AUTOMATICALLY FOCUSING PROJECTOR MOUNT

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Abstract— An innovative approach is shown that can allow projector to focus projector image automatically corresponding to the screen in order to reduce trapezoidal distortion. This new but simple technique permits the projector mount to tilt according to Display Screen.Combining The use of LDR and RF modules,We show that the image positioning can be done in two modes ie.Automatic and manual mode. Several experiments are reported also by using a cheap, light-weight cameras to demonstrate that the proposed approach allows real-time operation by portable light-weight device.

Index Terms— Blinding Light Suppression , Graphics Processing Unit,Image tilting, Light dependant resistor, Peripheral Interphase Controller, RF modules, Virtual Rear Projection.

1 INTRODUCTION

THIS paper demonstrates introduction of the 2-D image sensor enables the autofocus to automatically adjust the focus with just press of a button. The auto focus project a focus display content on an ordinary screen which can move freely within the projection area. such a system can give users greater freedom of control of the display such as the viewing angle and the distance. At the same time, the size of the screen can be fit into a size that fits one's application.

To obtain a desired image projection of an object or specimen by optical projection means usually involves manual adjustment of the focus of the system. Where the projection means is, for example, a slide projector of the type well known to the art, variations due to manufacturing tolerances in the slide holder, bulging of the slide either from the heat of the projection lamp or from distortions occurring in the photographic processing of the slide, variations in thickness or warping of the slide frame, will all change the focus from an initial adjustment and destroy its sharpness.

As a result, the location of the actual film surface and the image bearing emulsion which it carries, with relation to the edges of the mounting on which the slide must be held, can vary by considerable amounts.

2.EXPERIMENTAL DESCRIPTION

2.1 Project Description

The proposed system is to design and construct an automatic focusing projector holder using low cost and locally available material. This is done by Using LDR sensor placed just outside the screen which senses the light from the projector when it exceeds and an information sent to the mount for adjustment. This mount provide up and down tilt to the projector for screen adjustment. The objective of the project is to design and construct an automatic focusing projector holder using low cost and locally available material. This projector aims to focus projector image automatically corresponding to the screen in order to reduce trapezoidal distortion. When the projector image exceed the screen size, the mount itself adjust the image size and make fit for the screen. This is done by Using LDR sensor placed just outside the screen which senses the light from the projector when it exceeds and an information sent to the mount for adjustment. This mount provide up and down tilt to the projector for screen adjustment. Fixed projector mount is time consuming and cause distortions…etc. Therefore we propose a system in which the distortions of projector can be reduced and monitored on the screen.

We propose a system in which the distortions of projector can be reduced and monitored on the screen. The design is done with DC motors. Whenever there is any difference in the focusing pattern the project helps to remove the error either automatically or manually.

