

EASWARI ENGINEERING COLLEGE

(Autonomous)

Bharathi Salai, Ramapuram, Chennai – 600 089



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROJECT PROPOSAL

TNSDC – Naan Mudhalvan Anna University - Nirai Thiruvizha (Hackathon)

EVEN Semester 23-24

Project Mentor

Ms. S Suruthi
Assistant Professor/ECE

Submitted by,

1. Allwin Meshach Hezron T (310620106012)
2. Bhuvaneshwaran L (310620106021)

AUTONOMOUS FIREFIGHTING DRONE

1. **Major Area:** Smart Town/City

2. **Problem statement**

How might we create an innovative drone system utilizing AI for automatic human detection in disaster situations, generating alarms, and efficiently dropping payloads, integrating technologies like cameras, processors, and payload mechanisms.

3. **Total Cost:** 10,000/-

4. **College Code & College Name:** 1306 & Easwari Engineering College

5. **Guide Name, Designation, Mobile No. & Email id:**

Ms. S Suruthi, Assistant Professor, 9884490910, suruthi.s@eec.srmrmp.edu.in

6. **Student Team details:**

S. No	Reg No	Name	Branch	Phone no	Email ID
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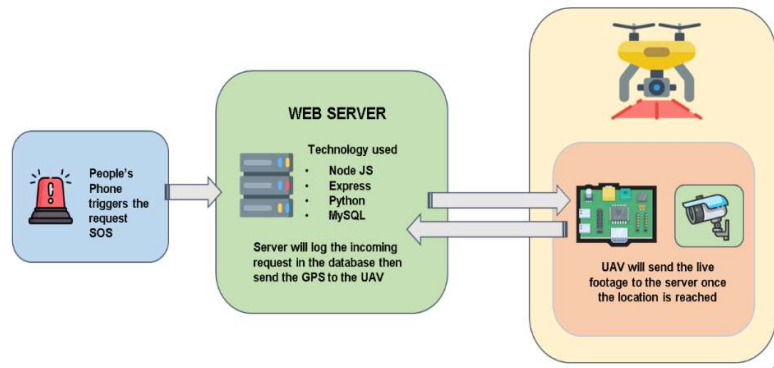
7. **Project Summary:**

Create an AI enabled drone in automatic detection of human movements in disaster situations. The AI-enabled drone project focuses on the automatic detection of human movements in disaster situations to enhance emergency response efforts. Equipped with advanced sensors, cameras, and AI algorithms, the drone can autonomously navigate disaster-stricken areas, identify survivors, and assess damage. Its major use cases include search and rescue operations, post-disaster assessment, monitoring hazardous environments, communication relay in damaged areas, surveillance, humanitarian aid delivery, and preventative monitoring of disaster-prone regions. Technology significantly improves response efficiency, speed, and safety, ultimately aiding in saving lives and minimizing the impact of disasters on affected communities. Primarily, it plays a crucial role in search and rescue operations, swiftly scanning disaster-stricken areas to locate survivors where human access may be challenging. In the aftermath of natural disasters like earthquakes, floods, or hurricanes, the drone aids in identifying survivors, assessing damage, and prioritizing rescue efforts. Similarly, in man-made disasters such as industrial accidents or large-scale fires, the drone assesses the situation, monitors disaster spread, and identifies high-risk areas.

8. Proposed solution with methodology:

To design an autonomous drone system equipped with a camera and with AI for the automatic detection of human movements in disaster situations. The system aims to enhance search and rescue operations, post-disaster assessment, and overall disaster response capabilities.

Methodology:



A drone equipped with a **compatible flight controller** is seamlessly integrated with a Raspberry Pi (RPI), acting as an onboard computer. The **Raspberry Pi** is configured to establish communication with the flight controller and serve as a bridge between the drone and a background server. A server is set up to receive, process, and store data transmitted from the Raspberry Pi. **Communication protocols, such as MQTT or HTTP**, are implemented to ensure secure and efficient data transfer. The Raspberry Pi collects telemetry data, including **GPS coordinates**, altitude, and sensor readings, and transmits it to the server for further analysis. On the server side, artificial intelligence (AI) models are integrated to perform real-time or batch analysis of the drone data. This can include tasks like object detection, path planning, or anomaly detection, depending on the project's objectives. The server also incorporates a **database system** for storing historical drone data, facilitating machine learning model training and analysis over time. The bidirectional communication between the server and the Raspberry Pi allows for real-time updates and commands. Additionally, security measures are implemented to protect data during transmission and storage. The **integrated system undergoes testing, calibration, and deployment in a controlled environment**, with continuous iterative improvements based on feedback and performance evaluations, ensuring a robust and scalable solution for various applications such as **real-time monitoring, analytics, and decision support**.

9. Workplan / time schedule indicating the project milestone:

AUGUST 2023- SEPTEMBER 2023	Back-end Web server creation
OCTOBER 2023- NOVEMBER 2023	Data communication –UAV –Server checking-Image processing
DECEMBER 2023-JANUARY 2024	UAV Building- Autonomous flight testing
FEBRUARY 2024- MARCH 2024	Path detection to GPS, Flying mode verification
APRIL 2024	Testing of crime surveillance application

10. List of facilities available in the college to develop the prototype of the project:

- Rf components in communication lab.
- CRO and other testing and analyzing tools.
- Robotics and Automation lab

11. Nature of Industry support for the project, (if any): None

12. Details of Financial assistance required:

Flight Controller	1000
BLDC motors	1000
Electronic Speed Controllers	450
Propeller Blades	350
Raspberry Pi 3	4000
Camera Module	1400
LIDAR sensors	450
14.8-volt Rechargeable LiPo Battery	500
UAV Frame	200
Battery Management System	150
GSM & GPS module	500
Total	10,000

13. Expected outcomes / results:

- AI drones can rapidly track and monitor human movements during disasters, facilitating quicker response times and aiding in locating individuals efficiently.
- The integration of AI algorithms with drone technology enhances situational awareness for emergency responders, providing real-time insights into the dynamic and complex nature of disaster-affected areas.
- AI-enabled drones contribute to improved safety and accuracy in tracking individuals during disasters, ensuring precise location data and enhancing the overall effectiveness of rescue operations.

UNDERTAKING

1. The college will provide the basic infrastructure and other required facilities to the students for timely completion of their projects.
2. The college assumes to undertake the financial and other management responsibilities of the project.
3. The college will ensure that the funds provided are utilized only for the purpose provided and any remaining amount will be returned back to the University after the time of completion of the project.

Signature of the Mentor

Signature and seal of the principal