Project Progress Report

25 April 2024

Our project aims to develop a logo identification and blurring application using deep learning techniques. We have made significant progress in dataset preparation, model training, and algorithm development. This progress report outlines the milestones achieved, current activities, and upcoming tasks for the successful completion of our logo identification and blurring project.

Dataset Preparation

We have curated a dataset consisting of approximately 10,000 images representing logos from around 700 brands. This dataset is sourced from the "Logos in the Wild" collection, a reputable repository of diverse logo data. Additionally, we have meticulously cleaned and organized the dataset to ensure quality and consistency. The data has been partitioned into training, validation, and testing subsets to facilitate model training and evaluation.

Model Training

Our current focus is on training our logo detection model using the YOLOv5 object detection algorithm. While YOLOv7 may be explored in the future, we opted to use YOLOv5 as our object detection algorithm due to its efficiency and performance. YOLOv5 offers several pre-trained models with varying complexities to accommodate diverse training requirements.

To adapt YOLOv5 for logo identification, we have customized the algorithm to recognize logos specifically. This entails configuring the model architecture, defining output classes, and optimizing performance for logo detection tasks.

We have tailored our dataset to meet the requirements of YOLOv5, which operates with datasets in YAML format. To facilitate model training with YOLOv5, we formatted our dataset into a YAML file. YOLOv5 requires datasets to be structured in this format, which includes specifying image paths, bounding box coordinates for annotated logos, and corresponding class labels.

The model was trained iteratively using GPUs to expedite training. During training, we monitored key metrics including loss, precision, recall, and F1-score to assess model performance. Validation was conducted at regular intervals to prevent overfitting and ensure generalizability.

Despite our initial training attempts, the achieved accuracy fell short of our expectations. We are currently re-evaluating our training strategy and model architecture to address performance limitations. This involves experimenting with different configurations, adjusting data augmentation techniques, and exploring advanced training methodologies.

Next Steps:

Moving forward, we have the following milestones:

1. Model Refinement: We are re-evaluating and refining the training process to enhance model accuracy and robustness. This involves adjusting hyperparameters, optimizing data augmentation techniques, and leveraging transfer learning strategies.

2. Cross Validation and Testing: Upon achieving satisfactory training accuracy, we will conduct cross-validation to validate model generalization. Subsequently, we will evaluate model performance on the testing dataset to assess real-world applicability.

3. Implementation of Blurring Feature: Post-training and testing, we will implement the blurring functionality to obscure logo regions identified by our model. This will culminate in the completion of our logo identification and blurring application.