DESIGN AND SIMULATION OF SENTINEL GUN ASSISTED BY IMAGEPROCESSING FOR DEFENCE APPLICATION

AJEETH.A(15UMEC103),BARANI DHARAN.K(15UMEC102),THERIMUTHU SELVAM.A(15UMEC050)

Department of Mechanical Engineering, Kamaraj College of Engineering and Technology.
Madurai, Tamilnadu.

ABSTRACT

Every year our Indian soldiers have lost their lives due to sudden terrorist ingress and natural calamities. It should be a great lose to our nation. In order to save the life of our soldier, an autonomous guarding system is to be developed which should save the lives of the soldiers. In this project, a versatile gun holder and automatic aiming sentinel gun is designed with the assistance of image processing technology. Web Camera is used along with the gun holder to capture the live videos. This video is then further analysed for face detection and tracking. Precise coding is made for face detection and tracking algorithms using OpenCV, Spyder software. The output of face detection and tracking of the captured image sequences is then fed to Arduino microcontroller. In Arduino, the face tracking is coupled with the servo motors which directly controls the Gun for tilting, rotation and triggering. Thus, it could fire the enemies automatically when they come into the range of the camera. This work will be useful for our country in Défense Sectors.

INTRODUCTION

This prototype is going to develop for protecting the nation from the foreign terrorist entry through the border by shooting them by a self triggered gun at tached in a multiple gun holder.

OBJECTIVE

- To avoid the soldiers suffering from over hotness and coldness due to winter and summer season.
- To reduce the monitoring work of the soldier from morning to night.
- To shoot an enemy if he cross the border when soldier is not there.
- To reduce the death of border guard soldiers.
- To guard the border 24×7.
- To manage the sudden terrorist ingress.
- To avoid the periodic alteration of soldiers from borders.
- To trigger the gun automatically.

IMAGE PROCESSING

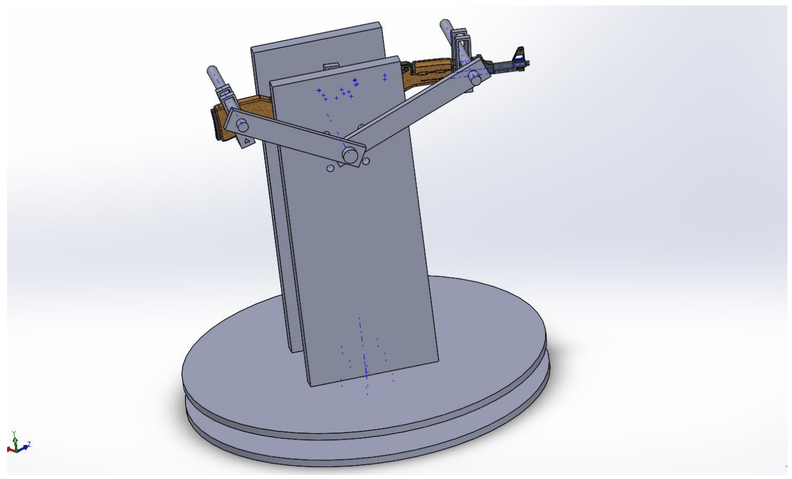
- Image processing is an technique in which the input is an image or a serie s of images or videos, such as photographs or frames of video. The output of image processing can be either an image or a set of characteristics or parameters related to the image.
- It also means "Analyzing and manipulating images with a computer". Image processing is performed this three steps

1. First, import images with an optical devices like a scanner or a camera or directly through digital processing.
2. Second, manipulate or analyze the images in some way. This step can be include image improvement and data summary, or the images are analyze to find rules that aren't seen by the human eyes. For example, meteorologi sts use this processing to analyze satellite photographs.
3. Last, output the result of image processing. The result might be the image changed by some way or it might be a report based on analysis or result of the images.

