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Servo Motor Gate Control Based On Artificial Human Detection

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ABSTRACT: In this research work, most doors are controlled by persons with the use of keys, security cards, password or pattern to open the door. The aim of this paper is to help users for improvement of the door security of sensitive locations by using face detection. Face is a complex multidimensional structure and needs good computing techniques for detection.By using face detection, it can identify only the facial part of an image regardless of the background of the image. This paper is comprised mainly of two subsystems: namely face detection and automatic door access control. Face detection is the process of detecting the region of face in an image. The door will open automatically for the human due to the command of the Arduino board. Since servomotor reduces the dimensions of face images without losing important features. Although many training images are used, computational efficiency cannot be decreased significantly. Therefore, face detection using servo motor can be more useful for door security system than other face detection schemes.

KEYWORDS: Arduino, Servomotor, Face Detection, Security

I. INTRODUCTION

In the real world, the unsecured zone causes more abnormal and coincidence which degrades the developed countries in the world. In focus, the real-time security system plays a vital role in contributing to the insecure zone. Taking the unsecured zone into consideration, the proposed research manipulates a highly secured system for the identification of fake people entering the organization leads to the discomfort of the organization. This research paper proposes a real-time automatic gate control system which imposes highly secured organizations like Schools, Hospital, Industries, Colleges, etc where authorized persons are only allowed into the organization. In contribution to the aforesaid organization, the real-time security system is developed to bring the advance to the new technology from manual to the automation. This efficient system incorporates PIC16F877A, RFID module, LCD, Servo motor, GSM module, and Mobile to implement the complete secured system.Automatic gate control of the organization can be controlled by using a servo motor based on the application algorithm into the microcontroller. The servo motor aids in position control of the gate, which is more preferred for the real-time application. The motion of gate preferred in this research horizontal sliding gate where a single person could enter at a time, thus mass entry of the people is strictly prohibited for the secured system. Here, the servo motor is controlled exactly 90 degree to open the horizontal sliding gate for the known tag which is available in the database, nothing but the memory of the microcontroller. In this paper, the PIC16F877A microcontroller is used owing to low cost and more efficient for the real-time application. The maximum operating frequency of PIC16f877a is 20MHz, which suits the real-time security application. In this proposed research, the consequence of an algorithm that is dumped into the EPROM of the PIC16F877A microcontroller identifies original and fake tags and does require an operation to open the gate using servo motor or intimate about the fake person or ID to the authorized organization using Camera.Artificial Intelligence (AI) is the term used in the AI Camera. An AI Camera, on the surface, performs automatic scene recognition. When you aim your camera in the right direction, the AI Camera takes over and adjusts the settings for you. Artificial intelligence is a computer system that can perform tasks that would normally require human intelligence (AI). Machine learning powers many of these artificial intelligence systems, while deep learning powers some. In bright light, AI cameras can automatically combine HDR images, move to multi image capture mode in low light, and use computational imaging to create a stepless zoom effect as two or more camera modules can be used.

