

DEVELOPMENT OF IOT – BASED RODENT GUARD USING ELECTRIC SHOCK TRAP SYSTEM

PRODUCT DESCRIPTION

This project aims to develop an IoT-based smart rodent trap system that integrates modern technology for effective pest control. Utilizing an Arduino board, IR sensors, a servo motor, a relay, a buzzer, and a Wi-Fi module, the system is designed to detect and capture rodents humanely. It delivers a timed electric shock to immobilize the rodent and allows users to customize settings such as alert preferences, and operating hours via the Blynk app. The system provides real-time notifications and real-time sensing capabilities, enhancing convenience and ensuring timely intervention. Overall, the project seeks to offer a sustainable, humane, and efficient solution to rodent infestations in urban environments and agricultural sites.

INTRODUCTION

In human habitats, pests like brown rats pose significant challenges due to habitat overlap, property damage, and disease transmission. With their rapid reproduction rates, these species become serious pests that we must control and prevent from invading our properties. Traditional pest control methods relying on pesticides have shown detrimental environmental impacts, exemplified by the case of DDT. Consequently, there's a growing imperative for greener, safer, and smarter pest management solutions. This poster introduces an innovative approach: the IoT-Based Rodent Guard with Electric Shock Trap System, aimed at addressing rodent infestations while prioritizing ecological sustainability.

PROBLEM STATEMENT

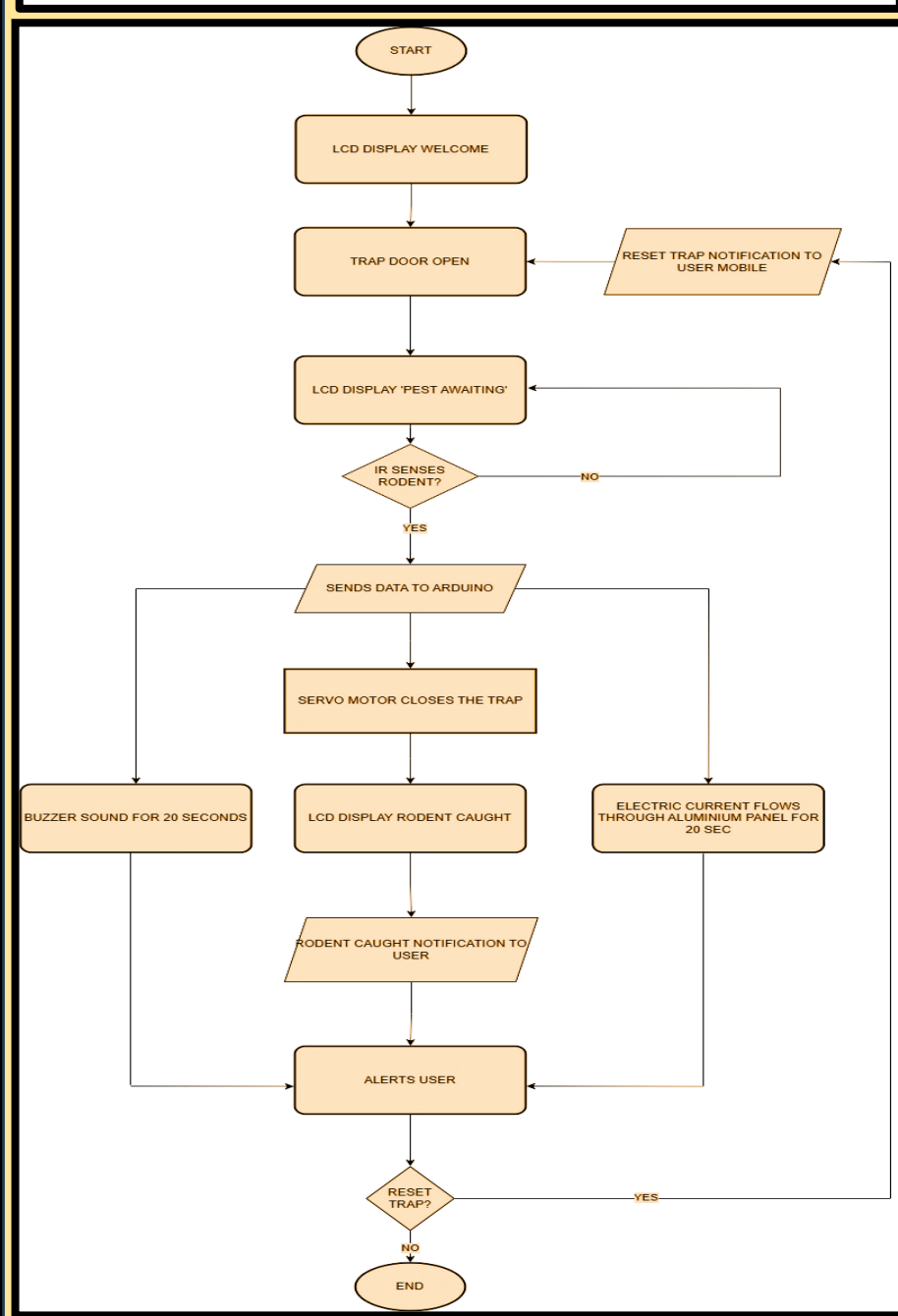
1. Environmental Impact: Traditional pest control harms wildlife and ecosystems, as evident in past disasters like DDT. We need eco-friendly alternatives.
2. Health Risks: Rodents spread diseases; damage properties and due to their extremely high reproduction rates, current methods may not much effective and ensure no safety for humans and non-target species.
3. Sustainable Solutions: Demand is rising for greener, safer pest control. We need innovative methods to manage rodents while protecting the environment.

OBJECTIVE

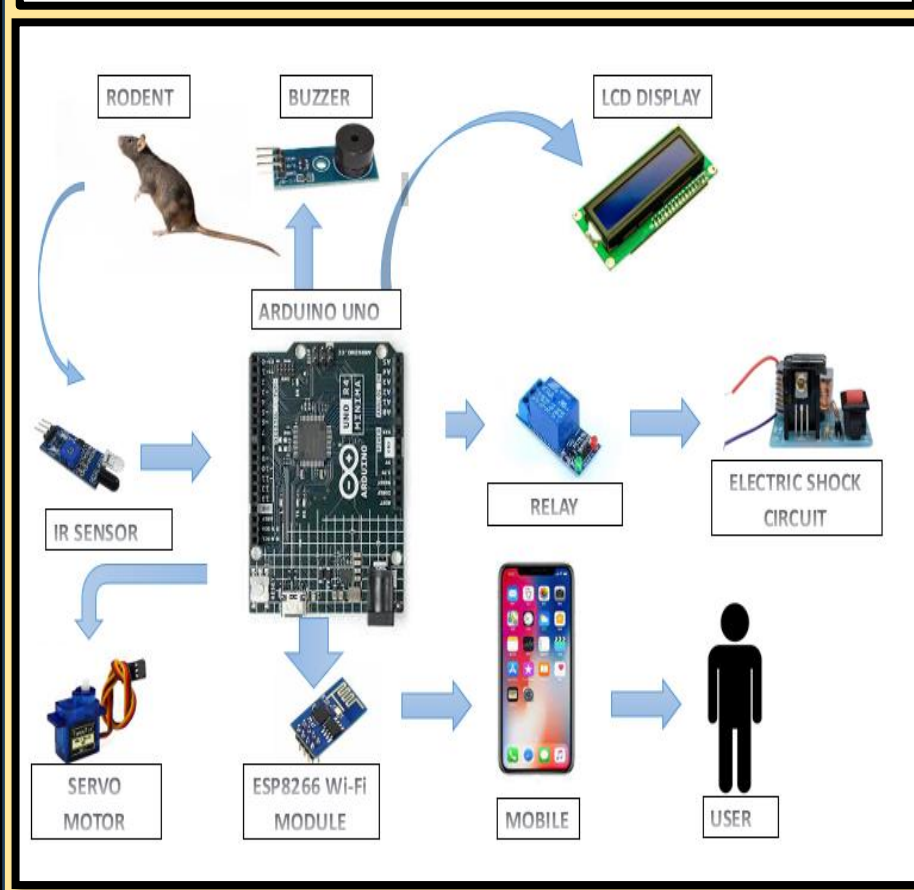
- To develop an integrated automated smart rodent trap system using IoT (Internet of Things) and Smart Systems to detect and capture rodents.
- To design a system that triggers precise commands from the Arduino to activate the relay delivers a timed electric shock.
- To provide real-time notifications and real-time continuous sensing of the rodent status.

