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A Review Desgin and Development of Virtual Monitoring System

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ABSTRACTS:

Parenting is a complex task that requires continuous supervision and monitoring to ensure the well-being and safety of children. However, in today's fast-paced world, parents often face challenges in providing round-the-clock monitoring due to various commitments. To address this issue, we propose the design and development of a virtual monitoring system from a parenting perspective. The virtual monitoring system leverages modern technologies such as artificial intelligence (AI), Internet of Things (IoT), and computer vision to create a comprehensive and interactive monitoring platform. It aims to empower parents by providing real-time insights into their child's activities, ensuring their safety.

The system consists of multiple components, including smart sensors, wearable devices, and a Raspberry Pi 3 .The smart sensors are strategically placed throughout the house to capture relevant data, such motion detection. The collected data is processed using AI algorithms, which analyse patterns and detect anomalies. This enables the system to identify potential risks or emergencies and alert parents promptly through a web interface (E-mail). Additionally, the computer vision technology is utilized to monitor video feeds and provide visual cues about the child's activities and surroundings.The advancement of technology has led to the development of various monitoring systems that offer convenience, flexibility, and enhanced security. One such system is the virtual monitoring system that utilizes Raspberry Pi and PIR (Passive Infrared) sensors. This literature survey aims to explore the existing research and developments related to the design and development of a virtual monitoring system using Raspberry Pi and PIR sensors. The survey focuses on identifying the different aspects of system design, sensor integration, data processing, and applications in various domains.

Keyword: Raspberry Pi, Internet of Things, Security, PIR Sensor, WEB camera, Iot

I .INTRODUCTION:

In today's digital age, ensuring the safety and well-being of children has become a primary concern for parents. To address this need, the design and development of a virtual monitoring system can provide parents with a comprehensive tool to monitor their children's online activities and overall security. This document outlines the key components and considerations for designing such asystem. Parents often face challenges in monitoring their children's activities and ensuring their safety. To address this issue, this project proposes the design and development of a virtual monitoring system that provides parents with a real-time view of their child's activities. The system utilizes Raspberry Pi, a low-cost single-board computer, and a Passive Infrared (PIR) sensor to detect movement and trigger the monitoring process.

II. LITERATURE REVIEW:

Implementation of Home Security Motion Detector Using Raspberry Pi and PIR Sensor,Amir Hifzan Azhar1, Mohd Fairuz Iskandar Othman1, Nazrulazhar Bahaman1,Mohd Zaki Mas'ud1 and Zurina Sa'aya11Fakulti Teknologi Maklumat dan Komunikasi (FTMK), Universiti Teknikal Malaysia Melaka.

The RAD approach is a software design technique that addresses the inflexibility of traditional software development models. Unlike traditional models where modifications are challenging after the initial development, RAD emphasizes adaptability and the incorporation of new features and functionalities at every stage of the development process. It allows for easier changes and accepts new inputs during development.

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Passive Infrared (PIR) Sensor Based Security System
Article · June 2013

PIR-Based Security System:The proposed security system utilizes a PIR sensor to detect changes in infrared radiation caused by warm-blooded moving objects within its range. The sensor's output voltage changes correspondingly, Information regarding capturing and sending images via Wi-Fi, PuTTY configuration steps, or installing Raspbian OS**.**

Smart Motion Detection System Using Raspberry Pi,Venkat Margapuri Department of Computer Science Kansas State University Manhattan, USA
Based on capturing an image and sending it using Wi-Fi, it involves the process of capturing a digital image using a camera or a similar device and then transmitting that image wirelessly using a Wi-Fi network. This technology enables the quick and convenient transfer of images from one device to another without the need for physical connections or cables.

SMART SURVEILLANCE MOINTERING SYSTEM BY USING RASBERRY PI AND PIR, SENSOR, SANJANEPARSAD, P.MAHALAXMI, AUGUST 2019

Visit the official Raspberry Pi website and download the latest version of Raspbian OS (now known as Raspberry Pi OS) in the form of a disk image file.Prepare the MicroSD Card: Insert the MicroSD card into your computer and use an appropriate tool to format it. Ensure you have sufficient storage capacity for the Raspbian OS.
take effect. Raspbian OS is now installed on your Raspberry Pi, and you can start using it for various projects and applications.Please note that this summary provides a general overview of the steps involved in Putty configuration and Raspbian OS installation and may not include all the details and variations that may exist.

