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Smart Helmet Data Streaming

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ABSTRACT

The world is progressing towards modernity and people are becoming smarter.Today, the impact of technology in our lives is immeasurable and one of the greatest examples of modern technology is Smart Helmet Data Streaming which could be the light at the end of the tunnel. A smart helmetis a type of protective headgear used by the user(worker) which not only protects the user but also has certain smart functionalities like recording a video. Themain purpose of this helmet is to provide video surveillance. This can be implementedby using ESP32-CAM and Arduino which can be streamed on a website. This makes it a smart helmet. ESP32-CAM comes with an OV2640 camera and provides an onboardTF card slot. The ESP32-CAM can be widely used in intelligent IoT applications such as wireless video monitoring, Wi-Fi image upload, QR identification, and so on. Which can be used widely for detecting crime, monitoring scenarios and activities,gathering evidence, arriving at the right decisions and maintaining records. Critical surgeries require to be broadcasted to a wider staff and students as a means for engaging, real-time learning. Live streaming can deliver high quality videofrom the OR to various users and devices. The literature survey done for the same is mentioned in further parts of the report. Around 7 IEEE papers have been referred tofor the study and framing of the problem statement. Loopholes amongst the papers or future work mentioned in them provisioned theproject with gap identification and thus tryingto resolve the same.

Keywords: *ESP32-CAM, Arduino UNO, Video Streaming, Website, Smart Helmet*

1. INTRODUCTION

The first rule of technology used in any business is to apply automation to efficient operations to increase efficiency. Second, applying automation to inefficient operations increases inefficiency. In addition to newly developed technologies, the security of systems equipped with these technologies is also becoming important. Security is especiallyimportant in systems with live, continuous dataflows. For example, systems with real-time data flows such as images and videos are becoming more important. To enhance security there is often a need for transmission of video and image data. For that purpose, we have developed a website where users can see live video streaming by using ESP32 CAM on our website.

Our project work is useful in a variety of fields, such as educational institutions, offices,the military, the medical field, mines and otherplaces where automation and monitoring are of utmost importance.

'Smart helmet' is a POC intended for the betterment of a person driving a bike. Mentioned in the report are the exact goals to be fulfilled by this project is to surveillancethe video capture by the camera fitted the ESP-32. From this video surveillancing, the data captured by the camera can be stored or monitored by a person . Also it will save the risk of accidents because accidents can be predicted by using this. The researcher canalso study the impact of various algorithms onvarious data.

The system design part provides an end to endidea of what exactly the project would look like. It also mentions the overall architecture of the project and other aspects of software engineering.

Live streaming can deliver high quality video from the OR to various users and devices. Critical surgeries require to be broadcasted toa wider staff and students as a means for engaging, real- time learning. The literaturesurvey done for the same is mentioned in further parts of the report. Around 7 IEEEpapers have been referred to for the study and framing of the problem statement. Loopholes amongst the papers or future work mentioned in them provisioned the project with gap identification and thus trying to resolve thesame. We then moved to the software requirements part where the things necessary to develop the project were understood, studied and tried to accomplish.

Project implementation states the overall algorithms used, the equations formed for the project that will yield better results. Also the tools and technologies used or the platforms and environments worked in have been specified.

2. LITERATURE SURVEY

- Surveillance Monitoring Using Esp32-cam Module by Dr.p.d. Selvam, K. Nikhil, K.Ranjitha Reddy, A. Mounika, P. Reddy Sekhar,: M. Reddy Siva Sai- The subject of this project isan intelligent visual surveillance system. Nowadays, security cameras are used to monitorand record the moment, but manual monitoring and real-time monitoring are one of the most important and difficult areas of computer vision widely used in people's lives, such as is. B. Security Monitoring. The presence of surveillance cameras and warning signs indicating that the area is being monitored can greatly deter criminals and thieves, as recorded footage can be used to identify individuals and track their activities.

- Cloud Based Surveillance using ESP32 CAM Akwinder Kaur, Abhimanyu Jadli, ApratimSadhu, Satvik Goyal, Abhishek Mehra, Rahul, Dept. of Computer Science & Engineering, Chandigarh University, Mohali, Punjab, India: This paper is based on cloud based ESP32 CAM. From communities to security guards to police to CCTV to drones, the idea of surveillance has always been around. Only updated from time to time. These days, the incorporation of artificial intelligence into surveillance and cloud surveillance is changing the methods and efficiencies. This work includessimilar surveillance techniques aimed at detecting people not wearing masks.

