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Monitoring and Detection of Production Units for Various Objects

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ABSTRACT: A complex area of computer vision is real-time object detection .Taking hardware and cost into consideration, an affordable, compact, less power-hungry and high-performance machine Raspberry Pi is used for experiments, which may be used more than ever in near future. These pre-trained models are fine-tuned and trained for a custom object by using transfer learning and deployed on Raspberry Pi to evaluate if it is suitable for real time object detection.

I. INTRODUCTION

Several interesting and impressive innovations are being done in the field of Artificial Intelligence (AI) and Machine Learning (ML). Since the year 2015, the revolutionary change that it had brought in the field of computer vision is enormous. Many unsolvable problems are being solved and huge amount of money is being invested in research and innovation in this field. the recent years most of us have probably heard about the success of Neural Networks (NN) and Deep Learning (DL) in fields like image classification, object detection [1], speech recognition, segmentation and Natural Language Processing. NN is a programming model inspired by biology that allows machine to learn from observational knowledge and DL is a strong range of learning methods used in NN [2]. They are currently popular and driving some of the ingenious inventions of the century. The importance of automating the process of finding accurate and high-performance driven architectures to save energy and speed up the process is considered while developing AI models. The incredible ability of NN to learn from environment and data makes them the first choice for machine learning scientists. Our focus is to build a cheap yet powerful real time object detection method on Raspberry Pi .Object tracking is implemented on these models with the help of Open CV library on a very highly effective technique. Results are collected and evaluated by using Raspberry Pi. Due to increased use of commercial applications, such as surveillance systems, mobile robotics, driving assistance systems, etc. Object detection has evolved to be one of the main areas of study. By definition object detection and tracking are identifying an object and the position of an object (or multiple objects) over an image sequence known as frames.

Aim and Objective: This project aims for exploit the capacity of raspberry pi technology in order to develop a tracking platform with compatible tracking algorithms for the raspberry pi's system. The area and scope of work involves interfacing between hardware/circuit with raspberry pi and software development which consisted of tracking algorithm implementation. There is also an interest in exploring the data communication transmission of raspberry pi through a network for tracking purposes. This concept is to allow two cameras to "communicate" to each other and share the data acquired respectively for tracking an object in a wider framework. This project model simulates the fundamental principle of a surveillance system which can track a specific object over certain distances with multiple cameras. All in all, the two primary goals of this project are to develop a tracking system which is able to locate a specific object and perform tracking within its framework and establish a smart tracking system where two cameras can track the target within its respective frameworks and share the data acquired to each other through a network.

II. LITERATURE SURVEY

2.1 P. Angelov, P. Sadeghi-Tehran, R. Ramezani," A Realtime Approach to Autonomous Novelty Detection and Object Tracking" in Video Streams, International Journal of Intelligent Systems, ISSN 0884-8173, invited paper. The project mainly focuses on the basis to implement the object detection and tracking based on its color, which is a visual based project i.e., the input to the project will be the video/image data which is continuously captured with the help of a webcam which is interfaced to the Raspberry Pi. It will detect the object and it tracks that object by moving the camera in the direction of the detected object.

2.2 "Implementation of Line Tracking Algorithm using Raspberry Pi "Conference Paper · December Samreen Amir, Bhawani Shankar Chowdhry. , International Journal of Intelligent Systems, ISSN 0884-8173, , invited paper. The proposed

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system performed according to its expectation. The Raspberry pi offers better size but less speed. Accuracy of both systems was similar even if the FPS rate is very different. Our algorithm can be implemented to almost any marine environment given the task for which it is designed for.

