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12SEP2019

MV4025 Final Project Write Up

**Early Stages**:

We started off by running several iterations of the starter code. As expected, the results were poor, yielding a running avg reward of 0.0189.

Our baseline settings were as follows:

Run time/training duration = 48000

Discount factor = .99

Hidden layer type = tanh

Test duration = 100

Learning rate = .05

Reward timeout = 20

Seed = 557935545

Num hidden layers = 80

Respawn with = 15

Loss factor = .2

**Approach**:

We noticed that the only reward function was passing rewards based solely on the entity’s distance to target. We modified the RewardDistToTarget method to incorporate other methods of rewards like the kills minus losses and also a reward for distance from a friendly entity. We set up our code in such a way that the kills-loses factor was more effective than the distance from a friendly entity.

@ Thomas put screen shot here.

Our thinking behind the incorporation of these two reward factors was to provide a method of measuring our status of “winning”. A higher number of kills correlates to a closer status to winning. The concept of rewarding entities for fighting closely to other friendlies was based on the idea that two entities attacking an enemy together would be more efficient and effective than one. While this may not be doctrinally sound, it is our belief that studying this metric will hopefully shed some light on better approaches.

While being close to each other is not guaranteed to increase effectiveness nor is it something that always makes sense tactically, the fact that the terrain is not varied in this simulation (it is actually flat in this case) should yield positive results.

Current Run Params:

Run time/training duration = 48000

Discount factor = .99

Hidden layer type = relu

Test duration = 100

Learning rate = .05

Reward timeout = 20

Seed = 557935545

Num hidden layers = 80

Respawn with = 15

Loss factor = 1.1