- This project was an inspiration to prepare for thecurrent pandemic situation and the future. This work also includes cloud monitoring and streaming of live video to servers. Convolutional neural networks have been developed to predict whether someone is wearing a mask. It is deployed on self-created servers and can be monitored remotely. The camera used for video recording is ESP32. This proposed work has been very well received globally given the current situation and may be exploited in the future.

- Internet of Things Based Home Monitoring and Device Control Using Esp32 V. Pravalika, Ch. Rajendra Prasad July 2019 International Journal of Recent Technology and Engineering 8(1S4):58-62 : This author uses ESP32 to enhance security and uses IP connectivity over local Wi-Fi to create a low-cost device with access and remote control of the device by authorized users using an Android smartphone application. introduces a flexible andreliable home monitoring and control system. The system is self-managed by servers and leverages the Internet of Things to control devices in human need, from industrial machines to consumer goods. The home monitoring and device control system not only reduces human effort, but also saves energy and time. To demonstrate the effectiveness and feasibility of this system, ahome surveillance system with ESP32 modules is introduced here. Users can monitor various conditions in their homes, such as room temperature, gas leaks, water level in tanks, human detection, etc., remotely control various devices such as lights, fans, motors, gas knobs, etc. You can make decisions based on feedback.

3. METHODOLOGY

1. **ESP32 Hardware:** The Methodology is to firstimplement the ESP32 hardware and connect it to Wi-Fi. Once the ESP32 is able to connect to the Wi-Fi, it can stream the video. Also, the hardware to turn ON the bluetooth mode is to be implemented by using a switch. Through thebluetooth mode, the user can change the Wi-Fi the Smart helmet is connected to.

2. **Website:** The next step is to create a website for all Smart Helmet related tasks. Through thiswebsite the user can login or sign up. It contains links to help if the user requires any.

3. **Android App:** Then, the next step is to create an Android Application using the MIT AppInventor tool through which the user can interact with the Smart Helmet. This app contains the option to Turn ON or OFF thecamera and also to connect with ESP32 viaBluetooth. Once the smartphone connects with the Smart Helmet, the user can type in the Wi-Fi credentials in the fields provided in the App. Once the user types in the credentials, after pressing 'Enter', the Smart Helmet will connect to the particular Wi-Fi. The user can then start streaming again.

4. **Stream on Website:** Finally, add the link to which the ESP32 streams into the website, so that users can click on the link and can directly view the stream.

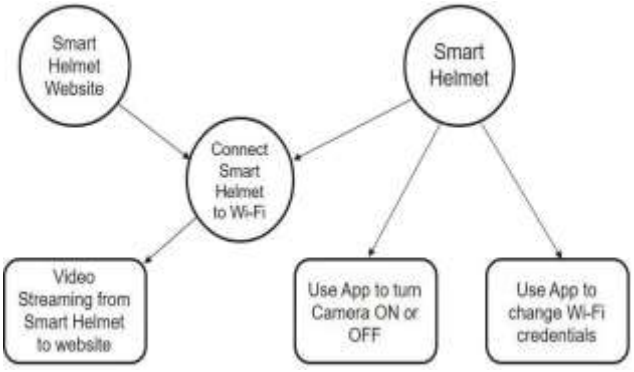

Figure 1 Block Diagram for smart helmet datastreaming

4. RESULT ANALYSIS AND DISCUSSION

The main goal of smart helmet data streaming is to monitor efficiently,for the safety, detection purpose and for industrial processes. This can help to monitor, improvesafety, and increase overall competitiveness for businesses that use these systems.

Some common applications for smart helmet data streaming include coal Miners, for any vehicle rider , for doctors and industrial uses. For example, every year, millions of patients die or are seriously injured due to doctors medical negligence. To reduce that kid of negligence this project is mosthelpful.

5. CONCLUSION

Today, in this world, technology is everywhere and used almost by everybody. This smart helmet helps the supervisor best alternative to monitor their worker. It will provide transparency between supervisorand workers. It also helps workers to be safe as helmets are very essential in places such as coal mines, military, motorcycle, etc.

6. REFERENCES

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