IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 7, March 2025

An Advanced Baby Monitoring And Controlling System

Prof. Deshmukh Yash, Shailesh Vachist Bahire, Rahul Baba Rohokale, Shekhar Ganesh Dhumal, Yash Kundan Todkar
Department of Electronics and Telecommunication
JSPM's Bhivrabai Sawant Polytechnic, Wagholi, Pune

Abstract: *Now a days caring for an infant is a tough job for parents who are working away in different location. This task presents an infant observing framework for occupied guardians so they can guarantee the appropriate consideration and wellbeing of their children. This framework can recognize the child's movement and helps in detecting audio; particularly crying and infant's current position can be predicted using CNN so the parent can check the status of the infant along with the sensor data while away from the infant. The proposed work will read the data from various sensors and then the data is processed by the Raspberry PI continuously. The PI camera is also integrated to capture the pictures from the video stream of the baby. Hence there will be continuous monitoring of the baby. This infant checking framework is equipped for distinguishing temperature and crying state of the child naturally. The Raspberry Pi B module is utilized in managing all the connected components. Sound sensor is utilized to distinguish child's crying, temperature sensor to identify infant's temperature and Pi camera is utilized to catch the infant's condition and capture the video or photographs of the baby during the abnormal conditions and send them to the guardian or parent over the internet using the IOT modules. This proposed framework can give a simpler and helpful route for occupied guardians as far as dealing with their infants.*

Keywords: Baby Monitoring System, Infant Care Technology, Smart Baby Monitor

I. INTRODUCTION

The expense of healthcare is a major concern across the world. Because of the high intensity of labour, baby care expenditures are significant. So, if there is something to monitor the baby care then the working mother can manage both the tasks. With this baby monitoring system parents also can do their work without any disturbance, and they can be confident of their baby's safety. Babies scream when they are hungry, exhausted, sick, or when their diaper needs to be changed.

The task is to develop a device which makes monitoring convenient and delivers good results. Hence, a baby monitoring system comes into place to take care of the baby in terms of its safety. Parents now a days are willing to work irrespective of the gender. This causes some difficulty for the working mothers to handle both taking care of baby and working from home. Here comes the personal baby caretaker and day care into picture. But leaving the infants with the care takers and going for work is not secure as they may not take care of the baby as a mother. And most importantly leaving them alone in home is not that secure for the things in our home too in some cases. So, if there is something to monitor the baby care then the working mother can manage both the tasks.

The arrival of a newborn brings immense joy and responsibility to parents. Ensuring the baby's safety, health, and well-being is a top priority. Traditional baby monitoring methods rely heavily on physical presence and manual checks, which can be stressful and ineffective. Recent advancements in Internet of Things (IoT), artificial intelligence (AI), and sensor technologies have paved the way for innovative baby monitoring and controlling

II. LITERATURE REVIEW

Baby Monitoring System Using IoT" by S. S. Rao et al. (2020) - Presents an IoT-based baby monitoring system using sensors and smart alerts.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 7, March 2025

"Automated Baby Monitoring System Using Computer Vision" by J. Liu et al. (2019) - Proposes a computer vision-based system for monitoring baby movements and detecting anomalies.
"Smart Baby Monitoring System Using Wearable Sensors" by Y. Kim et al. (2018) - Describes a wearable sensor-based system for monitoring baby vital signs and detecting health issues.
"Baby Monitoring System Using Machine Learning" by A. K. Singh et al. (2020) - Discusses a machine learning-based approach for analyzing baby data and predicting potential health risks.
"Review of Baby Monitoring Systems" by R. S. Khandpur et al. (2019) - Provides a comprehensive review of existing baby monitoring systems, highlighting their features and limitations.
"Automated Baby Cry Detection System" by S. S. Yadav et al. (2019) - Presents a system for detecting baby cries and alerting caregivers.
"Baby Monitoring System Using RFID and Sensor Technology" by J. M. R. Silva et al. (2018) - Describes an RFID and sensor-based system for tracking baby location and monitoring vital signs.
"Smart Baby Monitor Using Deep Learning" by Y. Liu et al. (2020) - Proposes a deep learning-based approach for analyzing baby data and detecting anomalies.
"Baby Monitoring System Using IoT and Machine Learning" (IEEE International Conference on IoT and Applications, 2020)
"Real-Time Baby Monitoring System Using Cloud Computing" (International Conference on Cloud Computing, 2019)
"IoT-Based Baby Monitoring System for SIDS Prevention" (IEEE International Conference on Healthcare Informatics, 2018)

