**REQUIREMENT TEMPLATE**

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# Executive Summary

VECHILE AND PEDESTRIAN DETECTOR.

# Project Scope

THIS SOFTWARE WORKS AS A DRIVER ASSISTANCE SYSTEMS AIMING TO ALERT DRIVERS ABOUT DRIVING ENVIRONMENTS AND POSSIBLE COLLISION WITH OTHER VEHICLE OR PEOPLE.

|  |  |  |
| --- | --- | --- |
| **S. No** | **Activities in Scope** | **Activities Out of Scope** |
| 1 | Auto detection of vehicles and  pedestrians | Poor recognition software |
| 2 | Shows danger around if any | Does not work at night |
| 3 | Can be used in automatic cars. | Might not work properly on high speed |
| 4 | Can be used to keep check on traffic | Excessive skew angle |

## In Scope

## THIS SOFTWARE WORKS EXTREMELY WELL WITH AUTOMATIC EMERGENCY BRAKING SYSTEM WHICH IS DESIGNED TO AUTOMATICALLY ENGAGE THE BRAKES TO REDUCE THE IMPACT OF AN UNAVOIDABLE FRONTAL COLLISION. AS WE TURN ON THE VEHICLE IT COMES INTO POWER AND IT SCANS THE ENVIROMENT, MARKING THE PEDESTRIANS IN GREEN AND OTHER VECHILES IN RED, AND SHOWS IT ON THE SCREEN

## Out of Scope

## THE SOFTWARE DOES NOT PROVIDE PROPER ASSISTANCE FOR VERY FAST-MOVING OBJECTS AND IT ALSO DOES NOT WORK PROPERLY IN PLACES HAVING VERY LOW LIGHT.

## THE SOFTWARE MIGHT NOT WORK PROPERLY IN CROWDED PLACES AS THIS IS JUST THE BASIC MODEL OF ITS KIND.

# Epics [Major Functions]

* FIRST IT CHECKS FOR THE CAMERA TO RUN UNTIL WE COMMAND IT TO STOP.
* IT CAPTURES THE LIVE COLOURED RUNNING IMAGES AND TURN IT INTO BLACK AND WHITE FOR EASY DETECTION.
* THIS SOFTWARE USES THE **PRETRAINED HAAR CASCADE (**it is a machine learning based approach where a cascade function is trained from a lot of positive and negative images.it is then used to detect objects in other images**)** MODEL FOR THE DETECTION.
* WE GET ALL THE COORDINATES, HIGHT AND WIDTH OF THE REGION OF THE VEHICLES AND THE PEDESTRIANS.
* THEN IT SHOW THE VIDEO WITH RECTANGLE BOXES AROUND THE DETECTED VEHICLES AND PEDESTRIANS SIGNNALING DANGER IF ANY.
* THE SOFTWARE KEEPS THE VIDEO FEED ON UNTIL WE COMMAND IT TO SHUT DOWN.

# Requirements

## Functional Requirements

THIS SOFTWARE WORKS MORE OR LESS ON THE PRETRAINED HAARCASCADE MODEL FOR THE DETECTION. THIS IS BASICALLY A MACHINE LEARNING APPROACH WHERE A CASCADE FUNCTION IS TRAINED FROM A LOT OF POSITIVE AND NEGATIVE IMAGES. IT IS THENUSED TO DETECT OBJECTS IN THOSE IMAGES.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement (#)** | **Requirement Specification** | **Department** | **Name of Business User** | **Status** |
| E1FR1 | Real time video capture. |  |  | low |
| E1FR2 | Frame extraction. |  |  | high |
| E1FR3 | Vehicle and pedestrian detection |  |  | high |
| E1FR4 | Image acquisition |  |  | high |
| E1FR5 | Vehicle extraction |  |  | low |
| E1FR6 | Pedestrian extraction |  |  | low |
| E1FR7 | Danger recognition |  |  | low |

## Non-Functional Requirements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Requirement (#)** |  | **Requirement Specification** | **Department** | **Name of Business User** | **Status** |
| NFR1 |  | Security |  |  | High |
| NFR2 |  | Portability |  |  | Moderate |
|  |  | Durability |  |  | Low |
|  |  | Accuracy |  |  | Low |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| E1NFR2 |  | Execution Speed |  |  | Medium |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| E1NFR1 |  | High resolution image capture |  |  | High |
|  |  | Moderate speed. |  |  | Low |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

## Infrastructure Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement (#)** | **Requirement Specification** | **Department** | **Name of Business User / Project Team Member** | **Status** |
| IR1 | Database for positive and negative images |  |  | Ready |
| IR2 | Amazon web service |  |  | Ready |
| IR3 | Haar cascade classifier trainer |  |  | Ready |
| IR4 | Image capturing system |  |  | Ready |
|  |  |  |  |  |

## Requirement definition in Agile

* **Who are we building it for, who the user is? —** AS A CUSTOMER THIS SOFTWARE IS VERY MUCH REQUIRED IN TODAYS VECHILES AS SELF DRIVING CARS IS THE NEW GAME.APART FROM THAT EVEN IN MANAUL VECHILES WE HAVE SEEN A LOT OF ACCIDENTS HAPPENING BECAUSE OF SOME MINOR ISSUES.HENCE THIS WILL ALSO COVER UP FOR THOSE ACCIDENTS.
* **What are we building, what is the intention? —** I WANT THIS SOFTWARE TO BE USED BY THE AUTOMOBILE INDUSTRY TO USE IT FOR THE BETTERMENT OF THE PEOPLE.THE INDIAN AUTOMOBILE INDUSTRY DOES HAVE SUCH FEATURE BUT THEY PRODUCE MINOR ISSUES AND HENCE WE NEED TO RECTIFY THEM. THESE CAN ALSO BE USED BY THE GOVERNMENT IN THE ARMY AND BY THE TRAFFIC POLICE.
* **Why are we building it, what value it brings for the user? —** SO THAT THI SSOFTWARE HELP AND MAKE EASE FOR THE DRIVERS. WITH A SIMPLE VIEW AT THE SCREEN THEY CAN MAKE OUT WHOS NEAR THEIR VECHILE OR CAN BE