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II. LITERATURE SURVEY

M. Sazawa and K. Ohishi [**2009**] have designed a control system based on a fast continuous path tracking mechanism for the flexible position control in 2009. In this control strategy, the saturation of the torque and the coordinated motion were taken into account. For the starting and final Position, large accelerated or decelerated torques was needed; thus, the PI controller had small loops of the control acceleration to provide some output. This limited output method, compensated for the corresponding output and constructed the limiter of the speed controller. On the other hand, a time of deceleration, which was the duration from the commencing brake time to the finishing brake time, was proposed, and within this time, the control system was decelerated utilizing the highest torque. The commencing time of the brake was known by the torque of the load and the targeted position. The distance of the movement was delighted as the error of the position until the targeted position. This control technique had a good step response, and it did not have oscillatory errors and overshoot. Moreover, it also reduced the tracking error that occurred because of the dynamic load. However, it did not fully eliminate the error. Its tracking radius error was 0.02 rad. The system complexity and high gains of the controller may have consumed a lot of energy due to the PI controller. The system settled at 1.041 seconds, whereas under conventional fast continuous path tracking control, the system settled at 1.046 seconds. **J. Yin et al. [2013]** proposed another servo motor controller, which utilizes a Fuzzy Adaptive PID based on the DSP. This control strategy was adopted using Three control loops, which were the current loop, speed loop, and position loop. This control strategy played a role in improving the dynamic response of the system and adjusting the faults at the slow speed. This control strategy was designed based on the linear motor position motion law, according to which a large error could be quickly eliminated by increasing the weight of the error control function. To eliminate the overshoot of the system with an increase in error, the weight of the error-change control action was increased.**Kadan et al.** designed a low-speed control of AC servomotors in no-load condition. The designed control method utilized adjustable torque ramp option. During the mode of torque control, the torque ramp option was specified to know the supplied control voltage of the drive proportional to the specific amount of torque. A proper control signal could be sent to the drive by assigning a proper value to the torque ramp option. Since the control signal was properly measured, and the prior amplitudes of the noises were known. Hence, this helped to reduce the effects of the noise in the later iterations. Moreover, the motor torque was regulated by scaling down the least noise affected signal by the drive. As the drives were strongly safeguarded, the noise could not affect the internal signal of the drive.**Y. Seki et al., (2015),** suggesting another control strategy , the suggested control strategy improved the voltage utilization on the constraint of the region of flux weakening by the combination method of flux weakening control and the Inverter modulation arrangement. When saturation in the voltage appeared, the control of flux weakening operated utilizing the d-axis current and terminated the saturation in the voltage. Saturation in the voltage occurred when the voltage vector crossed the output limitation. In order to keep this vector in the inscribed circle, the desired d-axis referenced current was known by the inverter control scheme. Furthermore, the speed control arrangement of the Servo system was considered by the phenomenon of the windup and the control methodology of the conventional flux weakening. The speed response tracked the reference speed and determined the reference axis current.**Kaplan et al., (2019)** AI techniques, also called machine intelligence, can provide a better performance in various data-processing tasks. It can be defined as a system's ability to correctly interpret external data, to learn from such data, and to use those learning's to achieve specific goals and tasks through flexible adaptation. AI techniques in this paper focus on the recent emergence of deep learning methods, new network structures, and intelligent machine learning methods, which are inspired by biological systems. Traditional machine learning methods, such as support vector machines and decision trees, have not been considered in this review due to their relatively low intelligence and existing reviews.**Michalis Vrigkas et al., (2015)** proposed Recognizing human activities from video sequences or still images is a challenging task due to problems, such as background clutter, partial occlusion, changes in scale, viewpoint, lighting, and appearance. Many applications, including video surveillance systems, human-computer interaction, and robotics for human behaviour characterization, require a multiple activity recognition system. In this work, we provide a detailed review of recent and state-of-the-art research advances in the field of human activity classification. We propose a categorization of human activity methodologies and discuss their advantages and limitations. In particular, we divide human activity classification methods into two large categories according to whether they use data from different modalities or not. Then, each of these categories is further analysed into sub-categories, which reflect how they model human activities and what type of activities they are interested in. Moreover, we provide a comprehensive analysis of the existing, publicly available human activity classification datasets and examine the requirements for an ideal human activity recognition dataset. Finally, we report the characteristics of future research directions and present some open issues on human activity recognition. **Aggarwal, Jake K et al., (2014)** proposed Human activity recognition has been an important area of computer vision research since the 1980s. Various approaches have been proposed with a great portion of them addressing this issue via conventional cameras. The past decade has witnessed a rapid development of 3D data acquisition techniques. This paper summarizes the major techniques in human activity recognition from 3D data with a

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focus on techniques that use depth data. Broad categories of algorithms are identified based upon the use of different features. The pros and cons of the algorithms in each category are analysed and the possible direction of future research is indicated.

III. PROPOSED SYSTEM

In this paper, counts more secure to the organization in real-time. The new technique proposed in this paper is more unique and comfortable to large organizations to secure their properties without been stolen by the unknown person. Most of the existing studies in this field failed to efficiently describe human activities in a concise and informative way as they introduce limitations concerning computational issues. In particular, we may conclude that despite the tremendous increase of human understanding methods, many problems still remain open, including modeling of human poses, handling occlusions, and annotating data.

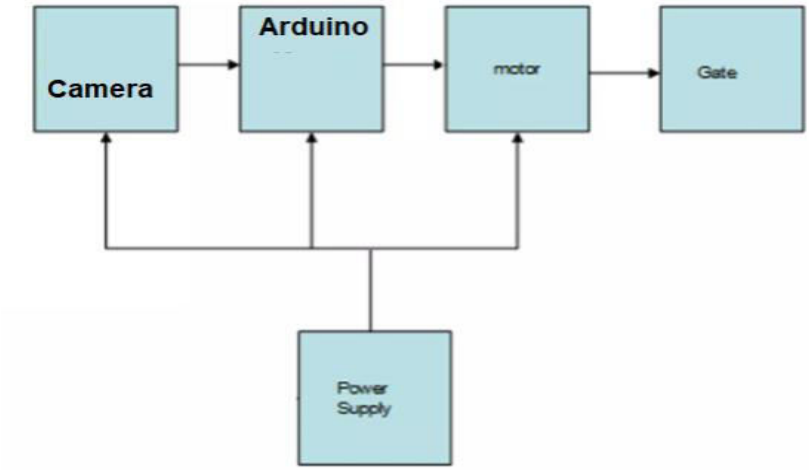

Figure 3.1 Block diagram of the Proposed System.

IV. CONCLUSIONS

In this proposed system, the servo's motors are widely used in features operate remote-controlled or radio-controlled toy cars, robots and airplanes. Servo is used to position control surfaces because it has built-in control circuitry and good power. Servo motors are also used in industrial applications, robotics, in-line manufacturing, pharmaceutics and food services. Servo is used in in-line manufacturing because high repetition and precise work is requirement to produce goods with high efficiency. In food services and pharmaceutics, the equipment design with servo is used in harsher environments because the potential for corrosion is high due to being washed at high pressures and temperatures repeatedly to maintain strict Hygiene.

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