MEMS Based Drawing Character and Recognition Using Raspberry Pi

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Abstract- Gesture Recognition is an innovation which is utilized to recognize human signals with the assistance of scientific calculations. Motion acknowledgment perceives the hand, tracks the hand developments and additionally gives data about hand position introduction and transition of the fingers.

Micro electro mechanical systems (MEMS) sensors are applied to sense the motion information produced by characters written by human subjects. The muIMU is built to record the three-dimensional accelerations and angular velocities of the motions during hand-writing. The illustration application enables the client you to draw on any surface. The photos that are drawn by the client can be put away and supplanted on some other surface. The client can likewise rearrange through different pictures and drawing by utilizing the hand signal developments. The characters drawn can be stored in the form of image file and recognised by using Teserract algorithm. We can draw any number of Characters.

Keywords- Gesture, MEMS, client, Tesseract algorithm.

I.   INTRODUCTION

The framework comprises of ARM11 Raspberry Pi gadget, MEMS and Projector. There are shading markers set at the tip of client's fingers. Denoting the client's fingers with red, yellow, green and blue shaded tape encourages the MEMS to perceive the hand signals. Caught signal picture is exchanged to the ARM11 Raspberry Pi gadget for additionally handling. Projector gets the data from the ARM11 Raspberry Pi gadget and undertakings on to a specific surface or screen.

Gesture Recognition may be a technology that is employed to spot human gestures with the assistance of mathematical algorithms. Gesture recognition acknowledges the hand, tracks the hand movements provides data concerning hand position orientation and flux of the fingers.

The colour markers square measure placed at the tip of the user fingers. This helps the MEMS Sensor to spot the movement of hand and therefore the gesture recognition. The drawing application permits the user you to draw on any surface by following the tip movements of the user's forefinger. the photographs that square measure drawn by the user will be keep and replaced on the other surface. The user may shuffle through numerous photos and drawing by exploitation the hand gesture movements.

II.   EXISTING SYSTEM

Sensor based computerized pen. Use sensors to recognize the shading. Need of board to compose. Speed is less. Less exactness. Using Matlab which has less edge rate.

PROPOSED SYSTEM

Gesture based computerized pen .Using light weight module i.e. Open CV with high edge rate. Colour following is finished utilizing HSV technique. High exactness and speed.
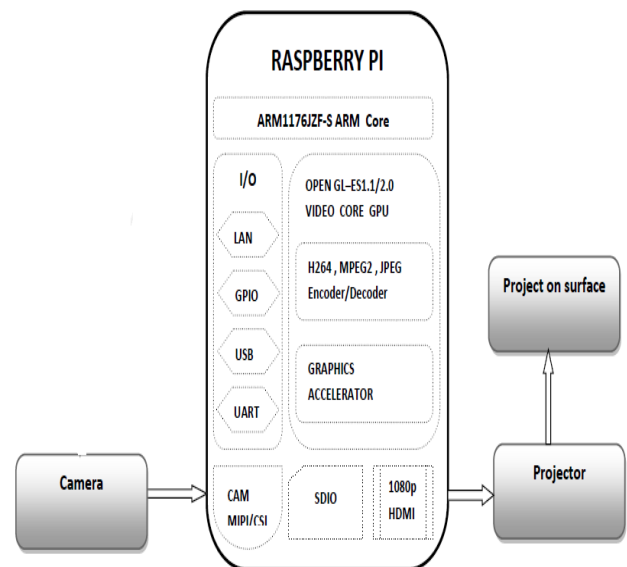
BLOCK DIAGRAM

Fig.1- Block Diagram

The framework comprises of ARM11 Raspberry Pi gadget, MEMS and Projector. There are shading markers put at the tip of clients fingers. Denoting the client's fingers with red, yellow, green and blue hued tape encourages the MEMS to perceive the hand motions. Caught motion picture is exchanged to the ARM11 Raspberry Pi gadget for additionally handling. Projector gets the data from the ARM11 Raspberry Pi gadget and ventures on to a specific surface or screen.
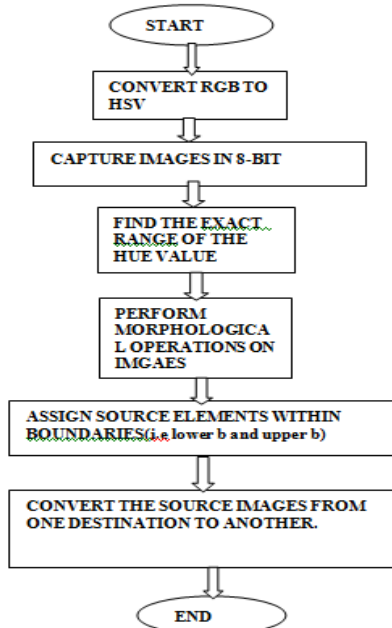
FLOW CHART

