

Trading Card Authenticator Project Proposal

Group 5

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Problem statement:

Authentication is the process of verifying the originality or genuineness of a trading card. This task involves evaluating and inspecting whether a card is original or fake. A general job description of a card authenticator found in PSA Grader [website](#) is:

“Individual should be detail oriented, have good organization skills, and be able to focus on cards over long periods of time.”

Evidently, there is an authentication industry that seeks people to do detailed oriented and most times repetitive work for longer hours. Machine learning's objective is to replace humans with machines to work on this kind of repetitive and exhaustive jobs. Therefore, our motivation in this project is to train a machine learning model that identifies genuine trading cards.

Dataset:

For this project we focused on one type of trading card, the Pokémon trading cards. The dataset we intend to use can be found in the Kaggle dataset. Plus, we intend to complement this data with more images of other cards to avoid model overfitting. A total of xx cards will be used to train the model.

Deep Neural Network Architecture and Framework:

We intend to use a Convolution Neural Network architecture that classifies images into 3 categories: Original, Fake, Invalid. It will be a standard framework with several convolution and pooling layers and one fully connected layer to generate the desired output classes.

TensorFlow will be the framework to build and train the model architecture. The main reason we select to work on this framework is because it will allow us to generate a model suitable to be deployed in a web application platform.

Reference materials:

We will use TensorFlow documentation to create an ImageDataGenerator with augmentation techniques as needed. Furthermore, we will attempt to implement pre-trained networks such as ResNet50, DenseNet121, VGG16. We will use the documentation of those networks.

For data acquisition, we intend to download the data found in Kaggle datasets: <https://www.kaggle.com/datasets/ongshujian/real-and-fake-pokemon-cards>

Additionally, we will get some experimental ideas based on this project found in GitHub: <https://www.kaggle.com/anuragupadhyay6212/cotton-disease-prediction-using-vgg16-and-relu50>

Finally, the code we received to work on Exam 1 will allow us to design processing, modelling and evaluation steps in the project.

Performance:

Since we are not a group of professional authenticators, our only possible way to evaluate the performance of the model is to calculate classification metrics: F1 score and Accuracy. Additionally, we will test our model by deploying in a web application. We will get random images and calculate the results of the model, and check for generalization performance.

Rough Schedule:

Task	Week 1	Week 2	Week 3	Week 4
Data Acquisition	X			
Model Architecture		X	X	
Model Training and Evaluation		X	X	
Model Deployment				X