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Project 3: Reinforcement Learning in Unity

This document contains a summary of each scene, as well as a description of the three trained "Brains" that are included in the project.

Scenes:

1. **RollerBall**

* Sphere is Agent, Box is Target.
* NN was trained for 180,000 steps to reliably avoid edges and collide with the box on the default plane size.
* The project comes with this brain (RollerBall) installed.

1. **RollerBox**

* Box is Agent, Sphere is Target.
* NN was trained for 190,000 steps with this configuration.
* Force Multiplier has been doubled to 20 to account for increased resistance to movement, as the Box is more difficult to move than the Sphere.
* The two iterations on this (RollerBox and RollerBox1) showed some initial promise, but the RollerBall model still produced more reliable results in testing, especially when the Agent was very close to the Target, a situation that caused the Box-trained NN to "stall out".
* Sphere has ability to move from user controls.

1. **Obstacles**

* Same as RollerBox, but with added obstacles. This is the final "game" scene in the project.
* Includes 8 cylinders that the box and player have to tumble around.
* Includes 4 ramps on each edge that allow the player to "ramp" off the platform and have a chance of landing back on if they are skilled enough. Since the NN was trained on a totally flat platform, it does not intentionally take advantage of this.

Below is a screenshot of the TensorBoard metrics for each of the 3 NN's:



