**SMART BANKING SECURITY USINGIR and LASER TECHNOLOGY**

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# ABSTRACT

# The project aims to revolutionize bank security and operational efficiency through the integration of advanced technologies. A comprehensive approach is adopted, comprising two main components: a sophisticated bank premises security system and an intelligent entry/exit management and environment control system.

# The bank premises security system utilizes laser diodes and Light Dependent Resistors (LDRs) to establish a formidable perimeter defense. Laser beams emitted by strategically positioned diodes form an impenetrable barrier, while LDRs promptly detect and alert against any intrusion, ensuring swift resnonse to potential threats.Integrated GSM modules provide real-time alerts to predefined numbers, enhancing security measures.

# The entry/exit management and environment control system streamline visitor management and optimize internal environmental conditions. Infrared (IR) sensors accurately count entries and exits, enabling efficient monitoring and ensuring no individuals remain inside the bank. Light intensity is intelligently controlled based on LDR readings, optimizing energy usage, while temperature and humidity sensors autonomously regulate air conditioning, ensuring occupant comfort.

# Additionally, the project incorporates DHT11 sensors to monitor temperature and humidity levels, providing further insights into the internal environment.

# This data is utilized to control the operation of fans, ensuring optimal air circulation and enhancing comfort for occupants.This project represents a holistic solution to modern bank security and operational challenges, offering adaptability, scalability, and seamless integration of cutting-edge technologies to create a safe, efficient, and comfortable banking environment.

# INTRODUCTION

# In an era characterized by technological advancements and evolving security needs, the banking sector stands at the forefront of innovation to safeguard assets and enhance operational efficiency. Traditional security measures, such as physical barriers and manual surveillance, are being augmented and, in many cases, replaced by sophisticated systems that leverage the power of automation and real-time monitoring.

# This paper presents a comprehensive project aimed at redefining bank security and operational excellence through the integration of state-of-the-art technologies.

# The project encompasses two primary components: a cutting-edge bank premises security system and an intelligent entry/exit management and environment control system.

# The bank premises security system utilizes advanced laser diodes and Light Dependent Resistors (LDRs) to establish a robust perimeter defense mechanism. Laser beams emitted by strategically positioned

# diodes create an impenetrable barrier, while LDRs promptly detect any intrusion, triggering immediate alerts to relevant stakeholders via integrated GSM modules. This system not only enhances the bank's security posture but also provides real-time situational awareness and response capabilities. Complementing perimeter security system is an innovative entry/exitmanagement and environment control system. Infrared (IR) sensors accurately count entries and exits, enabling efficient visitor management and ensuring the safety of individuals within the bank premises. Light intensity is intelligently regulated based on LDR readings, optimizing energy consumption, while temperature and humidity sensors autonomously adjust air conditioning, maintaining optimal environmental conditions for occupants.

# Furthermore, the project integrates DHT11 sensors to monitor temperature and humidity levels, enabling precise control over fan operation to enhance air circulation and occupant comfort. This holistic approach not only addresses security concerns but also prioritizes the well-being and comfort of individuals within the bank environment.

# By combining cutting-edge technologies with meticulous design and implementation, this project represents a paradigm shift in bank security and operational management. It offers adaptability, scalability, and seamless integration, thereby setting new standards for safety, efficiency, and customer experience in the banking sector.

# OBJECTIVE

The project aims to develop an advanced security and operational management system for banking environments. It focuses on enhancing security through the integration of laser diodes and Light Dependent Resistors (LDRs) to establish a robust perimeter defense mechanism, ensuring prompt detection and alerting against unauthorized intrusions. Additionally, the system streamlines visitor management using Infrared (IR) sensors for accurate entry/exit counting, providing real- time insights into occupancy levels.

Integration of temperature and humidity sensors enables autonomous regulation of air conditioning systems, optimizing environmental comfort and energy efficiency. Real-time monitoring and alerting capabilities via GSM modules ensure timely response to security breaches and environmental anomalies. The project prioritizes user-friendly interfaces and scalable architecture to set new standards for bank security, operational efficiency, and customer experience.

# COMPONENTS REQUIRED

* Arduino Uno
* Arduino Nano
* GSM Module with SMS support
* Laser Diode
* LDR Sensor
* Buzzer
* Resistors
* SIM Card
* IR Sensor
* LCD
* DC Motor
* Jumper wires
* DHT 11 Sensor
* LEDs
* Power supply
* Breadboard

# LITERATURE SURVEY

[1] Laser based security system using Arduino UNO by Paramitha Mondal, Madhusree Mondal. The proposed system contains sensor, Arduino UNO, ESP Wi-Fi module, buzzer, LDR module. In this system once security system detects the intruder buzzer starts buzzing very loudly, spy camera takes the photo of the intruder and sends it to the registered email address for valid proof.

[2] Laser based security system for home by Harshal Hemane, Debarati Sen. In this proposed system mirrors are used to reflect the laser rays to cover the region surrounding home in all direction. When laser light is incident on a mirror, it gets reflected from one mirror to another and falls on LDR. If any of the laser ray is blocked the buzzer produces beep sound.

[3] Laser security alarm system by A.B.N.V. Prasad, K. Ravi Raj, K. Siva Ganesh, M. Lithin Siva swamy Naidu, N.Phaneendra. In this project based on the voltage drop across the LDR is considered to turn On and Off the transistor. If the voltage drop across the LDR is low transistor is turned Off, if the voltage across the LDR is high transistor is said to be turned On. Once the transistor is turned on buzzer produces beep sound.

[4] Laser security system by Debarati Dutta. The proposed system contains LDR, IC555, transistor, buzzer which gives alert that the intruder has entered the monitored entrance through beep sound.

[5] Kadam Shah, Prakash Savaliya and Mitesh Patel "Automatic Room Light Controller With Bidirectional Visitor Counter" (LUICTRD) International Journal of ICT Research and Development | Vol-1 Issue-4 ISSN: 2395-4841.

bidirectional visitor counter,The main objective is to count the number of people entering into the bank and counting the number of people taking bank services physically and to protect bank from theft so that it will display the count of people who were remained in the bank.This whole process is operated totally automatically by using its sensors.

[6] Sushma Verma, Arpita Das, Subham Dey, Parijat Chowdhury, Automatic Temperature Controlled Fan Using Thermistor, ISSN:2321-1156 International Journal of Innovative Research in Technology & Science(UIRTS) http://ijirts.org/volume4issue4/IJIRTSV414002.pdf

By this research paper we figure out the basic elements for automatic controlled devices using DHT11 sensor and gathered information about it.

[7] Vikas Vats and Upendra Kumar, Speed control of fan Based on room temperature by using programmable logic controller International Journal of Recent Scientific Research Vol. 6, Issue, 4, pp.3537-3539,April,2015,

http://www.recentscientific.com/sites/default/files/2270.pdf.

By this research paper we gathered the most relevant information about the conservation of energy by controlling the gadgets which works according to their respective temperature.

[8] Bai Y. and Ku Y. (2008), Automatic Room Light Intensity Detection and Control using Microprocessor and Light Sensors. IEEE International Symposium on Consumer Electronics 54: 1173-1176.

By this Research paper we gathered information about the usage of lights when needed and to eradicate the wastage of electricity "conservation of electricity".

# CONCLUSION

In conclusion, the implemented project seamlessly integrates cutting-edge technology to fortify the security and operational efficiency of a bank environment. The innovative bank premises security system, employing laser diodes and Light Dependent Resistors (LDRs), establishes a formidable perimeter defense.

This system not only detects but promptly alerts against any unauthorized intrusion, ensuring the safety of the bank's assets.

Complementing this, the entry and exit management system, coupled with intelligent environmental control mechanisms, creates a comprehensive solution. Accurate visitor counting, lighting optimization based on ambient conditions, and autonomous climate control through temperature and humidity sensors collectively enhance security, energy efficiency, and occupant comfort within the bank.

The project's adaptability, real-time alerting capabilities, and modular design contribute to its versatility and scalability, making it a robust solution for evolving security and operational requirements.

By seamlessly amalgamating security, visitor management, and environmental control, this project represents a holistic approach to creating a smart and secure banking environment.

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