Creating an Autonomous Path Navigator To Generate Interest in Machine Learning Among Children

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The development of visual models using machine learning is fundamental in furthering interest in artificial intelligence. An autonomous path navigator model utilizing methods that could be used in creating autonomous rovers was developed to help children understand the principles of machine learning. A machine learning model was created using the game engine Unity and the ML-Agents plugin. This model simulates an agent represented as a cube avoiding obstacles while trying to reach a designated target, similar to how a rover navigates around obstacles to reach its destination. Reinforcement learning and curriculum learning, forms of machine learning, were used to train the agent. The agent was trained in a scenario that took 5,980,000 steps over the course of 24.39 hours. At the end of the training, the mean reward over each 20,000-step interval ranged between 0.508 and 0.667, meaning that the agent reached the target between 75.40% and 83.35% of the episodes. When placing the trained policy back into the simulation for an hour, the agent was able to reach the target 163 times out of 190 episodes, correlating to an 85.79% accuracy rate. As a result of the data collected, this model can be used in demonstrations to introduce machine learning to children from a young age.

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