Fig.2: Flow chart

HARDWARE COMPONENTS
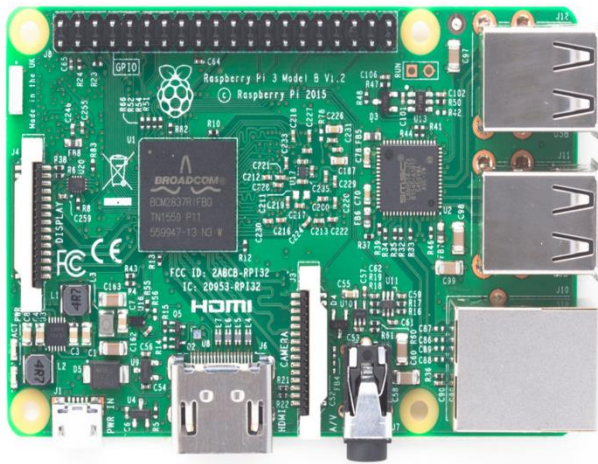**Raspberry-pi**

Fig.3: Raspberry-Pi

The Raspberry Pi 3 Model B is the third generation Raspberry Pi. This powerful credit-card sized single board computer can be used for many applications and supersedes the original Raspberry Pi Model B+ and Raspberry Pi 2 Model B. Whilst maintaining the popular board format the Raspberry Pi 3 Model B brings you a more powerful processer, 10x faster than the first generation Raspberry Pi. Additionally it adds wireless LAN & Bluetooth connectivity making it the ideal solution for powerful connected designs.

MEMS SENSOR

Fig.4: MEMS Sensor

MEMS accelerometers are one of the simplest but also most applicable micro-electromechanical systems. They became indispensable in automobile industry, computer and audio-video technology. This seminar presents MEMS technology as a highly developing industry. Special attention is given to the capacitor accelerometers, how do they work and their applications. The seminar closes with quite extensively described MEMS fabrication.

An accelerometer is an electromechanical device that measures acceleration forces. These forces may be static, like the constant force of gravity pulling at our feet, or they could be dynamic - caused by moving or vibrating the accelerometer. There are many types of accelerometers developed and reported in the literature. The vast majority is based on piezoelectric crystals, but they are too big and to clumsy. People tried to develop something smaller, that could increase applicability and started searching in the field of microelectronics. They developed MEMS (micro electromechanical systems) accelerometers.The first micro machined accelerometer was designed in 1979 at Stanford University, but it took over 15 years before such devices became accepted mainstream products for large volume applications [1]. In the 1990s MEMS accelerometers revolutionised the automotive-airbag system industry. Since then they have enabled unique features and applications ranging from hard-disk protection on laptops to game controllers. More recently, the same sensor-core technology has become available in fully integrated, full-featured devices suitable for industrial applications [2]. Micro machined accelerometers are a highly enabling technology with a huge commercial potential. They provide lower power, compact and robust sensing. Multiple sensors are often combined to provide multi-axis sensing and more accurate data

III. SOFTWARE TOOLS

Linux
Linux is a free open source working framework and it has a place with the Unix working frameworks. In reality Linux implies the piece itself which is the core of the working

framework and handles the correspondence between the client and equipment. Regularly Linux is utilized to allude to the entire Linux dispersion.

Linux appropriation is a gathering of programming in view of the Linux Kernel. It comprises of the GNU-task's parts and applications. Since Linux is an open source venture, anybody can alter and circulate it.

Raspbian Wheezy

Raspbian Wheezy is a free working framework in view of Debian appropriation. It is made by a little group of designers who are enthusiasts of Raspberry Pi. Raspbian is improved for the Raspberry Pi's equipment and it accompanies more than 35000 packages and pre-incorporated programming. Raspbian is still under dynamic advancement and it intends to enhance the solidness and execution of the Debian bundles
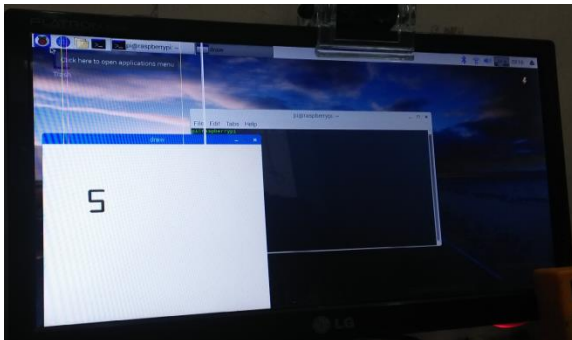
Python

Python is a multi-worldview programming dialect: protest arranged programming and organized writing computer programs are completely upheld, and there are various dialect highlights which bolster practical programming and viewpoint situated programming (counting by meta programming and by enchantment strategies). Numerous different standards are bolstered utilizing expansions, including configuration by contract and rationale programming.

Tesseract

Tesseract is a great general purpose OCR tool that, while trained to recognize text in documents, is also capable of working on a large variety of problems. Like many other models, it requires that images be pre-cropped to contain only text – which means that it works extremely well when combined with a text-isolation algorithm such as Text detection.

This algorithm works not only on English text, but in over 100 different languages. As the source project improves, this algorithm will evolve as well, becoming more and more accurate.

IV. RESULT

V. CONCLUSION

This paper has exhibited one of the use of raspberry Pi. Here by utilizing our hand signals how we can executed our converted picture. With the assistance of numerical calculations we can distinguish human motions. Signal acknowledgment initially perceives the protest and afterward tracks it and furthermore gives the data about question. This is the simplest method to track a question. Another application would track a ball in cricket matches.

VI. REFERENCES

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Author Profile

Ms. Kammari Shilpa was born on March 20 1995, completed her graduation in Electronics and communications Engineering from MRCEW. Currently she is pursuing her M.Tech in Embedded Systems from St.Martin's Engineering College.

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