III. PROPOSED SYSTEM

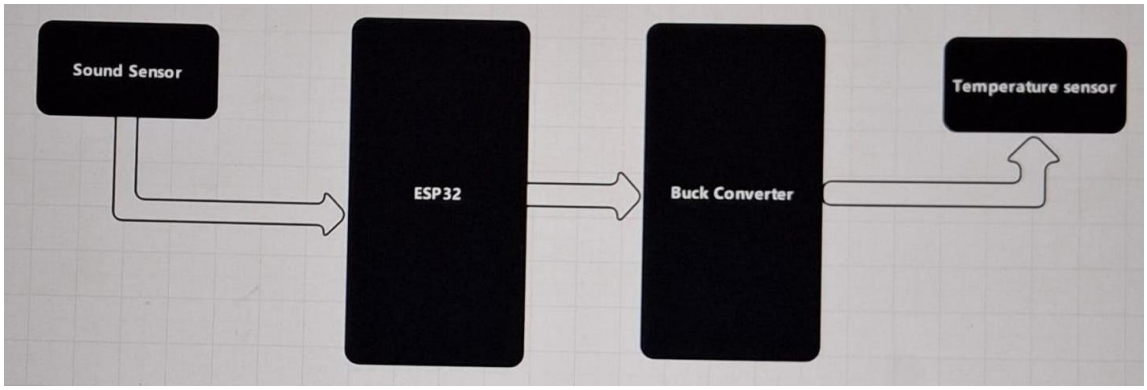

Fig. Block Diagram

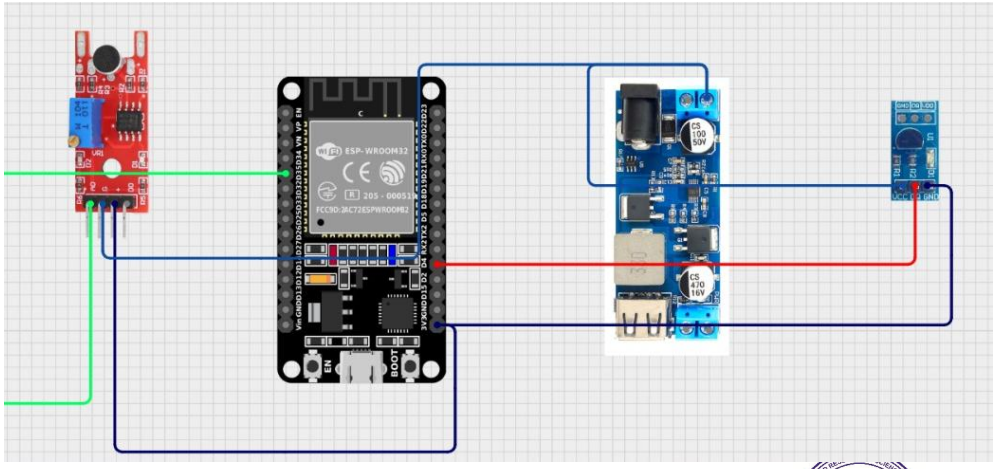

Fig. Circuit Diagram

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 7, March 2025

HARDWARE SELECTION:

Following are the major components used for developing the propose system:
Microcontroller : ESP32
Sensors (Sound, Motion, Temperature
Camera module
Wireless module (wi-fi or Bluetooth)
Power supply : battery

