

Super Mario Bros. is still actively used as a model game for research in level generation. Every year, the most recent techniques are applied and tested. This lately includes various deep learning and reinforcement learning methods. Many of the level generators use an artificial agent to test levels' playability or to gather playthrough metrics. Therefore, the performance of the level generators is undeniably tied to the performance of the artificial agent used, both in level validation and the computing time needed.

In our previous work, we created a new state-of-the-art agent for Super Mario Bros. as a proof of concept when we implemented a more efficient forward model (world simulation) for the Mario AI framework. In this work, we continue in that work and focus on optimising how the agents explore the game tree by devising domain-specific heuristics and running extensive parameter searches to tune the agents as much as possible.

Thanks to these improvements, a new state-of-the-art agent was created. This new agent should be capable of beating every standard Super Mario Bros. level and it requires less time to solve levels than previous agents. We also present a proof of concept agent that is capable of solving maze-like levels, which is something none of the previous agents was capable of.