Yan-Ru Ju

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Institute of Information Science, Academia Sinica, Taiwan

Education

- **National Tsing Hua University** *Feb 2021 - Aug 2023*
  M.S. in Computer Science (Institute of Information Systems and Applications) Hsinchu, Taiwan
- **National Taiwan University** *Sept 2020 - Feb 2021*
  Graduate Coursework in Electrical Engineering and Computer Science Taipei, Taiwan
- **National Taiwan University** *Sept 2014 - Feb 2019*
  Bachelor of Science, Department of Life Science Taipei, Taiwan

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*
  Research Assistant 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

[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.

Awards

- **COMPUTER OLYMPIAD 2024** *Aug 2024*
  International Computer Games Association [🌐]
  - Santorini: Gold Medal
  - Breakthrough: Silver Medal
  - Connect6: Gold Medal
  - Dots and Boxes (5x5): Gold Medal
  - International Draughts: Gold Medal
  - 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*
  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. [🐙]
  - Project of Advanced Logic Synthesis
  - 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