METHODOLOGY

Flow Chart



Block Diagram

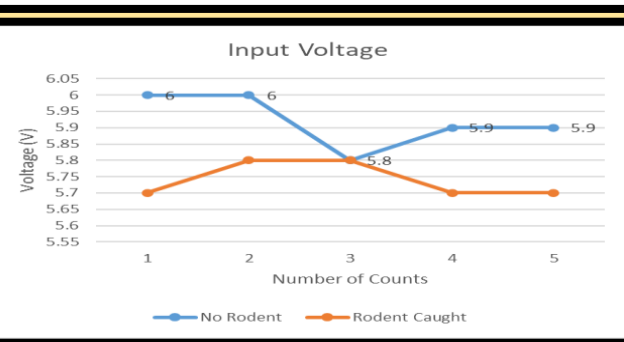


RESULT AND ANALYSIS

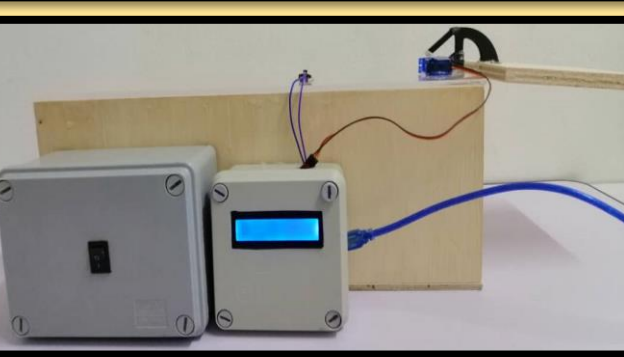
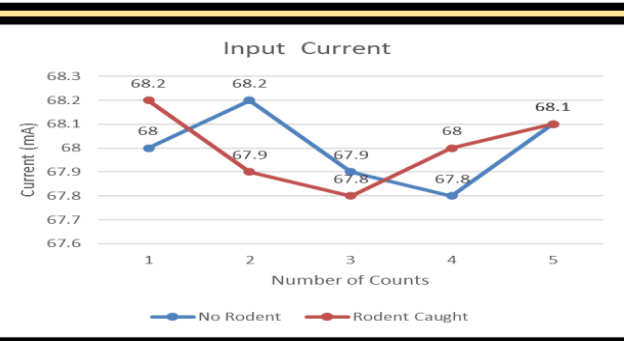
Performance and Functionality of the IoT-Rodent Guard system

No.	Scenario	STATUS	FIGURES
1.	Rodent Not Caught	Trap Door: Open	
		LCD Display: Pest Awaiting	
		Electric Shock: Off	
		Buzzer: Sound Off	
		Blynk Notification: No Notification	
2.	Rodent Caught	Trap Door: Closed	
		LCD Display: Pest Caught	
		Electric Shock: On (20 seconds)	
		Buzzer: Sound on (20 seconds)	
		Blynk Connection: 'Pest Caught' Notification	

Input Voltage Over Rodent Status Graph



Input Current Over Rodent Status Graph



PROJECT POTENTIAL

- Urban Setting: The equipment can be utilized in an urban setting where rodent infestation exists, such as at agriculture sites, restaurants, and warehouses.
- Research Applications: The technology enables researchers to humanely collect and study rats outside the labs and artificial environments.
- Smart Home Integration: It can be integrated into the smart home system, to give a wholesome pest control solution along with other smart devices at home.

PROJECT FEATURE

- Infrared (IR) sensors accurately detect the presence of rodents, triggering the system to activate.
- Relay delivers a timed electric shock to immobilize the rodent humanely.
- Users can receive instant notifications about trap status and rodent capture events.
- The system can be deployed in various settings, including homes, agricultural sites, and commercial properties.

CONCLUSION

The Development of IoT-Based Rodent Guard Using Electric Shock Trap System has successfully achieved its primary objectives as effectively detects and captures rodents using an Arduino board, IR sensor, a servo motor, a relay, a buzzer and a Wi-Fi module. By triggering precise commands from the Arduino to activate the relay, it delivers a timed electric shock, ensuring efficient and humane rodent control. Additionally, the system provides real-time notifications and continuous sensing of rodent status, enhancing user awareness and control. This innovative approach demonstrates a significant advancement in rodent management, offering a sustainable, effective, and user-friendly solution.

REFERENCES

- F. Ozaydin, V. Mwaffo, and P. Candidates, "5643 final project SMART MOUSE TRAP," 2012.
- Yusman, A. Finawan, and Rusli, "Design of wild animal detection and rescue system with passive infrared and ultrasonic sensor based microcontroller," *Emerald Reach Proceedings Series*, vol. 1, pp. 415–422, 2018, doi: 10.1108/978-1-78756-793-1-00042.