III.SYSTEM OVERVIEW:

The virtual monitoring system consists of three main components: the Raspberry Pi, the PIR sensor, and a web-based user interface. The Raspberry Pi serves as the central processing unit, responsible for capturing images and processing the data. The PIR sensor detects any motion within its range and sends a signal to the Raspberry Pi, initiating the monitoring process. The web-based user interface allows parents to access the live video feed and control the system remotely. The virtual monitoring system aims to provide parents and this signal is amplified to trigger the activation of a webcam and lighting system through a relay. A software application installed on a computer captures and records video when the webcam is turned on. When an intruder enters the PIR sensor's detection range, it activates the lighting system and the webcam. The software then detects the webcam connection.Unfortunately, the text does not provide

Flash the Raspbian Image: Use a disk imaging tool like Etcher to write the downloaded Raspbian OS image file onto the Micro SD card. This process will create a bootable SD card with Raspbian OS.Insert the Micro SD Card: Once the flashing process is complete, eject the MicroSD card from your computer and insert it into the Raspberry Pi device.Power Up the Raspberry Pi: Connect the power supply to the Raspberry Pi to power it up. The boot process will begin, and the Raspbian OS will be installed automatically.Set up the Operating System: Follow the on-screen prompts to set up the initial configuration of Raspbian OS, including language preferences, Wi-Fi settings, and password setup.Update and Upgrade: After the initial setup, it is recommended to update the Raspbian OS to the latest version. Open a terminal window and run the following commands:
sudo apt-get update
sudo apt-get upgrade

Install Additional Packages (Optional): You can install additional software packages and libraries as per your requirements using package managers like apt or pip.Reboot the Raspberry Pi: Once the updates and installations are complete, reboot the Raspberry Pi for the changes to with real-time insights into their children's online behaviour, while respecting their privacy and maintaining a secure environment. The system will encompass both hardware and software components, enabling monitoring across various devices and platforms.Develop comprehensive reports and analytics tools that summarize the collected data, allowing parents to gain insights intotheir children's online behaviour patterns and identify potential risks.Once the Raspberry Pi captures images or videos, it processes them to reduce file size and optimize storage. The processed data can be stored locally on the Raspberry Pi's SD card or transferred to a remote server for long-term storage. Encryption and secure transfer protocols can be implemented to ensure the privacy and security of the data,Web-Based User Interface:The web-based user interface provides parents with access to the live video feed and control over the monitoring system. Parents can log

in to the interface using their credentials and view the real-time video stream from the Raspberry Pi. Additionally, they can remotely start or stop the monitoring process, adjust camera settings, and receive alerts or notifications based on predefined condition.

IV.CONCLUSION:

The design and development of the virtual monitoring system using Raspberry Pi and a PIR sensor offers parents a convenient solution to monitor their children's activities remotely. With the ability to access live video feeds and control the system through a web-based interface, parents can ensure their child's safety and well-being even when physically apart. The system can be further enhanced with additional features like facial recognition, object detection, or integration with other smart home devices, based on specific requirements and preference.

REFERENCE:

[1]. H. Gu, D. Wang, "A content-aware fridge based on RFID in smarthome for homehealthcare," in: Adv. Commun. Technol. 2009.ICACT 2009. 11th Int. Conf., Phoenix Park, 2009, pp. 987–990.

[2]. Thinagaran Perumal, Chui Y.L, Mohd Anuaruddin Bin Ahmadon,Shingo Yamaguchi. " IoT Based Activity Recognition amongSmart Home Residents". 2017 IEEE 6th Global Conference onConsumer Electronics (GCCE 2017).

[3]. Ruochen Lu, Tomas Manzaneque, Michael Breen, Anming Gaoand Songbin Gong. "Piezoelectric RF Resonant VoltageAmplifiers for IoT Applications". International Conference onEnergy, Communication, Data Analytics and Soft Computing(ICECDS-2017).

[4]. Dr. M.L. Ravi Chandra, B. Varun Kumar, B. Sureshbabu. " IoTEnabled Home With Smart Security". International Conferenceon Energy, Communication, Data Analytics and Soft Computing(ICECDS-2017).

[5]. Sneha S. Mane,Girish R. Talmale. "Raspberry Pi Based Security System on IoT Platform". International Conference on RecentTrends in Engineering Science and Technology (ICRTEST) 2017.

[6]. jinhee Han, yongsung Jeon, jeongnyeo Kim. "SecurityConsiderations for Secure and Trustworthy Smart Home Systemin the IoT Environment". 978-1-4673-7116-2/15 ©2015 IEEE.

[7]. Implementation of Home Security Motion Detectorusing Raspberry Pi and PIR Sensor, Amir Hifzan Azhar1, Mohd Fairuz Iskandar Othman1, Nazrulazhar Bahaman1,Mohd Zaki Mas'ud1 and Zurina Sa'aya11Fakulti Teknologi Maklumat dan Komunikasi (FTMK), Universiti Teknikal Malaysia Melaka.

[8]. Passive Infrared (PIR) Sensor Based Security SystemArticle · June 2013

[9]. Smart Motion Detection System Using Raspberry Pi ,Venkat Margapuri Department of Computer Science Kansas State University Manhattan, USA

[10]. SMART SURVEILLANCE MOINTERING SYSTEM BY USING RASBERRY PI AND PIR SENSOR,SANJANEPARSAD,P MAHALAXMI,AUGUST 2019