IT Carlow - BSc.
Software development

# Automatic Detection of Brand Logos Functional Specification

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# Abstract

Automatic Detection of Brand Logos is a tool identifying brand logos in still and moving images, and calculate how long the logo is visible. This document provides the strong guideline for the project programming.

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# 1  Introduction

Automatic Detection of Brand Logos is a tool identifying brand logos in images and videos, and calculate how long the logo is visible. It can help evaluate marketing campaigns, capture user reviews of the product, counterfeit detection and protect brands' intellectual property, personalize product recommendations, improve search algorithms.

If a brand is sponsoring a sporting event or serves as a sports team supporter. The logo is seen on the uniforms of athletes, judges, coaches, and spectators, and is featured among many other positions on stadium banners. As it can be viewed by in-person audiences as well as millions of internet followers, the company seeks to raise awareness through brand promotion. Automatic Detection of Brand Logos can help assess the effect of this sponsorship activity, to understand how many people are seeing the logo, in what context, what kind of web interaction the posts with the logo are having, and what the overall quality and sound of the brands are.

# 2  System Requirements

Automatic Detection of Brand Logos detects multiple Logos appearing in images and videos, and counts the duration of Logos appearing in videos. The users of this system are brand companies, advertising agencies, and people who want to use this system to study machine learning.

The flowchart of the system is shown as Figure 2-1, high-quality data sets are the foundation of object detection. The quality of data sets determines the accuracy of results. The first step in this project development process is finding the appropriate data set, then training the model. When the users input the images or videos, the system needs to identify multiple logos. The system should shall a timer that calculates how long the logo appears in the video. The system should consider both accuracy and processing time.
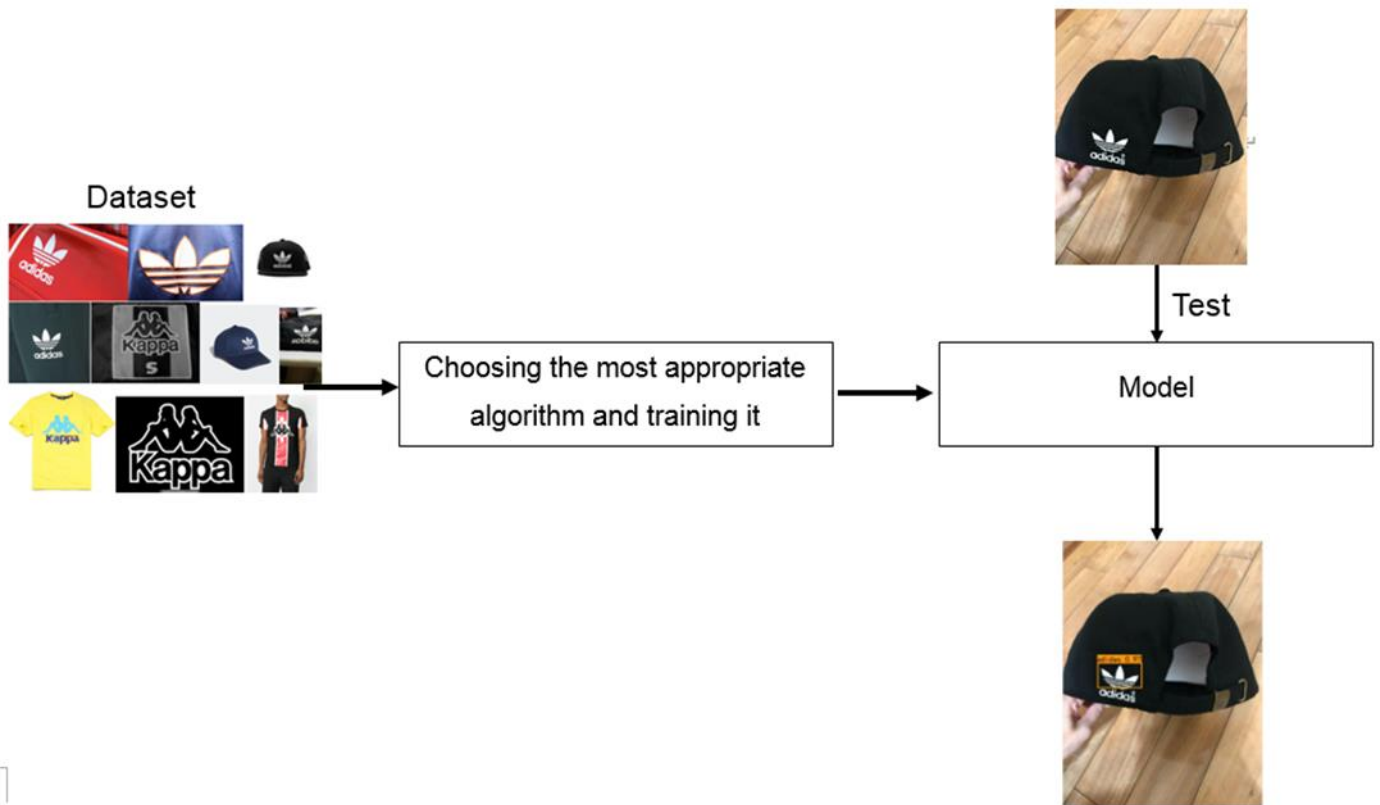
Figure 2-1 Automatic Detection of Brand Logos flowchart

