Introduction
We aim to develop Deep Learning networks (PokemonNet, collectively) to predict various features of Pokemon cards. Specifically, we model predict type, hit points (HP), and card price. We employed three architectures (5 Layer neural net, convolutional neural network, and DenseNet) to accomplish these tasks. Ultimately, we hope to expand the functionality of PokemonNet to create a real-life version of the famed and beloved Pokédex, fulfilling a lifelong dream of many millennials who aspire to become Pokemon Masters.

Dataset and Preprocessing
We scraped our dataset from pmnccards.com and rescaled the card image files to 224x224 pixels. We vectorized the images and concatenated the vectors into a single X matrix. Y labels were also vectorized. We collected all 9791 Pokemon cards in existence and divided them into Train/Dev/Test sets as follows: Train = 7832 cards (~80%), Dev = 979 cards (~10%), Test = 983 cards (~10%).

Architectures

5-layer Neural Net

Convolutional Neural Net

DenseNet-121

Predicting Pokemon Type

Convolutional Neural Net

Network Training

Saliency mapping

5-layer Neural Net

Parameter tuning

Network training

Saliency mapping

Convolutional Neural Net

Network training

Saliency mapping

Predicting Pokemon HP

Convolutional Neural Net

Parameter tuning

Network training

Saliency mapping

Convolutional Neural Net

Parameter tuning

Network training

Saliency mapping

Predicting Card Price

Convolutional Neural Net

Network training

Saliency mapping

DenseNet-121

Network training

References
1. paper1, paper2, paper3
2. paper4, paper5, paper6
3. paper7, paper8, paper9