti-Rong Wu (2025). Bridging Local and Global Knowledge via Transformer in Board Games. In Proceedings of the 34th International Joint Conference on Artificial Intelligence (IJCAI-2025). DOI: 10.48550/arXiv.2410.05347.
- [2] Hung Guei, Yan-Ru Ju, Wei-Yu Chen, Ti-Rong Wu. (2025). Demystifying MuZero Planning: Interpreting the Learned Model. In *IEEE Transactions on Artificial Intelligence*. DOI: 10.1109/TAI.2025.3591082.
- [3] Yan-Ru Ju*, Long-Shang Cho, and Chin-Lung Lu. (2025). A More Efficient Dynamic Programming Algorithm for Designing a Coding Sequence by Jointly Optimizing Its Structural Stability and Codon Usage. In *IEEE Transactions on Computational Biology and Bioinformatics*. DOI: 10.1109/TCBBIO.2025.3596771.
- [4] Hung Guei, Yan-Ru Ju, Wei-Yu Chen, Ti-Rong Wu. (2024). Interpreting the Learned Model in MuZero Planning. In *Proceedings of Technologies and Applications of Artificial Intelligence (TAAI 2024)*. DOI: 10.48550/arXiv.2411.04580.
- [5] Shu-Cheng Liu, Yan-Ru Ju, Chin Lung Lu. (2022). Multi-CSAR: A Web Server for Scaffolding Contigs Using Multiple Reference Genomes. In *Nucleic Acids Research, Volume 50, Issue W1, Pages W500–W509*. DOI: 10.1093/nar/gkac301.
- [6] Shau-Ping Lin, Hsiang-Hsuan Lin Wang, Jing-Wen Huang, Mingche Kuo, Yi-Tzang Tsai, Chia-Chen Lu, Yan-Hong Chen, Frederick Kin Hing Phoa, Pin-Jui Kung, Yan-Han Lin, Yung-Tsai Chu, Yan-Ru Ju, Tang-Long Shen, Chien-Tai Hong, Takahiro Ochiya, Koji Ueda, and Ruey-Meei Wu. (2024). Cholesterol homeostasis and oxidative stress-relatednovel plasma biomarkers for MSA patients. In NPJ Parkinsons Dis (Under Revision). DOI: 10.21203/rs.3.rs-3839744/v1.

COMPUTER OLYMPIAD 2024

International Computer Games Association

Santorini: Gold Medal

- Breakthrough: Silver Medal
- o Connect6: Gold Medal
- Dots and Boxes (5x5): Gold Medal
- International Draughts: Gold Medal
- o Outer-Open Gomoku: Gold Medal

RESEARCH INTERESTS

- · Reinforcement Learning and Planning
- Model-based Reinforcement Learning (e.g., MuZero)
- · Algorithm Design and Optimization
- Bioinformatics

TECHNICAL SKILLS

- Programming Languages: Python, C/C++, Arduino, HTML, CSS, JavaScript, Google Apps Script, R
- Operating Systems & Scripting: UNIX-like Operating Systems, Bash Scripting, Arduino Project Implementation
- Biomedical Informatics: Biomedical Data Analysis
- · Algorithms: Reinforcement Learning, Dynamic Programming, Graph Theory, Computer Vision
- Frameworks and Libraries: PyTorch, TensorFlow, OpenAI Gym
- Tools: Git, LaTeX, Docker

PERSONAL PROJECTS

• LinearCDSFold

Jan 2022 - Apr 2023

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Aug 2024

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Tools: C++.

- A tool to design protein-coding sequences (CDSs) by maximizing CAI and the structure stability of sequences in linear time by dynamic programming algorithm.
- Link: http://genome.cs.nthu.edu.tw/LinearCDSfold/

• Multi-CSAR Aug 2021 - Apr 2022

Tools: PHP, HTML, JavaScript, CSS, and Python.

• A web server for scaffolding contigs using multiple reference genomes.

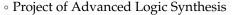
Link: http://genome.cs.nthu.edu.tw/Multi-CSAR/

• A Two-stage Algorithm for Technology Mapping in FPGA Design

Apr 2021 - June 2021

Tools: C++, LEDA library, and ABC tool.

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 Implemented an algorithm composed of minimum level two-input decomposition step and delay optimal FPGA technology mapping with K-input LUTs.

• FP Growth Algorithm for Frequent Pattern Generation

Apr 2021 - July 2021

Tools: C++.

• Project of Data Science

• Implemented FP growth algorithm and FP tree construction.

• Bluetooth-control Spherical Robot with Temperature and Moisture Sensors

2022

Tools: Arduino Uno board, L298N, HC05, ATH10, and DC motors.

• It can roll into a layer house and monitor the temperature and the moisture.

Remote Wi-Fi platform controlling the micro environment for caring plants and hamsters

2021

Tools: ESP8266, relays, DC fans, lights, wires, and other materials for the customized hamsters cages.

- The project contains a Wi-Fi platform which can remotely control the equipment looking after the plants.
- It has multiple connected large customized clear acrylic cages with electric-control fans system.

TEACHING EXPERIENCE

Computer Science Department, National Tsing Hua University

Feb 2022 - July 2022

Teaching Assistant in Algorithms

Hsinchu, Taiwan

- Graded and provided feedback on students' algorithm assignments.
- Designed algorithm-focused programming assignments.

EXTRACURRICULAR ACTIVITIES

President, Art Club in National Taiwan University

- Procured art supplies and managed the club's budget effectively.
- Taught drawing techniques and guided members in improving their artistic skills.
- Designed and organized workshops and lessons to engage and educate club members.

INTERESTS

- Painting: Sketching, Watercolor, Oil painting, and Digital illustration
- Scuba-diving: Enriched Air Diver License, Advanced Open Water License