

## Project Proposal

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For the course project, the problem I will be investigating is training a deep reinforcement learning model capable of playing Mario Kart 64. The project is inspired by the “[Playing Atari with Deep Reinforcement Learning](#)” paper. I believe this problem is interesting as using reinforced learning to play games is a growing topic that can help boost game development.

There are several resources I will be using to provide context and background. I will research existing implementations of deep reinforced learning in games, such as the playing Atari with deep reinforced learning paper mentioned above. Also there is an existing paper “[NeuralKart: A Real-Time Mario Kart 64](#)” that uses CNN to play Mario Kart 64 and I will see how I can improve from their performance using deep learning.

For obtaining data, I will most likely use [OpenAI's Gym](#) environment and find an existing wrapper for a N64 emulator. Then, I can use this environment to automate obtaining relevant data and simulating games.

Many of the implementations for playing Mario Kart using AI involve imitation learning, such as the NeuralKart paper mentioned above. My implementation is different as I will be using reinforced learning. Whilst I currently don't have an exact answer for what exactly my method will be, I will most likely follow some form of reinforced learning algorithm like Deep Q-Learning.

I will evaluate my results based on whether the model finishes various tracks and if it does, how fast it completes it. If the model can successfully complete tracks, the results can then be compared to human controlled time and also results from other similar papers (such as the NeuralKart paper mentioned above).