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Real-Time Streaming Through Secure Shell(SSH)

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ABSTRACT: Real-Time Streaming using a computer through SSH (Secure Shell) involves setting up a system where a computer captures audio and video data from a source, processes it, and then streams it in real-time to a remote destination using the Secure Shell (SSH) protocol. This can be useful for scenarios such as remote monitoring, surveillance and broadcasting. SSH (Secure Shell) is a cryptographic network protocol that provides a secure way to access and manage remote systems over an unsecured network, such as the internet. It establishes a secure encrypted, allowing users to remotely log in to a computer or device and execute commands as if they were physically present. The proposed work uses the hardware module such as Raspberry pi model 3A, Raspberry pi camera rev 1.3 and software as putty.

KEYWORDS: Secure Streaming, Companion Computing, Real-time Transmission & SSH Integration.

I.INTRODUCTION

Live streaming has become an increasingly popular way to share real-time content and it in used in aerial robotics and broadcasting the live video streaming and then the project is based on live streaming and video capturing and collecting various data images. To capturing live streaming video using Raspberrypi because it is very cost-effective and customizable and then the video quality of Raspberrypi is very high-definition version. The proposed systems is very advanced and successful feature among on present days because the Raspberrypi configuration is combination of hardware and software whether the live streaming is support in extreme condition. The aim of project is about wireless live streaming and object detection to view the camera feed from any other device on your network.

II. RELATED WORKS

Real-time streaming has various related works and applications across different domains. Here are some of the key areas where real-time streaming plays a crucial role. **IoT and Sensor Data**: Real-time streaming is used to process data from Internet of Things (IoT) devices and sensors. This data can include anything from temperature and humidity readings to real-time location information. **Financial Markets**: High-frequency trading and stock market data feeds rely on real-time streaming to process and act on market data within milliseconds. **Live Events**: Live sports events, news broadcasts, and conferences are often streamed in real time over the internet, enabling people to watch events as they happen. **Transportation and Traffic Management**: Real-time data from traffic cameras, sensors, and GPS devices is streamed to help manage traffic flow and provide up-to-the-minute information to commuters.

III. EXISTING METHOD

Real-time streaming involves the transmission and delivery of data, such as video, audio, or sensor data, in real-time or near-real-time to end-users or applications. There are several existing methods and technologies for implementing time streaming, and the choice of method depends on the specific use case and requirements. SSH (Secure Shell) is a network, such as the internet. It establishes a secure encrypted, allowing users to remotely log in to a computer or device and execute commands as if they were physically present.

IV. PROPOSED SYSTEM

Raspberry Pi along with night-vision camera, programmed using Python programming language. Raspberry Pi's IP

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address is fetched and VNC server is setup to create virtual desktop on host device for remote user. Host device is a Personal Computer/Smartphone connected to same LAN/ WLAN on which Raspberry Pi is connected. VLC media player serves as source for live streaming on host device running a VNC viewer. Findings: Previously, live video surveillance meant massive machinery, restricted to larger spaces and usually involved Closed-circuit television cameras. The technological advancements, ease of access and usability in Latter-day gadgets brought forth easier connectivity, bridging the gap between virtual and the real worlds. This makes dealing with indispensable concepts like security and surveillance much convenient, even for a remote user. Keeping in mind all these concepts, an effective; simple yet powerful design for a live video streaming and surveillance system has been proposed.

V. BLOCK DIAGRAM

The camera captures video and audio data. The Raspberry Pi processes this data using encoding software, which encodes it into a suitable format for streaming .The encoded data is sent to a streaming server, either running on the Raspberry Pi or an external server. This server handles the distribution of the live stream. The streaming server makes the live stream available over the internet. Viewers can access the live stream using their devices, connecting to the streaming server to watch the content in real-time. This is a basic block diagram and explanation for setting up live streaming with a Raspberry Pi. The specific software, configurations, and details may vary depending on your requirements and the choice of components and platforms

