

Netwatch Object Recognition

Functional Specification

by

Benjamin Tremblay

Institute of Technology Carlow

Dr. Oisín Cawley

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Introduction

This final year project proposed by Netwatch, a company within the security monitoring industry, aims to create an application that will demonstrate state-of-the-art object detection models on humans and vehicles. Additionally, an analysis of the frameworks used to create the object detection models is requested. The deliverables of this project are primarily intended to be demonstrative and educational.

This document will begin by describing the current functional specifications that are part of the project. The following sections will cover the target audience, the metrics as to how the success of this project will be gauged, and will finish by providing system diagrams and use cases for the project.

Functionalities

Primary Functionalities

Static Human Detection

The object detection model deployed within the system must be capable of detecting humans from static input images.

Static Vehicle Detection

The object detection model deployed within the system must be capable of detecting humans from static input images.

GUI Integration for Models

The system must have a functional graphical user interface that will serve as a tool for the visualisation and analysis of the model's performance.

Secondary Functionalities

Dynamic Vehicle Detection

The object detection model deployed within the system must be capable of detecting moving vehicles from three captured frames, each at a 500 millisecond interval from each other.

Multiple Model Compatibility

Multiple state-of-the-art object detection models must be available within the deployed system.

Target Audience

The specific target audience for this application is mostly the security monitoring company that has proposed the project itself, but also any person or organisation that is considering integrating computer vision into their systems. This system is meant to demonstrate the capabilities and performances of state-of-the-art object detection models

A broad targeted audience would be anyone who is new to the computer vision field.

Context Diagram

Object Recognition System Context Diagram

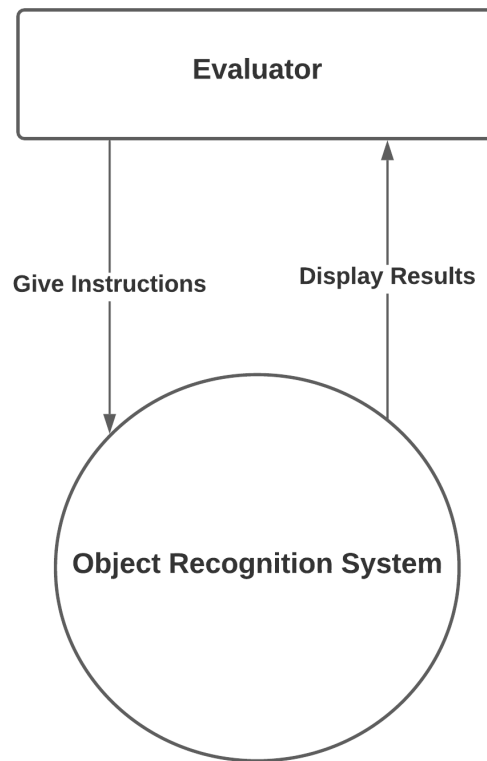


Figure 1 (Tremblay 2021)

Use Case Diagram

Object Recognition System Use Case Diagram

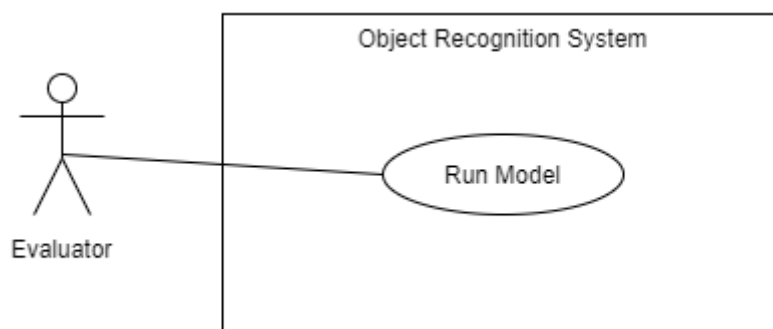


Figure 2 (Tremblay 2021)

Use Cases

Use Case UC1: Run Model

Primary Actor: User

Stakeholders and Interests:

- User: Wants the system to display the model's result for the input data.

Preconditions:

- At least one model is available.
- At least one input image available.

Success Guarantee: System displays the results of the model used on the selected input data.

Main Success Scenario:

1. Evaluator opens the application.
2. Evaluator selects one or more test images.
3. Evaluator selects the object detection model to run.
4. Evaluator runs the model.