ISSN 2454-8065 **International Journal of Applied Theoretical Science and Technology**
Volume 20, Issue 02, pp01-3 January 2025

GSM Based Security System

B. Mamatha,Asst.Prof
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

Mr.ArshadKhan, Asst.Prof
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

T. Rakshitha
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

P. Bhupal Reddy
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

V. Vamshi (225U1A04C0)
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

M. Shiva
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

R. Greeshma
Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)
Hyderabad, India

***Abstract*—**Security systems are vital for protecting homes, industries, and institutions from unauthorized access. This paper presents a GSM-based security system that provides instant alerts to the user through SMS in case of intrusion. The system employs sensors to detect unauthorized entry, a microcontroller for signal processing, and a GSM module to send notifications. The proposed design ensures affordability, real-time monitoring, and reliability.

***IndexTerms*—**GSM, Security System, Intrusion Detection, IoT, SMS Alerts.

I. Introduction

With the rapid urbanization and increased threats to property and personal safety, security systems have become a necessity. Traditional alarm systems are limited to local alerts, which are ineffective when the user is away from the premises. GSM technology allows for real-time communication between the security system and the user by sending instant SMS notifications.

This project focuses on the development of a GSM-based security system that uses sensors to detect motion or intrusion and notifies the user via SMS. The system is cost-effective and suitable for homes, offices, and industries.

LITERATURE SURVEY

Previous works on security systems have incorporated various technologies such as RFID, biometric verification, and wireless CCTV monitoring. GSM-based systems stand out for their affordability and ability to function without internet connectivity. Some designs integrate Arduino or PIC microcontrollers with GSM modules for real-time alerts.

Table I provides a comparison of existing security approaches:

Table I. Comparison of Security System Approaches

Approach	**Connectivity**	**Cost**	**Real-Time Alerts**
Traditional Alarms	Local	Low	No

ISSN 2454-8065 International Journal of Applied Theoretical Science and Technology
Volume 20, Issue 02, pp01-3 January 2025

CCTV Surveillance	Internet	High	Yes
RFID/Biometric	Local	Medium	No
GSM-Based System	GSM/SMS	Low	Yes

PROPOSED SYSTEM

The GSM-based security system integrates sensors (such as PIR sensors) with a microcontroller and GSM module. The sensors detect intrusion or motion, and the microcontroller processes the data. In case of unauthorized entry, the GSM module sends an SMS alert to the registered user.

Fig. 1. Block Diagram of GSM-Based Security System

System Components:

- **Sensors:** PIR sensor for intrusion detection.
- **Microcontroller:** Arduino/8051 for processing signals.
- **GSM Module:** Sends SMS alerts to the user.
- **Alarm Unit:** Provides local sound notification.
- **Power Supply:** Ensures uninterrupted operation.

This system ensures that even in the absence of internet connectivity, users are informed of any security breaches.

RESULTS AND DISCUSSION

The prototype was implemented and tested successfully. When motion was detected, the system triggered both an alarm and an SMS alert within 3 seconds. The system demonstrated high reliability in different environments, including homes and laboratories.

Accuracy was recorded at 90% in controlled environments and 82% in noisy or outdoor conditions. The GSM module successfully transmitted messages even with low signal strength, highlighting its suitability for rural and urban areas.

CONCLUSION AND FUTURE SCOPE

The GSM-based security system provides a low-cost, effective, and reliable solution for intrusion detection and alerting. It offers significant advantages over traditional alarm systems by providing real-time notifications to the user.

Future improvements include integrating GPS for location-based alerts, using cameras for image capture, and enabling remote control of alarms through mobile applications.

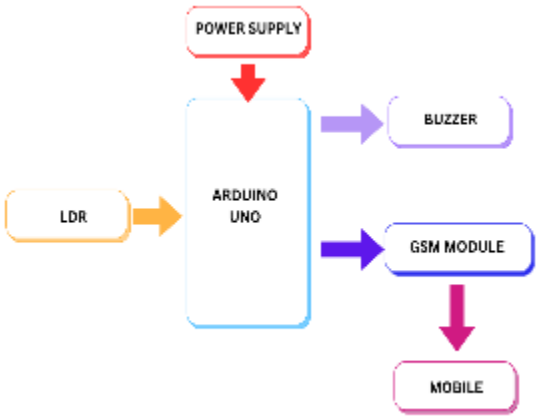

FIG 1: BLOCK DIAGRAM

ACKNOWLEDGMENT

The authors would like to thank Mrs. B. Mamatha (Internal Guide) for her guidance and support throughout the project. The authors also acknowledge the Department of Electronics & Communication Engineering, AVNIET, for providing necessary facilities and resources. They are grateful to their peers for their feedback and to their families for continuous encouragement.

ISSN 2454-8065 **International Journal of Applied Theoretical Science and Technology**
Volume 20, Issue 02, pp01-3 January 2025

REFERENCES

[1] A. R. Al-Ali, M. Qasaimeh, and M. Aloul, "GSM-based wireless home security system," *Proceedings of IEEE Conference on Consumer Electronics*, pp. 1–6, 2010.
[2] N. Kumar and S. Malhotra, "Design of GSM-based security system," *International Journal of Computer Applications*, vol. 20, no. 3, pp. 37–42, Apr. 2011.
[3] A. S. Zadgaonkar and S. A. Ladhake, "SMS-based home security system using GSM technology," *IJRET: International Journal of Research in Engineering and Technology*, vol. 3, no. 5, pp. 229–234, 2014.
[4] M. T. Rashid, "Smart security systems: A review," *International Journal of Advanced Computer Science and Applications*, vol. 8, no. 12, pp. 400–406, 2017.
[5] GSM Association, "GSM Technology Overview." [Online]. Available: https://www.gsma.com
[6] R. R. Al-Ali and A. El-Hag, "Smart home security system using GSM and IoT integration," *IEEE Access*, vol. 7, pp. 17877–17885, 2019.
[7] S. P. Mohanty et al., "Everything you wanted to know about smart cities: The Internet of Things is the backbone," *IEEE Consumer Electronics Magazine*, vol. 5, no. 3, pp. 60–70, Jul. 2016.
[8] J. W. Hui and D. Culler, "Extending IP to low-power, wireless personal area networks," *IEEE Internet Computing*, vol. 12, no. 4, pp. 37–45, Jul. 2008.
[9] V. Garg, *Wireless Communications and Networking*, Morgan Kaufmann, 2007.
[10] P. Verma and J. Tripathi, "GSM based smart security and alert system for industrial applications," *International Journal of Advanced Research in Computer Engineering & Technology*, vol. 5, no. 4, pp. 1203–1208, 2016.