ZEHUA JIANG

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EDUCATION

New York University — Brooklyn, New York
PhD student in Computer Science and Engineering — *09/2022 - 05/2027(Expected)*
Advisor: Dr. Julian Togelius, Dr. Nasir Memon

New York University — Brooklyn, New York
Master of Science in Electrical Engineering — *01/2021 - 08/2022*

Sun Yat-Sen University — Guangzhou, China
Bachelor of Science in Opto-electronics Information Science and Engineering, School of Physics — *09/2016 - 06/2020*

University of California, Berkeley — Berkeley, California
Berkeley International Study Program — *01/2019 - 05/2019*

SELECTED PUBLICATIONS

Conference Paper

- **Jiang, Z.**, Earle, S., Green, M., & Togelius, J. (2022, September). Learning Controllable 3D Level Generators. In Proceedings of the 17th International Conference on the Foundations of Digital Games (pp. 1-9).
- Charity, M., Memon, N., **Jiang, Z.**, Sen, A., & Togelius, J. (2022, September). Diversity and Novelty MasterPrints: Generating Multiple DeepMasterPrints for Increased User Coverage. In 2022 International Conference of the Biometrics Special Interest Group (BIOSIG) (pp. 1-4). IEEE.
- Siper, M., Earle, S., **Jiang, Z.**, Khalifa, A., & Togelius, J. (2023). Controllable Path of Destruction. arXiv preprint arXiv:2305.18553.
- Banerjee, S., Jain, A., **Jiang, Z.**, Memon, N., Togelius, J., & Ross, A. (2024, January). Alpha-Wolves and Alpha-Mammals: Exploring Dictionary Attacks on Iris Recognition Systems. In Proceedings of the Winter Conference on Applications of Computer Vision (WACV) Workshops (pp. 1072-1081). IEEE.

Invited Talk

- "Controllable Content Generators via Reinforcement Learning", Tutorial Speaker, IEEE Conference on Games (IEEE CoG) 2023

SELECTED RESEARCH EXPERIENCES

Learning Controllable 3D Level Generators, NYU Tandon — Brooklyn, New York
Research Intern — *01/2022 - 04/2022*

- Used reinforcement learning algorithms and evolutionary algorithms to solve Procedural Content Generation(PCG) problems that generate diverse, playable game maps, and expanded the previous work from 2-dimensional to 3-dimensional;
- Implemented reinforcement learning agent using proximal policy optimization algorithm with different agent action representations, compared different policy network structures including feedforward models, skip-connection models, etc;
- Implemented Quality-Diversity algorithms such as MAP-Elites, CMA-ME for evolving Neural Cellular Automata(NCA) models;
- Generated playable maze/dungeon in Minecraft with diameter of over 35 in a $7 \times 7 \times 7$ maze.

Realistic Controllable Human Iris Image Generation, NYU Tandon — Brooklyn, New York
PhD student — *09/2022 - present*

- Conducted in-depth analysis of existing iris recognition systems to identify potential flaws at the template level;
- Developed a method for generating synthetic iriscodes capable of bypassing identity checks, simulating multiple user identities, using only bitwise operations (AND, OR, XOR);
- Used StyleGAN2 and 3 for generating realistic, unconditional iris images at the presentation level;
- Conducted detailed biometric evaluations, ensuring generated iris identities were distinct from existing datasets and aligned with the distribution of real iris images.

WORK EXPERIENCES

Geek+ — Beijing, China
Algorithm Intern — *07/2020 - 01/2021*

- Abstracted the dynamic model from the logic of autonomous mobile robots (AMR) warehouse to a simulation platform, defined the state, action and transition space of the environment;
- Proposed a multi-robot dynamic task assignment algorithm according to the prediction of the robots' arrival time. The total idle time of the workstations was reduced by 27.78% on average compared to the baseline algorithm of greedy strategy;

ORGANIZATIONAL EXPERIENCES

- ***Co-organizer*** of Special Session on Games, IEEE World Congress on Computational Intelligence 2024 (IEEE WCCI 2024)
- ***Member*** of student organizing committee of the $6th$ IEEE International Conference on Universal Village (IEEE UV2022)

TECHNICAL STRENGTHS

Programming Language	Python, Shell, html, C, Matlab, SQLite
ML/AI	Pytorch, Jax, TensorFlow, Keras, Gym(Gymnasium), Hugging Face
Other tools	git, slurm, Vim, LaTeX, Blender, Unity