Julian Paquerot

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Experience

SNU Vision & Learning Lab — Seoul, South Korea

Researcher — *November 2022 – June 2024*

- Conducted reinforcement learning with human feedback experiments to enhance quality and alignment of unsupervised skill discovery in two embodied environments (iTHOR, Crafter). Fully implemented a graphical skill extraction model in JAX/Flax, achieving a 2–4x increase in training speed. Facilitated lab-wide adoption of the JAX framework by introducing and supporting other researchers in its application, achieving $\tilde{2}5\%$ adoption within a year.
- Led the design and development of an embodied RL environment based on AI2THOR Deployed Docker containers to run Unity-based simulations on a headless cluster, enabling efficient training of RL agents. Optimized task evaluation algorithms, reducing overhead to 1.7% of the raw AI2THOR simulation runtime. Designed 14 complex RL tasks, demonstrating 80% relative improvement in task completion with a predicate-based reward signal. Paper currently under review for ICRA 2025.

Apex Solutions — Figeac, France

Research internship — *June 2022 – August 2022*

- Initiated the development of a multi-agent environment to simulate intrusion scenarios in critical infrastructure (Python, Gym/Gymnasium). Delivered a base environment still actively used in subsequent research projects.
- Designed and implemented reinforcement learning (RL) benchmarks for multi-agent capture-the-flag simulations with limited information-sharing constraints (PyTorch, Stable-Baselines3). Adapted RL algorithms for red team (penetration) and blue team (defense) agents to optimize performance in multi-agent scenarios.

Education

Seoul National University, College of Engineering | **South Korea** — *September 2022 – July 2024*

Master of Computer Science and Engineering (Double Degree)

- **Relevant Courses:** Machine Learning (ML), Natural Language Processing (NLP), Probabilistic Graphical Model, Advanced Computer Architecture.
- **Teacher Assistant Work**:
  - **Probabilistic Graphical Model (Graduate):** Designed and graded one midterm exam and regular quizzes for a class of $\tilde{4}0$ students.
  - **Discrete Math (Undergraduate):** Designed, administered, and graded a 2-hour final exam and two major homework assignments for $\tilde{1}50$ students.

École Nationale Supérieure des Mines de Saint-Étienne| **France** — *September 2020– September 2024*

Master of Data Science; Diplôme d'Ingénieur Civil des Mines (ICM).

- **Relevant Courses:** Probability & Statistics, Statistical learning, Machine learning, Metamodeling and Optimization, Artificial Intelligence, Image Processing, Networks, Experimental methods.
- **Community Engagement:**
  - **President, Arts Council (Bureau des Arts):** Directed cultural programming and events, organizing three monthly events, including the school's annual gala with over 100 individual artists. Expanded arts engagement through regular music, dance, and theater classes, doubling participant numbers over one year.
  - **Sports Coordinator, Cartel des Mines 2022:** Directed the logistical and athletic planning of a 4-day, multi-sport competition with over 2,000+ participants from top French engineering schools, and $163,000 budget with high participant satisfaction.

Projects

RL-THOR | *GitHub*

- Fully implemented RL environment using AI2THOR household scenes simulator (Python, Gymnasium). Enables researchers to customize the environment and define complex tasks based on properties and relations of object within the scene. Provides 30+ predefined tasks of varying diffuculty level.

MusicBrainz2Notion Sync | *GitHub*

- CLI application to synchronize music metadata between MusicBrainz and Notion.

Early Stage: Infinity Engine-inspired 2D isometric RPG game engine in Godot (GDScript).

Language and Interests

Languages Proficiency: Fluent in English, native in French, intermediate in German and Korean

Interests: Dance (social, dancesport, contemporary), sport climbing, writing and staging productions