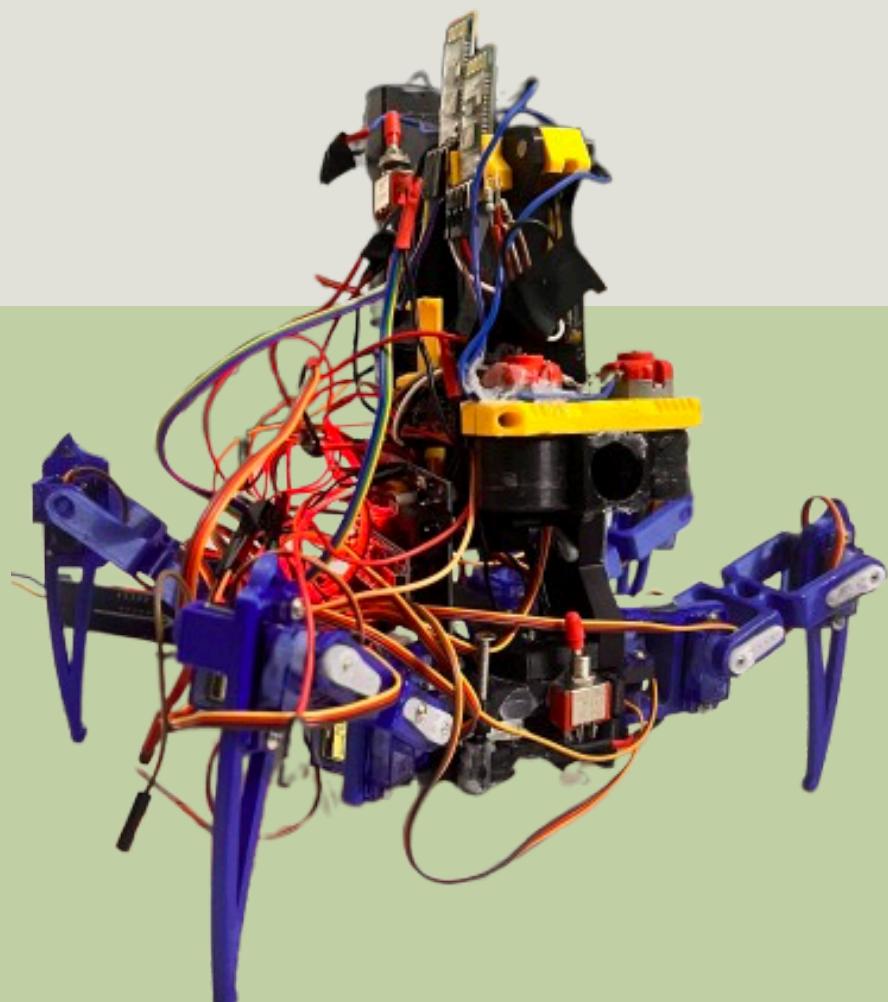


# PROJECT REPORT

## COMBAT SPIDER BOT



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# ABOUT US

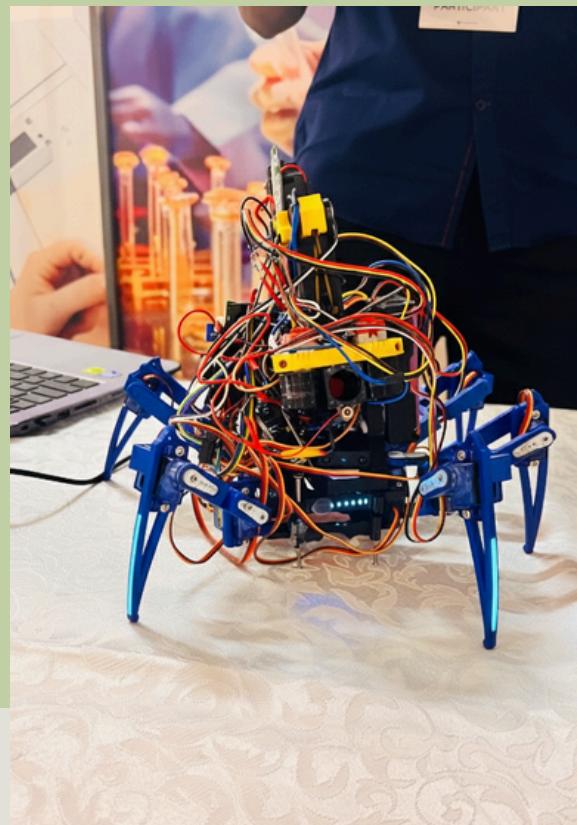
We are a team of passionate student innovators with a strong interest in robotics, automation, and emerging technologies. Our focus is on designing practical, hands-on projects that combine electronics, programming, and mechanical systems into working prototypes. Through the Combat Spider Bot project, we aim to showcase creativity, technical skills, and problem-solving abilities while exploring advanced concepts in modern robotics and intelligent systems.