# 3 Use case analysis

## 3.1 System Actor analysis

The users of this system are brand companies, advertising agencies, and people who want to use this system to study machine learning. Users of this system should be able to detect logos in pictures and videos and get the visual duration of logos in videos, and they should also be able to build their own models, train their data sets by using this system.

## 3.2 System use case description

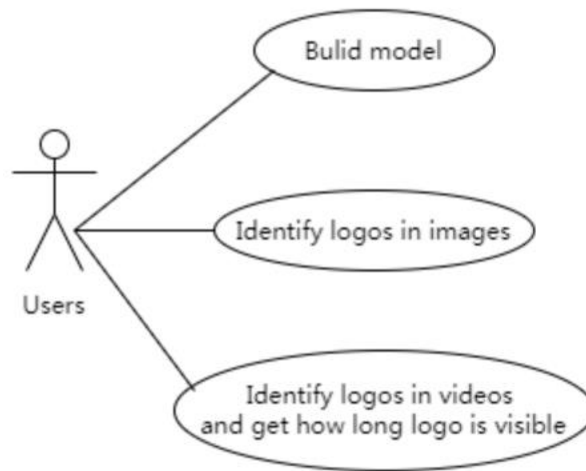The use case diagram is shown in Figure 3-1.

Figure 3-1 Use case diagram

(1) Build model

Users build their own model. The use case description is shown in Table 3-1.

Table 3-1 Build model use case description

| Use case name | Build model |
| --- | --- |
| Use case description | Retraining model |
| Actors | Users who want to train their own model |
| Preconditions | Have the dataset |
| Postconditions | Get the new model |
| Basic event flow | Training the model |
| Alternative flows | OutOfMemoryError |

(2) Identify logos in images

Getting the category of the logos in the still images, and the use case description is shown in Table 3-2.

Table 3-2 Identifying logos in images use case description

| Use case name | Identify logos in images |
|---|---|
| Use case description | Getting the category of the logos in still images |
| Actors | All the users who want to detect logos in images |
| Preconditions | Getting the trained model |
| Postconditions | Getting the category of the logo with confidence |
| Basic event flow | 1. Users input the images to the system |
| | 2. Getting the category of the logo with confidence |
| Alternative flows | Incorrect image path. Input failed |

(3) Identify logos in videos and get how long logo is visible

The users should be able to identify the logos in the videos and the visible duration of logo, the use case description is shown in Table 3-2.

Table 3-3 Identifying logos in images use case description

| Use case name | Identify logos in videos and get how long logo is visible |
|---|---|
| Use case description | Getting the category and the visible duration of logos in still videos |
| Actors | All the users who want to detect logos in videos |
| Preconditions | Getting the trained model |
| Postconditions | Getting the category of the logo with confidence and visible duration |
| Basic event flow | 1. Users input the videos to the system |
| | 2. Getting the category of the logo with confidence and visible duration |
| Alternative flows | Incorrect video path. Input failed |