2.3. Global Journal of Advanced Engineering Technologies, Special Issue (CTCNSF-2014) ISSN (Online): 2277-6370 & ISSN (Print): 2394-0921 "OBJECT DETECTION AND TRACKING USINGIMAGE PROCESSING" Vijayalaxmi, K.Anjali,B.Srujana, P.Rohith Kumar. The basic detectionprocess consist of scanning the image lattice and at each location s testing whether Xs+W is classi_ed as object or background. This is typically done at multiple resoltions of the image pyramid to detect objects at multiple scales, and is clearly a very intensive computation. There are a number of methods to make it more ancient.not be feasible. But the system is based on GSM module the time for receiving messages may fluctuate due to the public GSM network traffic which is actually a major drawback of a system.

III. METHODOLOGY

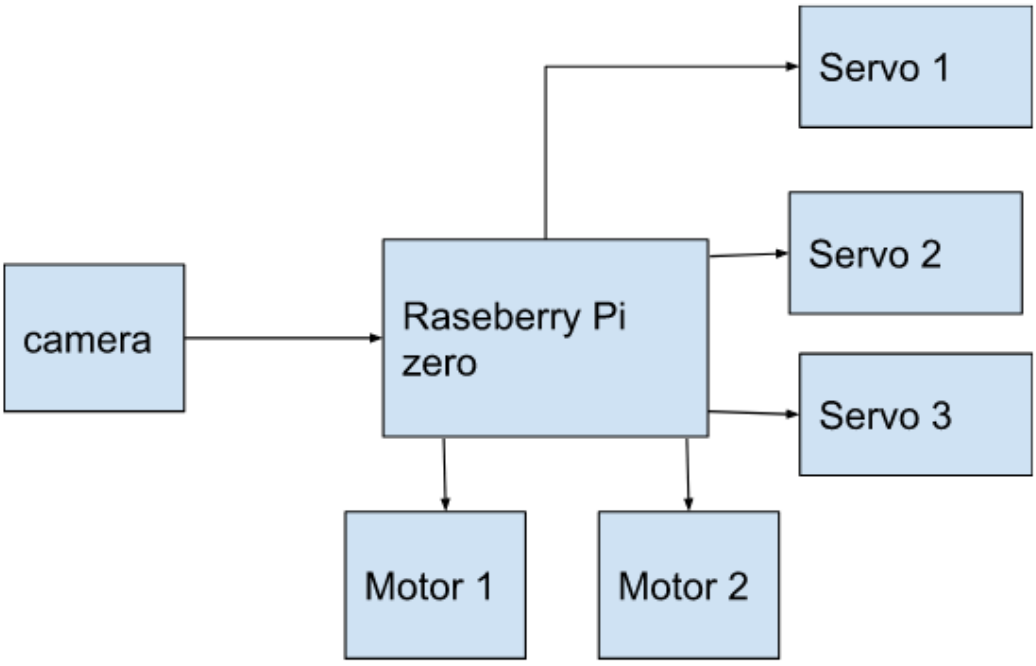

Fig.1 Block diagram

Description

In these we used the raspberry pi zero as a microcontroller. Camera is an input device which is connected to the raspberry pi zero. The three servo motor is connected to raspberry pi as an output device and the 2 Dc motor is connected as to raspberry pi zero as output device.

IV.CONCLUSION AND SCOPE FOR FUTURE STUDY

In this study, by installing OpenCV libraries on Raspberry Pi, the process of defining nearly 3 objects in total was carried out. In order to make clearer and better quality vectorial and object detection of the defined objects When an object is detected, the vector drawing of the detected object is drawn by the Drawing Machine assembled.

In order to further develop this work and improve charcoal drawings, the calibration settings of the Brachio Graph library can be further adjusted, resulting in more accurate and sharp results. In addition to editing the calibration settings in future studies, it can be ensured that these drawn objects are identified by Raspberry Pi again to improve this work. Visual intelligence can be developed with mobile applications. For example, a mobile game can be created on a mobile platform to improve visual intelligence for children aged 3-6. In this mobile application, by offering children options for each photo, the accuracy rates of the

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identified objects can be compared, and the accuracy rates can be increased by writing new search and finding functions under the Brachial Graph library for calibration of low-known objects.

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