

Border Surveillance Bot

Project Report

An attempt to implement an border surveillance system using Firebird-V robot in Python.

Under Guidance of **Prof. Kavi Arya**

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1. Introduction

Cross border trespassing has become a major issue this days as our neighbors are pumping in terrorists into out territory and surveillance is of outmost importance in maintain strong hold in critical areas in an active war where in would be too dangerous for our troop. Hence there is a requirement for efficient, always working surveillance and targeting system in order to achieve the above. Our project is a gentle step in that direction

2. System Architecture

The system consists of:

a) Surveillance Robot:

Surveillance Robot scans the entire region for people (abstracted as faces) and shoots (abstracted as sequence of beeps) them based on the instructions from the central server.

b) Central Server:

Central Server receives the video input from the bot and then tries to identify the faces and then instructs the robot to shoot the targets.

3. Proposed System Operation

The server receives feed from the camera attached to the bot and then tries to identify faces in the frames, if there is one face it will align the bot to the face (abstracted for the gun) and does a beep operation (abstraction for the gun shot). If there are multiple targets then it tries to identify one of them and shoots and retracts to its position and continues the scanning based on the instructions from the central server.

4. Work Division:

- ☐ Serial Communication for firebird:
Pradeep and Sameer
- ☐ Image processing and serial communication for PC:
Harish and Rajesh

5. Testing Plan

- ☐ Testing for acquisition of single face placed in the field of view of firebird.
- ☐ Testing for acquisition of single face placed not in the field of view of firebird.
- ☐ Testing for acquisition of three faces placed in the arena in the field of view of firebird.

6. Requirements

Hardware Platform

- ☐ Firebird V ATMEGA2560
- ☐ USB-Camera
- ☐ Serial port communication cord
- ☐ Computer with Linux installation for running the surveillance algorithm
- ☐ Windows based computer for programming the bot.

Software

- ☐ AVR Studio 4
- ☐ Python
- ☐ OpenCV
- ☐ Pyserial