

Object detection and scene recognition for historical story images.

Mariana Abu-Hattoum, Information System Department, University of Haifa
Supervised by Prof. Ilan Shimshoni, Information System Department, University of Haifa
ishimshoni@is.haifa.ac.il

Our ancient history stories, date back long before we were on the verge of inventing cameras, all we had were words to describe it. With time, humans started to embody the stories' main plot in many ways (e.g., drawings, sculptures, mosaics, statues, etc.). As humans, we can recognize a scene by the objects inside it. However, we aren't always capable of recognizing the story behind it. Thus, in this project, our goal is to recognize the story behind the scenes by considering the objects existing in each scene.

Our dataset contains images that are captured from those embodies. For example, the dataset includes pictures of drawings (from churches, history books, etc.) and pictures of sculptures or mosaics (from churches, museums, or any archaeological sites). Such images make our dataset more challenging. Due to the lack of object details and image resolution in our dataset, object detection systems may find it challenging to detect objects.

In this project, we managed to see how object detection handles such datasets. To make it more challenging, we took the object detection results and used them as an input for the MLP classifier, which then detects the historical scene using the objects that exist in each image. The datasets we chose consist almost entirely of the same characters. For example, three of them consist of a woman and a man, two of them consist of a baby, a donkey, and other men around them.

The dataset in this work was collected and tagged manually. Before training, we applied the same augmentation strategy to all datasets. The datasets were trained on a pre-trained model of YOLOv5 [S, M, and L] separately and combined. The output has been processed and fed into the MLP classifier, which uses the detected objects to classify the image.

Index: Object detection, YOLOv5, MLP.