2.2 BLOCK DIAGRAM

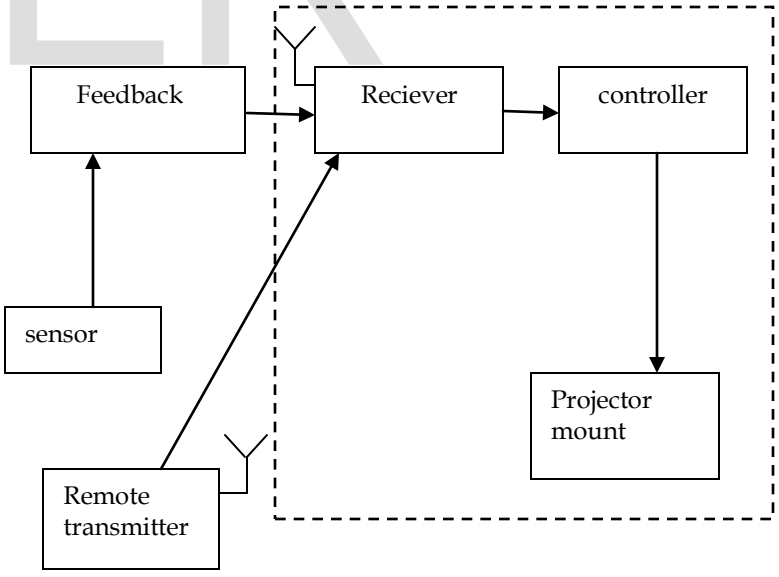

Fig1:Block Diagram

2.2.1 BLOCK DIAGRAM DESCRIPTION

Block Diagram consist of LDR as sensor ,Microcontroller pic 16f877a, dc motor, L293D, LM741, sensors and so on… Each LDR gives the digital signal as output. Accordingly with the given data the pins of the pic wil become active and corresponding output will be got. Each LDR refers to the sensor in the circuit. Sensors senses each input and the motors will au-

tomatically shift their positions for proper focussing. When 2 LDR are active at a time then the combinational circuit will give out the output and correspondingly the motor will began to work and the screen will be foccused. Each motor is designed to focus into left, right, top and bottom of the screen.
LDR module consist of resistors, capacitors, op amps, LDR and so on… there exists 2 inputs and 2 outputs. Whenever the VCC is given then the power led will lit. a capacitor is used to filter out the ac component to the ground and will not allow the dc component. A 10k pot is installed for setting the critical value to the comparator . LDR act as a reisitor in which its resistance increases with the light. Thus the voltage at that point increases and it if fed to the comparator. Comparator compares the each input and the output will be given as VCC or GND. At the output a capacitor is fixed to filter out the unwanted spikes. Accordingly with the output, the output led with change intensity.

2.2.3 ALGORITHM

Step1 : Start.
Step2 : Header files initialization
Step3 : Variable declaration.
Step4 : Turn on the power supply either automatic or Manual mode.
Step5 : If automatic mode then go to next step otherwise operate according to the remote output.
Step6 : check the focus.
Step7 : If screen is out of focus then go to next step . otherwise jump to step10
Step8 : Rotate the motor1 in forward.
Step9 : Repeat step6.
Step10: check whether the projector image is inside the boundary then go to next step otherwise jump to step13.
Step11: Rotate the Motor in backward direction
Step12 : Repeat step10.
Step13 : Stop

3 SIMULATION

The proposed system consist of two mode of operation.We are using switch here In order to control the operation.If switch is on it will be in manual mode else it will in automatic mode.In manual mode, based on remote output the mount adjust its focus. when we press more than one button at a time then it will execute all the functions of the pressed button.Here we use 6 buttons for left,right, up, down,forward and backward movements and also we are using 2 buttons for future developments.Remote is builded using Rf433 Mhz transmitter.To receive the transmitted signal, Rf433Mhz receiver with atmega 328 P is mounted at projector side.If remote switch is off then the system will work in automatic mode.In this mode we have placed 4 sensors on the border of the projector display.sensors identify distortion and send datas through Rf2.4Ghz transceiver.this will be received by atmega 328.we placed 16*2 display in both controller and sensor side.the display is used in sensor side to detect error and in controller side to display the movement of the projector.If more than one sensor show error then the mount will move in forward direction.also it will display whether it is manual or automatic.

4 CONCLUSION

The concerned project gives the detailed view on the mount of a projector. It gets activated whenever the screen is not in the correct position or else. The project helps to focus the projector to the screen automatically and manually with the help of LDRs and the predetermined circuit diagram. It has an advantage that it will work with less distortion of signals and it focuses with high pixels. The LDR, which is highly dependent on the light waves will help the projector to work with high priority to the light sources. So that any of the changes in the position the projector, manually will be located and for mini problems it will automatically correct. So thus the deisgned projectors works. By accomplishing the project we were able to reduce the time for focusing and also the trapezoidal error has overcome.

ACKNOWLEDGMENT

This paper was supported and guided by our beloved teacher Mrs.charulatha.it is also supported by Mr.KrishnaKumar(HOD of ece department,RCET).The authors would like to acknowledge the comments made by teachers and friends which contribute to improve the paper.

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