

UNIVERSITY OF PISA
MASTER DEGREE IN COMPUTER SCIENCE
ARTIFICIAL INTELLIGENCE FUNDAMENTALS



AIF PROJECT IDEAS: COMPETITIONS

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OVERVIEW

Why Competitions?

How Competitions Work

What We Expect

Competitions 

WHY?



WHY?

- It is a great opportunity to challenge yourselves and compare with other students around the world. Get your hands dirty with practical applications and creative problem solving.
- All the competitions are well established – multiple editions - and provide a solid codebase to start, moreover, past years submissions are often available.
- Participating in these competitions will expose you to a wide range of AI techniques, tools, and frameworks expanding your skillset and portfolio.
- You get to see your agent in action and actually playing the game – probably more interesting and easier than Nethack.

HOW COMPETITIONS WORK



- All the competitions we present have been proposed and run for several editions at the competition track at [Conference on Games \(CoG\)](#).
- We will refer at the 2024 editions ([link here](#)), there is a high chance the competitions will be repeated next year.
- Competitions will be officially announced around January/February 2025, the deadline is usually 1 month before the conference, i.e., July 2025.
- Last year competitions had on average 10 submissions – high chance of winning! – and there was a prize pool of 1000\$ split among top 3.

WHAT WE EXPECT

- We **expect** a single notebook, exported as pdf, with link to Github repository for the project.
- We **expect** you propose a submission to the competition of your choice and compare the performance of you agent with the provided baselines from current and past editions.
- We **do not expect** to propose the best solution – also this year in some competitions the submissions did not defeat previous years baselines – obviously, it is a plus.
- We **expect** you to develop a novel solution based on the methods presented during the lectures, that should be thoroughly analyzed in the report, showcasing you understood the concepts and are able to implement AI solutions.

EXTRA AND QUESTIONS

- The 2024 competitions will remain [fixed for all the exam sessions](#).
- If you are interested in participating to the 2025 competitions – released Jan/Feb 2025, the following applies:
 - Take the exam with the presented methodologies, independently from the session.
 - We will provide support additional support to apply to future competitions (please let us know via email).
- Well developed projects with competitive results may be chosen to be presented as publication to next year conference.

QUESTIONS



POKÉMON BATTLES

- This competitions present two possible tracks:
 - *Battle Track*: this track focused only on the battling aspect of Pokémon. The proposed battle agent must be able to play with any given team against any challenging team.
 - *Championship Track*: this track focuses on team-building skills in the presence of an ever-evolving meta-game. Battle agents must be able to adapt as quickly as possible to the meta by choosing the best teams to compete against the teams they believe they will be facing.
- Useful links:
 - [Published Paper](#)
 - [Code repository](#) (Python)
 - [Homepage](#)

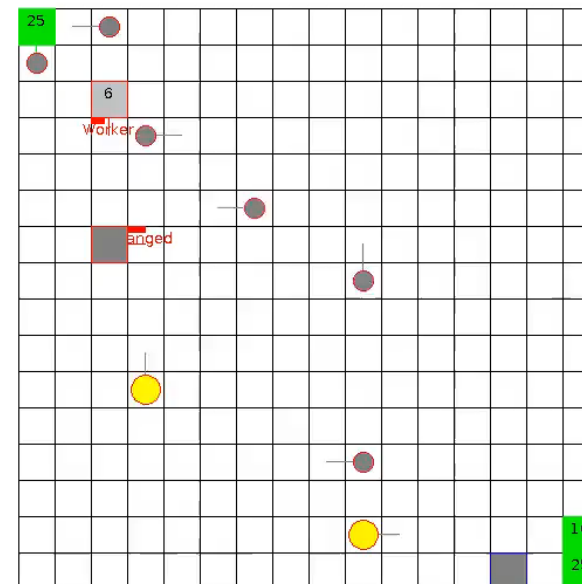


MICRO RTS

- microRTS is a small implementation of an RTS game, designed to perform AI research. The advantage of using microRTS with respect to using a full-fledged game like Starcraft.
- Agents are evaluated against different baselines on several maps, some are available some hidden, in a round robin tournament. Bot from previous editions are open-source you can find the links on the website.



- Useful links:
 - [Homepage](#)
 - [MicroRTS Wiki](#)
 - [Code repository](#) (Java & Python)
 - [Published Paper](#)



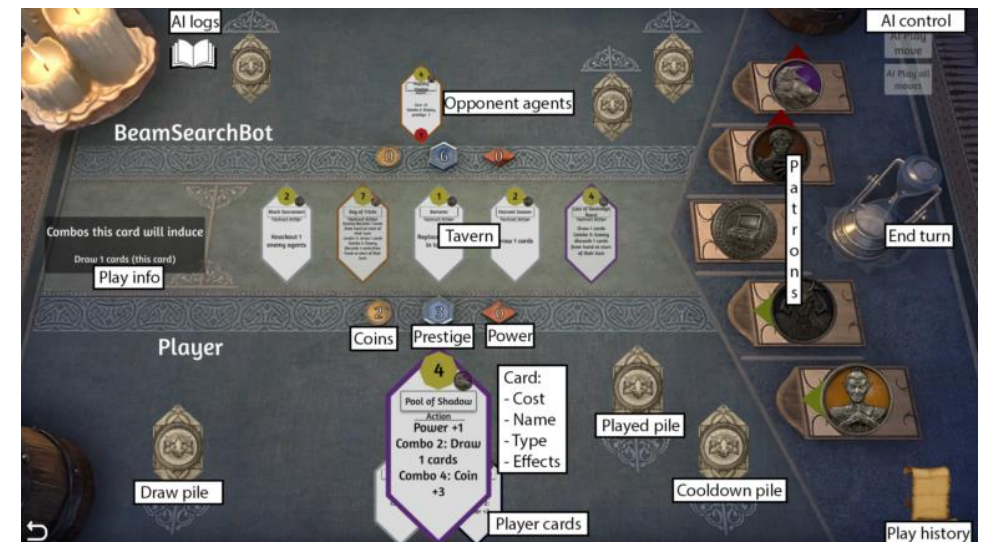
DARE FIGHTING ICE

- DareFightingICE is a 1v1 fighting game. Past editions are focused on developing an agent that fights based on sound input data. Video and stats (HP, time, damage etc.) are anyway available and can be used to create your agent.
- The competitions is mostly related to Reinforcement Learning agents, but you can adapt it to your favorite AI method. The game comes with a bot agent.
- Useful links:
 - [Homepage](#)
 - [Code repository](#) (Python and Java)



TALES OF TRIBUTE

- The deckbuilding card game Tales of Tribute is a special activity added to the massively popular multiplayer online role-playing video game The Elder Scrolls Online.
- The competition will be run using ScriptsOfTribute, an open reimplement of the original game in the .Net framework. It features the game manager that allows running AI agents implemented as C# classes (adapters for other languages are possible) against each other and a graphical user interface that support human vs. AI games.
- The competition uses global winrate in all vs. all tournament, conducted on many mirror matches using the same seeds, past submissions are available.
- Useful links:
 - [Homepage](#) (C# mostly)
 - [Published Paper](#)



CONCLUSIONS

- All the competitions' winning agents are all based on symbolic methods like rule based or search based e.g. MCTS. They highly synergize with the topics of the course!
- All the repositories provide instructions for install, hopefully removing all issues we encountered last year with the installation process.

For any question about the projects and competition you can contact me via email: elia.piccoli@phd.unipi.it

QUESTIONS