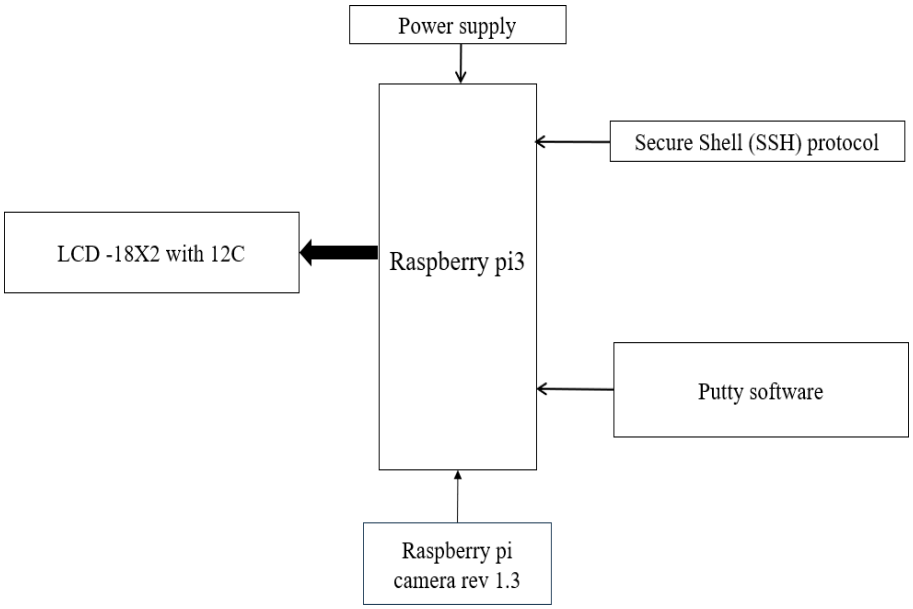

Fig 1. Block diagram of Real-time streaming

VI. EXPERIMENTAL RESULTS

The experimental results of implementing live streaming using a companion computer through SSH would likely include. **Remote Control**: Enabling remote control and management of the companion computer's live streaming process through SSH comm ands, allowing for easy start, stop, and configuration adjustments. **Real-time Streaming:** Successful live streaming of audio and/or video content from the source (such as a camera connected to the companion computer to a target platform or audience. **Low Latency**: Achieving minimal delay in the live streaming process, ensuring a near real-time experience for viewers.

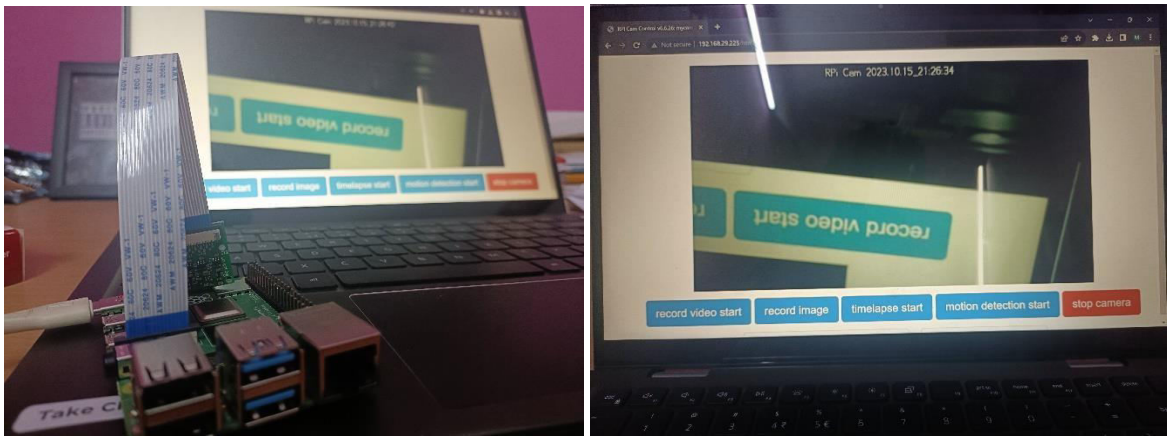

Fig 2 & 3. Experimental setup of Real-time streaming

VII. FUTURE SCOPE

The future scope of live streaming technology is broad and dynamic, with numerous exciting possibilities and emerging trends. Here are some key areas of future development and growth. **Virtual Reality (VR) and Augmented Reality (AR) Streaming**: As VR and AR technologies continue to advance, there's potential for immersive live streaming experiences. Live 360-degree video streaming and AR-enhanced streams could become more prevalent.**5G and Edge Computing**: The rollout of 5G networks will provide faster and more reliable connections, enabling higher-quality and lower-latency live streaming. Edge computing will also reduce latency and improve the user experience. **Interactive Live Streams**: Enhanced viewer engagement with features like real-time chat, polls, and interactive elements within live streams will become more prevalent. Gamification of live content may also increase. Personalization and Content Recommendation: AI and machine learning will be used to offer personalized live content recommendations, making it easier for users to discover relevant streams. **E-Sports and Gaming**: The growth of e-sports and game streaming platforms like Twitch will continue, with more professionalization and integration of gaming content. **Education and Remote Work**: Live streaming will play a central role in the future of remote work and online education, especially as hybrid work and e-learning models become more common.

VIII. CONCLUSION

Extensive COCO dataset, comprising a vast array of images. Through rigorous experimentation and testing, it has become evident that the system exhibits an exceptional level of accuracy in identifying objects within a variety of settings, be it indoors or outdoors. This high level of accuracy holds immense promise for improving the quality of life for visually impaired individuals. Moreover, the commercial viability of this system opens doors for widespread adoption

and accessibility. By making it commercially available, we can ensure that the visually impaired community can easily access and benefit from this innovative solution. In conclusion, the proposed system has the potential to significantly improve the lives of visually impaired individuals by offering them a reliable and highly accurate tool for object detection and identification, thereby promoting greater independence and inclusivity in their daily activities.

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