digital magnifier

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Abstract - This project utilizes Raspberry Pi kits to clarify unclear objects using a touchscreen and Pi camera, incorporating HD and other features to view images clearly. By zooming and enlarging images with the lens's assistance, you can observe them precisely. The USB camera directly accesses data and analyzes it. The Raspberry Pi kit retrieves data, processes it, and displays it directly on the main screen. This project aids workers in watch repairing and electronic repairing shops.

Index Terms – Raspberry pi , Pi Camera ,Memory, Linux OS, Pi Touch Screen Display, Python, Optical Lense, HDMI cable etc.

I. INTRODUCTION

A digital magnifier is an electronic device used for electronic inspection, mobile repairing, watch repairing, and viewing unclear objects. It magnifies images on a digital screen and provides greater clarity using optical lenses. Its benefits include contrast adjustment, incorporation of magnification settings for portability, and a handheld design. This makes the device extremely easy to use and portable. It can be operated on various operating systems and packages such as Linux, Raspbian, and Open CV.

II. problem statement

The project aims to create a digital magnifying solution tailored for individuals with visual impairments or low vision who encounter challenges when accessing printed material or performing tasks like mobile shop repairing and watch repairing. While conventional magnifying glasses are available they often lack adjustability, portability, and additional support features. Therefore, the challenge lies in designing and developing a digital magnification tool that provides customizable magnification level, high-contrast options, portability, and other essential features. This innovation aims to enhance the overall quality of life and independence of visually impaired users by offering improved accessibility and ease of use

III. literature survey

A literature survey is a vital step in the system development process. It entails reviewing existing research in a particular field, summarizing important findings, identifying leading authors, hypothesis, and appropriate methodologies. In this project, research comes before project initiation, involving a thorough examination of current systems to reveal their strengths and weakness.

Sri Harauti, Agus Harjo, tri Wahyu Supardi. “The developed of a high resolution, high magnificationdigital microscope is reported” the aim of the project is to zoom in the object for above 100x.

IV. block diagram

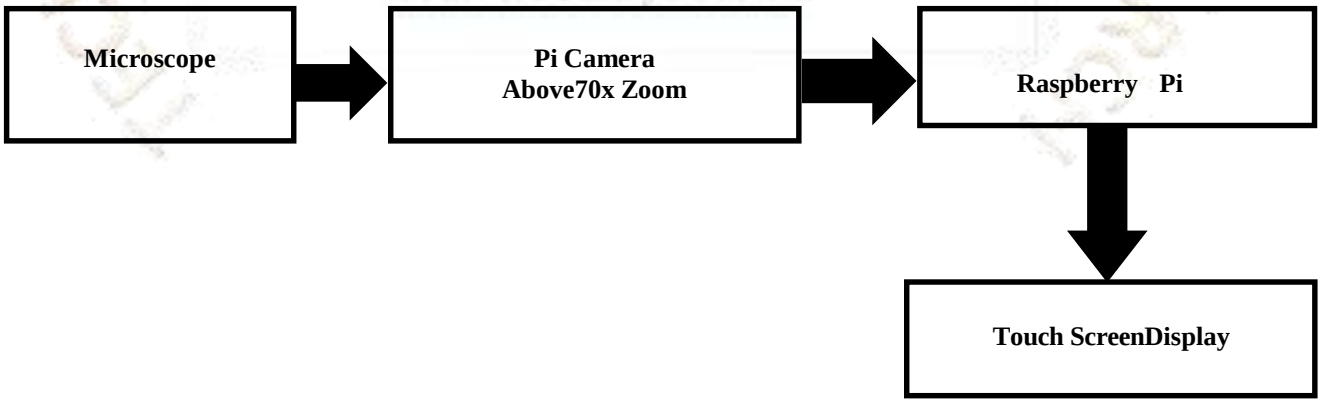

Fig.1 block diagram

V. WORKING PRINCIPLE

The Raspberry Pi kit offers a versatile platform for enhancing a compound microscope by integrating a 5-inch screen and a 5-megapixel Pi camera. Python software, coupled with the OpenCV package, enables the development of both programming logic and user interfaces. The camera interfaces with the Raspberry Pi, with its output seamlessly displayed on the attached screen. Crucially, data capture and storage are facilitated through the Raspberry Pi's SD card, enabling convenient review at a later time. This setup holds significant potential for various inspection tasks, including but not limited to mobile and watch repairs. The system boasts a user-friendly graphical interface (GUI) that affords precise control over the camera functionality via the touch screen. This GUI simplifies the process of capturing images and presenting sample conditions for analysis. Furthermore, the system offers flexibility in image capture by allowing for the interchange of optical lenses to meet specific requirements. Complementing this functionality are attached LED lights, enhancing image clarity and aiding in the capture of detailed visuals.

VI. implementation

The objective of this project is to create a digital magnifier solution for visually impaired or low vision individuals , mobile repairing shop or watch repairing shop grating them enhanced access to printed materials and improved clarity of vision. Although conventional magnifying glasses are available, they typically come with limitations such as fixed magnification levels, lack of portability, and absence of additional supportive features. Hence, the challenge lies in devising and implementing a digital magnification tool that offers adjustable magnification levels, high-contrast options for improved readability, portability for ease of use on the go, and other essential functionalities to augment the overall quality of life and autonomy of visually impaired users.

Fig.2 digital magnifier

VII. CONCLUSIONS

A digital magnifier is a tool designed to aid in the clear viewing of objects that may be difficult to see with the naked eye. Its applications range from tasks like watch repairing, mobile repairing, to electronic inspection, where precision and clarity are essential. The device functions by offering various features such as zooming in or out, adjusting brightness, contrast, saturation, and sharpness levels. These customizable settings enable users to enhance images or videos to better discern details, ensuring accurate analysis and manipulation of objects under scrutiny. Whether examining intricate components or inspecting fine details, a digital magnifier provides users with the ability to achieve a clearer and more detailed view, thereby facilitating tasks that demand meticulous observation and attention to detail.

VIII. REFERENCES

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IX. ADVANTAGES

1. variable magnification (20x to 60x) on 5-inch lcd display.
2. Ability to increase magnification by adjusting the camera height.
3. It is portable and compact as it weighs less than 1 pound.
4. Variable viewing mode

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