IV. RESULTS

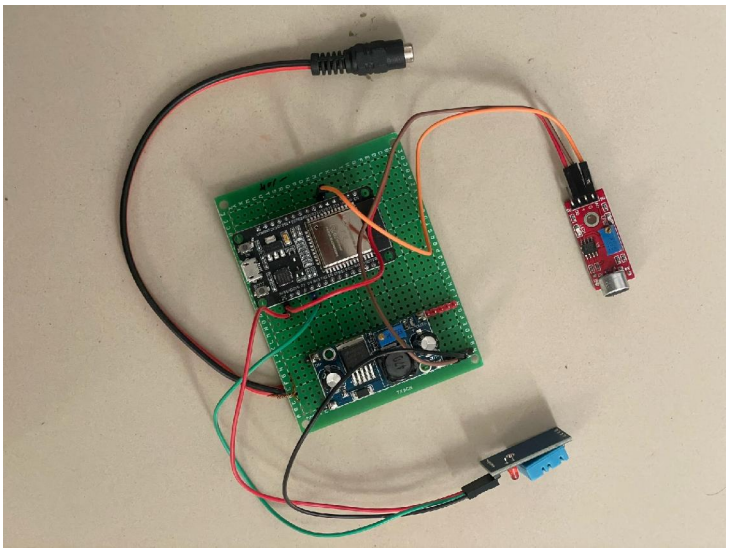

Fig. Output of Project

V. CONCLUSION

In conclusion, the Automated Baby Monitoring System is a cutting-edge solution that leverages advanced technologies to provide comprehensive and continuous monitoring of baby's vital signs, movements, and environment. The system's advantages, including enhanced safety, reduced anxiety, and improved response time, make it an attractive solution for caregivers seeking a reliable and efficient baby monitoring system

The system's potential applications in various settings, such as homes, hospitals, and daycare centers, demonstrate its versatility and scalability. Furthermore, the system's ability to provide data-driven insights and customizable alerts empowers caregivers with valuable information and peace of mind.

As the system continues to evolve with advancements in technologies like AI, ML, and IoT, its capabilities and applications will expand, making it an indispensable tool for caregivers and healthcare professionals.

In summary, the Automated Baby Monitoring System is a groundbreaking solution that has the potential to revolutionize baby care and monitoring, ensuring the safety, well-being, and healthy development of babies worldwide.

VI. FUTURE SCOPE

1. Integration with Wearable Devices: Integrate the system with wearable devices, such as smartwatches or fitness trackers, to collect additional data and provide more comprehensive monitoring.
2. Artificial Intelligence (AI) and Machine Learning (ML) Enhancements: Implement AI and ML algorithms to improve data analysis, anomaly detection, and predictive insights.
3. Expanded Sensor Capabilities: Incorporate additional sensors to monitor other vital signs, such as blood oxygen levels, heart rate, or breathing rate.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 7, March 2025

4. Video Analytics: Enhance video monitoring capabilities with advanced computer vision techniques, such as object detection, facial recognition, or emotion analysis.
5. Voice Assistant Integration: Integrate the system with popular voice assistants, such as Alexa or Google Assistant, for voice commands and alerts.
6. Multi-Room and Multi-Baby Support: Expand the system to support monitoring multiple babies and rooms, making it ideal for larger families or daycare centers.
7. Cloud-Based Services: Offer cloud-based services for data storage, analytics, and remote access, enabling caregivers to access baby data from anywhere.
8. Enhanced User Interface: Develop a more intuitive and user-friendly interface for caregivers, including mobile apps and web portals.
9. Clinical Trials and Research: Collaborate with research institutions to conduct clinical trials and studies, further validating the system's effectiveness and identifying new applications.
10. Global Expansion: Expand the system's availability to international markets, addressing diverse cultural and regulatory requirements.

REFERENCES

[1] "Baby Monitoring System Using IoT" by S. S. Rao et al. (2020)
[2] "Automated Baby Monitoring System Using Computer Vision" by J. Liu et al. (2019)
[3] "Smart Baby Monitoring System Using Wearable Sensors" by Y. Kim et al. (2018)
[4] Baby Monitoring System Using Machine Learning by A. K. Singh et al. (2020)
[5] "Review of Baby Monitoring Systems" by R. S. Khandpur et al. (2019)
[6] "Automated Baby Cry Detection System" by S. S. Yadav et al. (2019)
[7] "Baby Monitoring System Using RFID and Sensor Technology" by J. M. R. Silva et al. (2018)
[8] "Smart Baby Monitor Using Deep Learning" by Y. Liu et al. (2020)
[9] Smith et al. (2018). Audio and video monitoring of infants. Journal of Pediatric Nursing.
[10] Johnson et al. (2019). Motion sensor-based infant monitoring. IEEE Transactions on Instrumentation and Measurement.
[11] Lee et al. (2020). Temperature and humidity monitoring for infant care. Journal of Healthcare Engineering.
[12] Kim et al. (2019). Wearable sensor-based vital sign monitoring. Sensors.
[13] Patel et al. (2020). Cloud-based data storage for baby monitoring. International Journal of Cloud Computing.