Applied Machine Learning in HOVENSTAR

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HOVENSTAR is an interstellar tactical role-playing game about resolving time travel crimes.

Reinforcement Learning Development Pipeline

AI Bot Scenario

- Build a 2 Team AI Bot scene
- Train by PPO

Environment

- Add tiles of mountain, water, etc.
- different type of tiles have different buff or debuff features

Evaluate

Setup Environment

Multi AI Brains

- Two Regiments have different goals
-Trained by separate AI brains

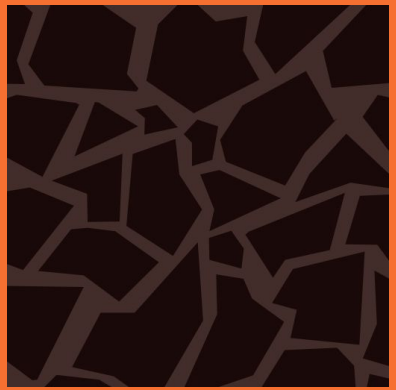
Play as a team

- Explore whether one regiment could make team decisions

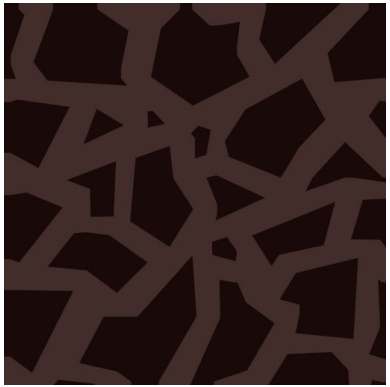
Dataset Used for Tile Generation

- Dataset of 500 images split into 10 classes: Brick, City, Desert, Forest, Lava, Snow, Space, Stone, Water, Wood
- Used Image Augmentation to increase this to 50000 images: Rotations, Translations, Blurs, Adding Noise, Erosion, Dilation, Blends, Additions, Multiplications

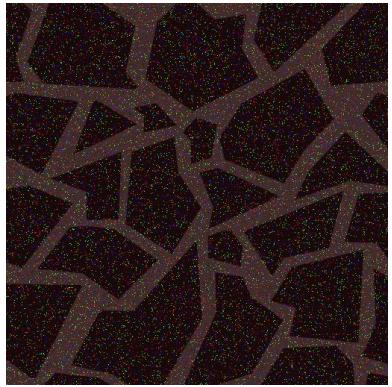
Original



Dilation



Salt and Pepper Noise

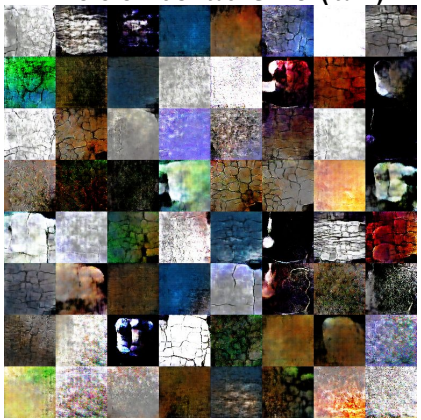


Add

GAN Model Used for Tile Generation

- Neural Network relies on RMSProp optimizer
- Layers of Leaky ReLU and Convolutions in the Discriminator
- Layers of ReLU and transposed Convolutions in the Generator
- Loss function determined through the difference in means of the Discriminator's real images and the Discriminator's classification of fake (Generated) images

24000 iterations (all)



11770 iterations (water)