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Cost Effective Touch Screen Based Tables for Restaurants Using Video Processing

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Abstract: In today's world we have automation in all areas; there is one field where technology not entered yet. It is the menu display and ordering system and so far there is no initiative to taken to introduce technology in this area. Cost effective touch screen based table is the solution by which customers will be able to select any items of their choice which are in menu display and that order will be transferred to the manager personal computer and that ordered item will be served to that customer.

Keywords: Touchscreen; Cost-effective; Video Processing

I. INTRODUCTION

A touch screen is an input and output device normally layered on the top of an electronic visual display of an information processing system. A user can give input or control the information processing system through simple or multi-touch gestures by touching the screen with a special stylus or one or more fingers. There are a variety of touch screen technologies with different methods of sensing touch. The two major types of touch screens are capacitive touch screens and resistive touch screens.

- Disadvantages of touch screens when installed as tables in restaurants to attract customers-
- Risk of damage by sharp object, spillage of beverage.
- Huge maintenance costs.
- Very high installation costs.
- Produces e-waste.
- Poorer contrast, due to additional reflections (i.e.: glare) from the layers of material placed over the screen.
- Need to press down.

In order to overcome the above mentioned issues, we intend to design and develop a touch screen for restaurants which are easily affordable, hassle free and eco-friendly, using video processing in real time.

The main objective of our project is to streamline the operation of a restaurant and improve customer experience by developing a cost effective touch screen based table.

II. LITERATURE SURVEY

The paper [1] proposes a contactless touch screen that produces tactile sensation just 1-3cm before the actual touch on the screen.The system has a screen, visual projectors, and sensors for finger motion detection, which composes a non-contact touch screen by gesture sensing. In this paper we add a non-contact tactile display using an airborne ultrasound phased array. The key device of the system is a screen that is a scattering plane for visual projectors and transparent for ultrasound. We show the design of the screen and examine the effectiveness through numerical simulations and experiments. The screen has an additional property that stops the air flow going through the screen maintaining the transparency for the ultrasound. The disadvantage of this paper is this solution uses ultrasound to detect touch which is very costly.

The paper [2] reports a sensing principle and FPGA design of a capacitive touch pad/interface where the sensing pad is connected to the I/O pin via an external resistor. The circuit transforms the change in pad capacitance into voltage amplitude during charging, discharging and sharing phases. By using multiple pins and resistors, a multipad system is achieved. The sensing algorithm is implemented in VHDL code. The read-out cycle is parallel and short, what results in a high noise immunity in low frequency range. The silicon/hardware requirements are minimal. The interface can be easily embedded into a system-on-chip and used for human-machine interface. The disadvantage of this paper is uses normal capacitive touch.

Main defects of infrared touch screen are low resolution and sensors to be easily damage, which makes it can't realize the accurate positioning. To overcome infrared screen principle inherent defects, [3] proposes a new solution by the principle of innovation, with a laser tube instead of the infrared emission tube, plastic optical fiber instead of the infrared receiver, CMOS sensor instead of complex circuits, which resulting a design of touch-screen with high resolution infrared based on plastic optical fiber and image processing. The disadvantage of this paper is this solution uses an array of optic fibers to detect touch. This is again a costly process.

III. PROPOSED SYSTEM

We propose to develop a touchscreen which detects the item selected by the customer by performing video processing on the shadow cast due by the finger. In order

to detect the item selected the coordinates of the blob video processing is done. The coordinates of the blob is blob is compared with the predetermined coordinates of the items in the menu; this gives the item selected. In order to eliminate false inputs to the system we have included an active. The system is automatically deactivated after the customer accepts his order.

IV. BLOCK DIAGRAM

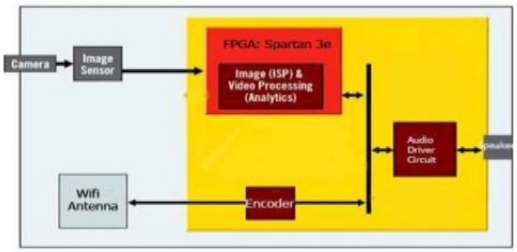


Fig 1. Block Diagram

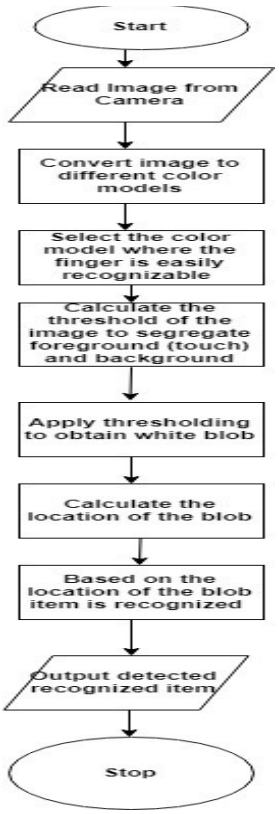
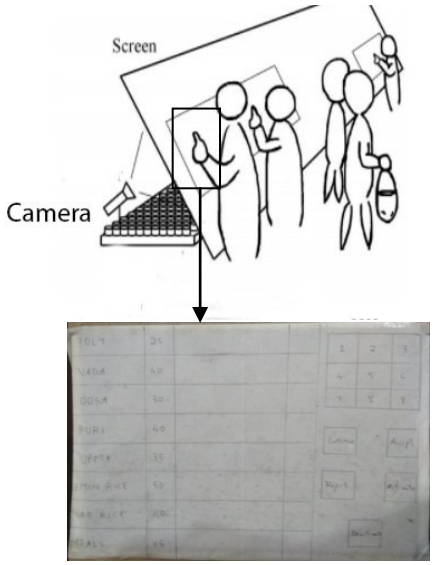


Fig 2. Flowchart

V. RESULT



VI. CONCLUSION

In this paper a techniques for developing a cost effective touchscreen for restaurants has been proposed. The proposed touchscreen is a elegant, hassle free and eco-friendly solution for restaurants. This system will improve the user experience.

ACKNOWLDGEMENT

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