Human Obstacle Detection

Proposal: Human obstacle detection using monocular camera for mobile robot

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Human Detection

Acme Manufacturing

Overview

ACME Robotics is planning to build an autonomous robot that can maneuver through a field. The robot should be able to detect humans as obstacles and make informative decisions to travel through the area without collision.

Approach

1. Develop a system that can detect humans through the video stream and recognize the human obstacles in real time.
2. The input stream of images will be using a monocular camera.
3. The project will be developed using C++ as programming language,OpenCV for image processing and YOLO as object detection algorithm along with CMake build system.

Objective

Detection of Humans with accurate co ordinates of each human in the vision with respect to the robot frame of reference

Task 1:
Develop a program to detect and track humans using a monocular camera in the field of vision. Making assumptions and estimating the depth perspective of human position. Converting the coordinates to robot frame of reference. Using images of humans in a field to rain and test the model and create unit tests.

Task 2:
Refining the algorithm to track humans by eliminating false positives and creating tight bounding boxes. Using video input to display output in order to replicate a live feed from the robot.

Timeline and Management

Time Line:
Project Phase 1 Due Date: 19th October 2022
Project Phase 2 Due Date: 26th October 2022

Deliverables:
Phase 0: Proposing a solution, Initiating version control, and Developing Stub Codes and tests.

Phase 1: Iterating through one week sprint to develop unit tests and implement code. Providing 90% coverage using Coveralls and Travis

Phase 2: Implementation and simulation of the software. Preparing and submitting all deliverables.