## Bringing true intelligence to motion.

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The Combat Spider Bot represents our approach to hands-on learning and innovation. Inspired by biological movement, the robot uses a multi-legged structure to achieve stability, flexibility, and precise control on different surfaces.

By integrating sensors, wireless communication, and a camera-based monitoring system, the project demonstrates how modern robotics can be applied to surveillance, defense concepts, and advanced educational demonstrations.



**Figure: Combat Spider Bot prototype**

## Why this project ?

This project was developed to explore advanced robotic movement and intelligent control systems through hands-on experimentation and real-world implementation. The Combat Spider Bot demonstrates how mechanical design, embedded electronics, and software control can be combined into a single functional robotic platform. By using spider-style locomotion, the project highlights improved stability and adaptability compared to traditional wheeled robots. It also reflects the potential of multi-legged robotic systems in surveillance, research, and advanced educational applications.



## ABOUT OUR PROJECT

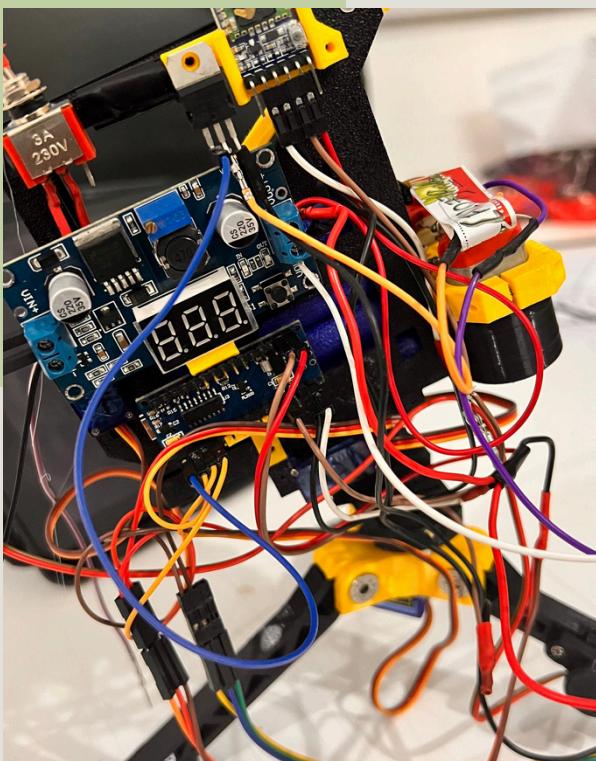
The Combat Spider Bot is a multi-legged robotic system designed to demonstrate advanced movement, surveillance, and remote-controlled targeting. Inspired by spider locomotion, it uses synchronized servo motors for stable movement on uneven surfaces. The project combines electronics, programming, and mechanical design to showcase practical robotics applications.

## OUR MISSION

- To design and develop an advanced robotic system that demonstrates real-world applications of robotics, automation, and embedded systems through hands-on learning, innovation, and practical experimentation.
- To inspire curiosity and technical interest in emerging technologies such as defense robotics, surveillance systems, and intelligent machines by converting theoretical knowledge into a reliable, functional, and scalable robotic prototype.

## OVERVIEW

The Combat Spider Bot is an Arduino-based multi-legged robotic system designed for stable movement, remote surveillance, and controlled targeting. It uses 12 servo motors for spider-style locomotion, ultrasonic sensors for obstacle detection, Bluetooth for wireless control, and a rotating turret with camera support for real-time monitoring. Its modular design allows future upgrades such as autonomous navigation and AI-based vision, making it a scalable and advanced robotics prototype.

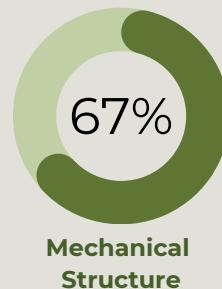


## PROGRESS OF OUR PROJECT

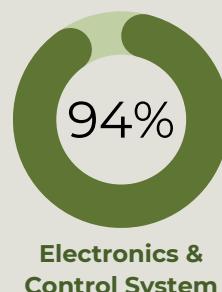
The Combat Spider Bot has been developed through multiple phases, starting from basic movement control to advanced feature integration. Initial stages focused on servo calibration and leg coordination, followed by the integration of ultrasonic sensors and Bluetooth communication. Continuous testing and optimization were carried out to improve movement stability, power efficiency, and response accuracy.

Our progress reflects the development of the Combat Spider Bot, from mechanical design to full system integration and testing.

The development process involved designing the mechanical structure, assembling the servo-driven legs, integrating sensors, and programming coordinated movement patterns. Each stage was tested and refined to ensure stability, accuracy, and reliable performance during operation.



The spider leg structure and turret mount have been assembled, with ongoing servo alignment and gait optimization to improve balance and movement.



The Arduino-based control system, sensors, Bluetooth module, and power management have been integrated and tested, with reliable wireless control and sensor feedback.

The project involved challenges such as servo coordination and power stability, which were resolved through testing and optimization. This process improved our understanding of embedded systems, sensor integration, and wireless control. The key innovation lies in combining spider-style locomotion with intelligent sensing and control in a compact robotic platform.