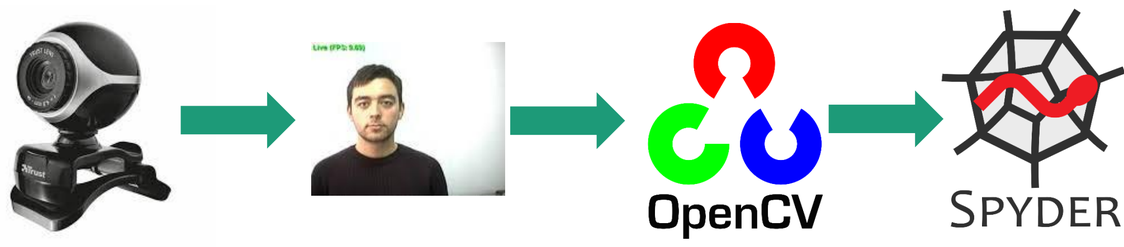
SOFTWARE USED

- Design
  - Solidworks
- Image processing
  - Anaconda
  - Spyder
- Platform
  - Ardunio
  - Opencv

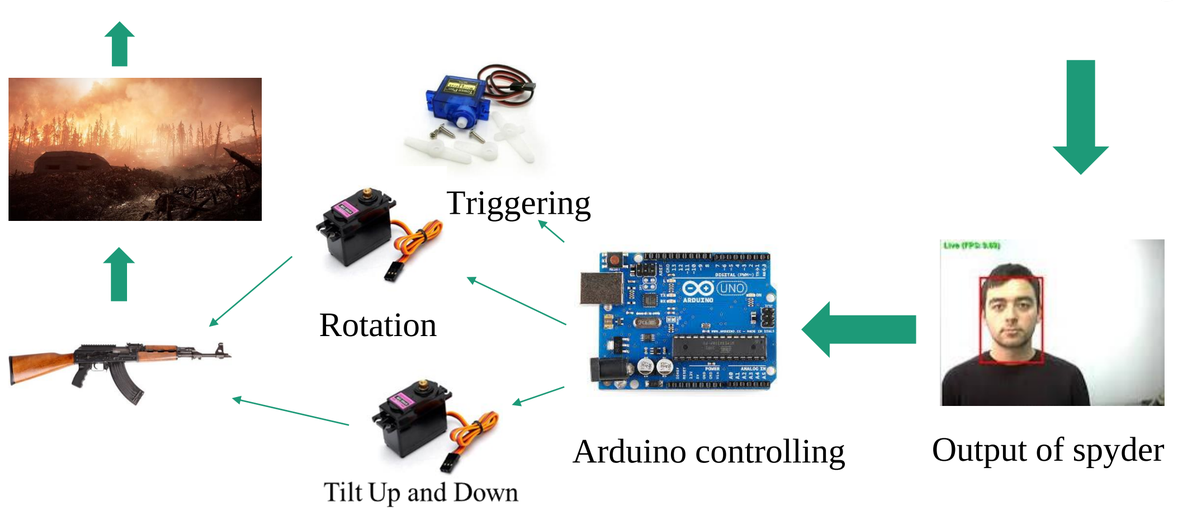
CONCEPTUAL DESIGN



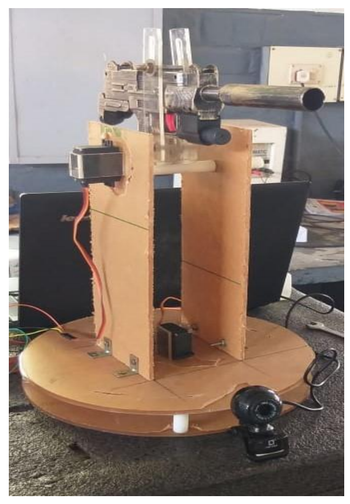
METHODOLOGY



- Input
- Face detection
- Centroid calculation and face tracking



PROTOTYPE MODEL



CONCLUSION

The theme of the work is to design a versatile gun holder and automatic aiming sentinel gun. To achieve this, image processing technology is applied and integrated in the newly designed gun holder. Web Camera is used along with the gun holder to capture the images. It acquires the live videos which should be then further analyzed for face detection and tracking. Precise coding is made for face detection and tracking algorith ms. The captured video from the web camera is fed to spyder software where the coding is compiled in OpenCV platform. It gives the output of face detection and tracking of the captured image sequences and it is th en fed to Arduino microcontroller. In Arduino,the face tracking is coupled with the servo motors which directly controls the Gun for tilting, rotation and triggering. Thus, it could fire the enemies automatically when they comes into the range of the camera.