**Software Requirements Specification**

**for**

**Object Detection System**

**Version 1.0 approved**

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**Revision History**

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

# **1.Introduction**

## **1.1Purpose**

*The purpose of this document is to give a detailed description of the requirements for the first*

*version of the Object Detection System. It will illustrate the purpose and*

*complete declaration for the development of system. It will also explain system constraints,*

*interface and interactions with other external applications.*

## **1.2Document Conventions**

*This document follows MLA Format. Bold-faced text has been used to emphasize section and*

*sub-section headings. The remainder of the document will be written using the standard font,*

*New Times Roman.*

## **1.3Intended Audience and Reading Suggestions**

*This document will be helpful to*

*1. Users who will understand the capabilities of the software*

*2. Developers can easily understand where their efforts should be targeted to improve or*

*add more features*

## **1.4Product Scope**

*Object Detection can be used in numerous applications. It can be used in simple traffic analysis. It is intensively used in self driving car. It also gives an insight on how humans recognize objects. It can be used in Security cameras to monitor all activities.*

## **1.5References**

*1. https://github.com/tensorflow/models/tree/master/research/object\_detection*

*2. https://tryolabs.com/blog/2017/08/30/object-detection-an-overview-in-the-age-of-deep-learning/*

# **2.Overall Description**

## **2.1Product Perspective**

*The object detection software is a new self-contained software product that is used*

*for recognizing various objects belonging to different classes like phone, television, humans,etc.*

*A total of 100 objects can be detected.*

## **2.2Product Functions**

*The major functions of the product are:*

*- Accepts picture or takes live capture of the surrounding*

*- Performs possible area detection*

*- Recognition/classification of objects using deep learning algorithms*

*The major functions the user can perform are:*

*-Upload a picture*

*-Take a live capture of the surrounding with the help of the software*

## **2.3User Classes and Characteristics**

*There are two type of users.*

*1. Personal users who want to detect objects for fun.*

*2. Businesses who want to detect and monitor the surrounding for various applications.*

## **2.4Operating Environment**

*This product is built for Linux operating system with i5 or higher processor,2.0 megapixel*

*webcam, 4GB of RAM, Opencv 2.4.9 or later, Tkinter, Tensorflow or Keras. These are the*

*minimum requirements.*

## **2.5Design and Implementation Constraints**

*This system is developed in Python with the help of OpenCV library for image processing*

*and Tensorflow and Keras libraries for deep learning. Tkinter is used for developing for the*

*GUI.*

## **2.6User Documentation**

*On-line quick start guide – HTML Webpage*

*User manual – Portable Document Format*

## **2.7Assumptions and Dependencies**

*The Object Detection software has the following dependencies:*

*Python*

*OpenCV*

*Tkinter/PyQt(for GUI)*

*Tensorflow / Keras*

# **3.External Interface Requirements**

## **3.1User Interfaces**

*The GUI gives two options*

*1. Recognize Objects from image*

*2. Recognize Objects from live webcam feed*

*The user interfaces will feature two buttons where each one will lead to either one of the*

*above functions.*

## **3.2Hardware Interfaces**

*The laptop's webcam or an external webcam is used to gather live video feed or an image*

*from which we can process and detect objects in the picture. The mouse or track pad is*

*used to select the options from the GUI menu.*

## **3.3Software Interfaces**

*Software used - Python, OpenCV 2.4.9 or later,Tensorflow,Keras,Tkinter*

*Operating system - Linux*

*OpenCV 2.4.9 or later is used to process images or videos. Tkinter is a python library which helps to develop hassle-free GUIs. Tensorflow and Keras are libraries that help to implement deep learning algorithms.*

## **3.4Communications Interfaces**

*There are no communication components in this product.*

# **4.System Features**

## **4.1Live Object Detection**

4.1.1 Description and Priority

*Allows the user to detect objects from a live feed. Priority 9*

4.1.2 Stimulus/Response Sequences

*The image is extracted from the webcam and passed to the neural network and the result is displayed.*

4.1.3 Functional Requirements

REQ-1: Webcam

## **4.2Detecting Objects from images**

4.2.1 Description and Priority

*Allows the user to detect objects from a an uploaded Image.*

4.1.2 Stimulus/Response Sequences

*The user selects an image from a folder and it is passed to the neural network fro recognition and the result is displayed.*

4.1.3 Functional Requirements

REQ-1: *Select button to select the image.*

# **5.Other Nonfunctional Requirements**

## **5.1Performance Requirements**

*Development has not reached this stage yet due to which details have not been mentioned.*

## **5.2Safety Requirements**

*Development has not reached this stage yet due to which details have not been mentioned.*

## **5.3Security Requirements**

*Development has not reached this stage yet due to which details have not been mentioned.*

## **5.4Software Quality Attributes**

*Development has not reached this stage yet due to which details have not been mentioned.*

## **5.5Business Rules**

*Development has not reached this stage yet due to which details have not been mentioned.*

# **6.Other Requirements**

*All the major requirements are mentioned in functional and non-functional requirement's*

*sections.*

**Appendix A: Glossary**

*Image - A picture of an object*

*Live webcam feed - Video of the actions that are happening in real time*

*GUI - Graphical User Interface by which the user interacts with the product*

*Software Requirements Specification - A document that completely describes all of the functions*

*of a proposed system and the constraints under which it must operate. For example, this document.*

**Appendix B: Analysis Models**

Development has not reached this stage yet due to which details have not been mentioned.

**Appendix C: To Be Determined List**

*[1] Communication Interface*

*[2] Performance Requirements*

*[3] Safety Requirements*

*[4] Security Requirements*

*[5] Software Quality Requirements*

*[6] Business Rules*