

2D Anime Image Detecting with Machine Learning

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Introduction

With the development of GPU and machine learning algorithm, Computer Vision field has huge breakthrough on object detection technology. Image detection, which is currently one of the most popular and classical topics in Computer Vision, is getting more completed. In my project, I will review the former method of image detection based on machine learning with TensorFlow and focus on the detection of 2D anime image. The final goal of this project is to get a model for detecting the elements in 2D anime image. I will use the public dataset on Kaggle named “Safebooru – Anime Image Metadata” to train and test my model.

Motivation

As there are already lots of great models for detecting photographs or videos, I could hardly find any useful models or algorithms for 2D paintings, specifically 2D anime images. I would like to combine the former ideas of detecting real world photographs. I wonder what’s the difference between parameters for real world photographs and 2D anime images. Personally, I am interested in watching animations, so I looks forward to developing this model for further analyzing 2D anime image and making a tiny contribution to anime.

Expected Outcome

In this project, I am focusing on giving a model for detecting 2D anime images. The expected outcome is that all the valid elements (contained in the element dictionary) will be recognized and output on the screen with an input of 2D anime images. The training and testing data are all in “Safebooru – Anime Image Metadata”. When the project is finished, the model should pass the test of testing images in the project dataset. For a random input of 2D anime image from other places (out of other datasets), this model should also work on fine in most cases.

Methodology

This dataset is a raw material from animation website, which has not been modified for machine learning and model training. The first step of my project is to generated a dictionary of tags and download the images on the folder. Then I will build a model based on CNN and other machine learning ideas. The coding part is based on TensorFlow, which is one of the main purposes for this course. After the model is built, the model will be trained and tested by training data and testing data in my dataset. During this period, I will improve my method and change the parameters for a better result. If the time allows, I will put more data into training. Finally, I will get a complete model for detecting 2D anime images. As the dataset is huge for running on personal device, I will use the personal server instead.

Dataset

The dataset of project, named “Safebooru – Anime Image Metadata”, is a public dataset on Kaggle. This data set is provided by Alexander Lamson and updated a year ago. This dataset contains 1.9 million rows

of tag-based anime image metadata. “Safebooru” is a tag-based image archive maintained by anime enthusiasts, which allows users to post images and add tags, annotations, translations and comments. Two significant columns for this project is “sample_url” and “tags”. “sample_url” provide me with the URL of the image. “tags” describes the elements contained in the image, which will be further checked in training and testing period. For this project, 1.9 million rows of image maybe too large for machine learning and model training. Under the circumstances, only 10,000 images will be trained each time and the total training times will be depend on project schedule.