SMART INDIA HACKATHON 2022

Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation: Ministry of Defence

PS Code: SIH1416

Problem Statement Title: AI based Automatic alarm generation and dropping of payload at a particular object through a Drone.

Team Name: AeroSolutions

Team Leader Name: Bhavin Baldota

Institute Code (AISHE): U-0888

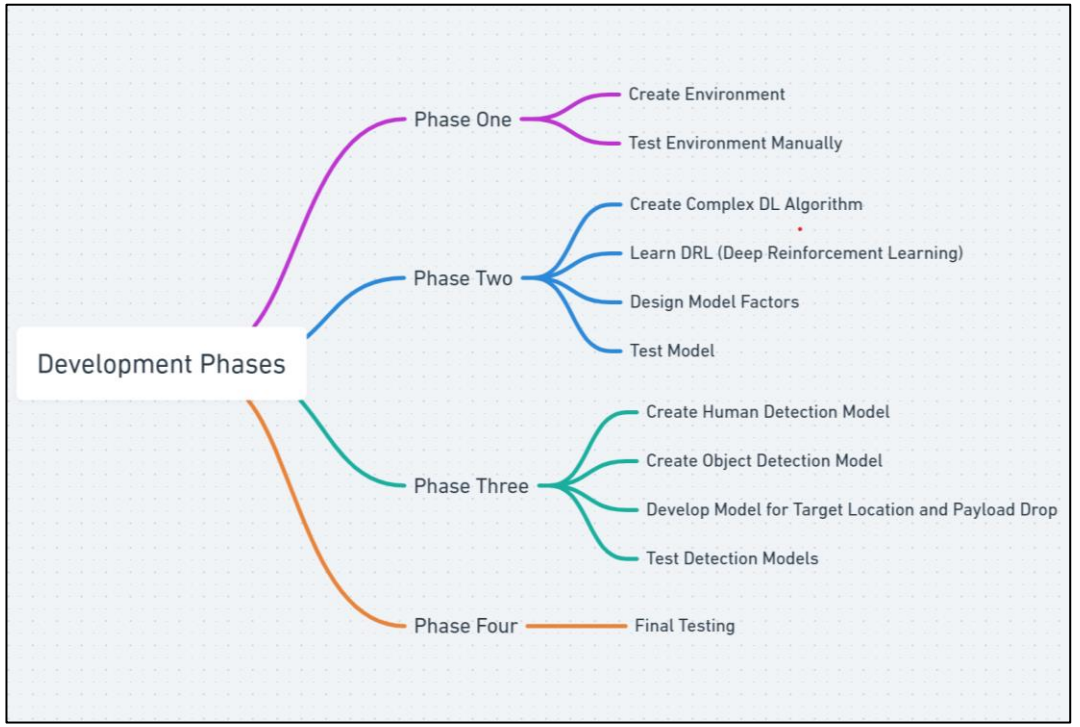
Institute Name: Vishwakarma University

Theme Name: Disaster Management

Idea/Approach Details

Solution Overview:

- Solution centers on using software and AI to revolutionize disaster response with drones.
- Integration of Unity, Deep Reinforcement Learning (DRL), and Deep Learning is key to system development.
- System automates drone flight and enhances object recognition capabilities.
- Technology is particularly beneficial in critical disaster scenarios like earthquakes and floods.
- Specialized in detecting humans from altitudes of 50-100 meters, even at slanted angles.
- Enables precise and targeted aid delivery through payload drops.
- Represents a significant advancement in leveraging technology to save lives and reduce disaster impact.



Technology stack:

- Drone Technology
- Cameras
- Artificial Neural Network or AI Hardware/Software
- Payload Dropping Mechanism
- Unity
- Deep Reinforcement Learning (DRL)
- Deep Learning
- Raspberry Pi

Idea/Approach Details

Use Cases:

- Disaster Response: Our software-centric solution plays a crucial role in disaster response scenarios, where rapid and accurate assistance is required. By automating drone flight and object recognition, we can provide immediate support during events like earthquakes and floods.
- Automatic Object Recognition: The system excels in recognizing and categorizing objects, particularly human beings, from a drone's perspective, even in challenging conditions.
- Payload Dropping: Once objects are identified, our software enables precise payload drops, which can include essential supplies like food, clothing, and rescue tools near the detected individuals.

Dependencies/Show Stoppers:

- Technical Challenges: Our solution faces several technical challenges, such as optimizing drone flight paths, fine-tuning the DRL algorithms, and ensuring accurate object detection in varying environmental conditions.
- Hardware/Software Dependencies: We rely on a combination of software and hardware components, including Unity, DRL frameworks, deep learning libraries, Raspberry Pi, and drone hardware. Ensuring seamless integration and compatibility among these elements is critical to success.
- Regulatory Compliance: Adhering to regulatory and safety standards for drone operations is paramount, and we must address compliance issues during development and deployment.

Team Member Details

Team Leader Name: Bhavin Baldota

Branch: Btech | Stream: Artificial Intelligence and Data Science | Year: III

Team Member 1 Name: Darshit Mehta

Branch: Btech | Stream: Computer Science | Year: III

Team Member 2 Name: Atharv Talathi

Branch: Btech | Stream: Computer Science | Year: III

Team Member 3 Name: Anuja Badve

Branch: Btech | Stream: Computer Science | Year: III

Team Member 4 Name: Dhruv Dhabalia

Branch: Btech | Stream: Artificial Intelligence and Data Science | Year: III

Team Member 5 Name: Havi Agarwal

Branch: Btech | Stream: Artificial Intelligence and Data Science | Year: III