Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation:
Ministry of Defence

PS Code: **1422**

Problem Statement Title: **Devise the method for identification of victims buried under avalanches**

Team Name: **Dexters#**

Team Leader Name: **Vishnuvasan T S**

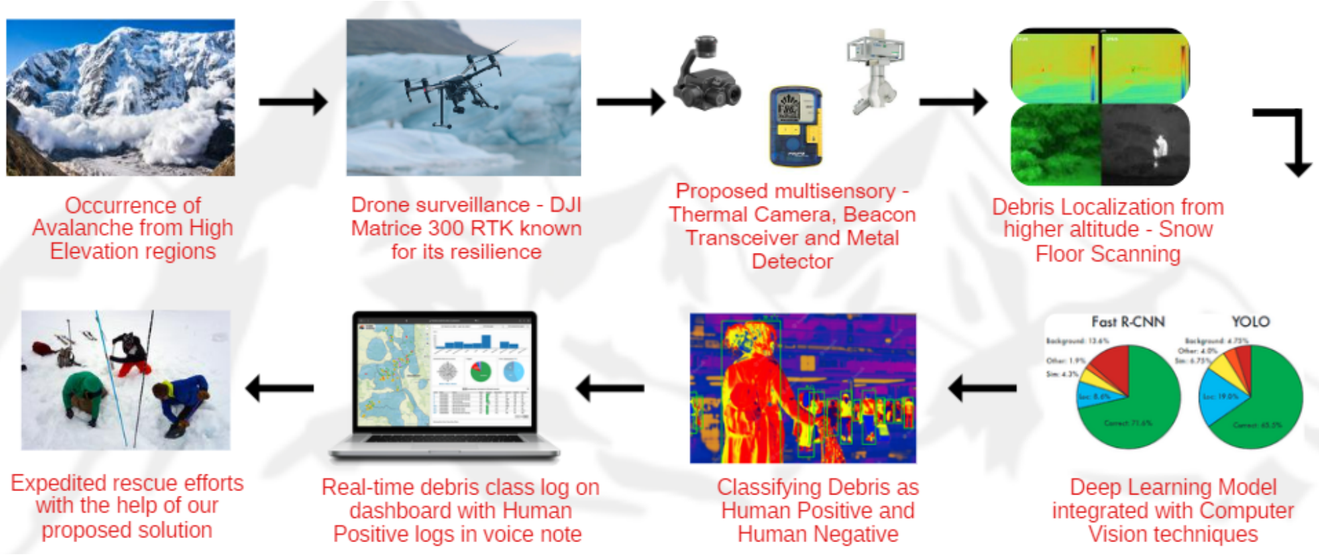
Institute Code (AISHE): **1-36531100771**

Institute Name: **Sri Venkateswara College of Engineering**

Theme Name: **Disaster Management**

Idea/Approach Details

- Novel *60-minute avalanche search plan*
- Aerial view from UAVs for faster examination
- Snow floor scanning through *Thermal Imaging*
- *Beacon Transceiver* and *Metal Detectors* as supporting parameters
- *Ensemble Learning* - YOLO V8, Mobile Net V3 and Fast R-CNN
- Victim localization with *latitude and longitude* in voice note from the dashboard
- *Debris landmark* for every victim to fasten the excavation process
- Interactive dashboard with all the embedded *real-time data*

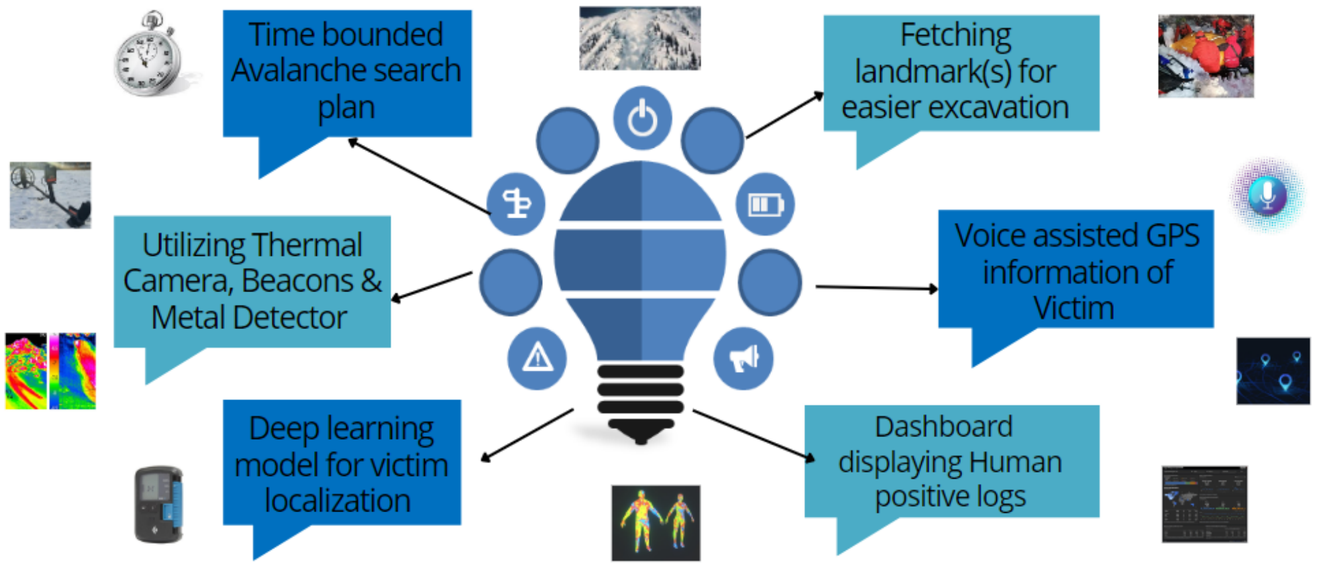


Tech Stack:

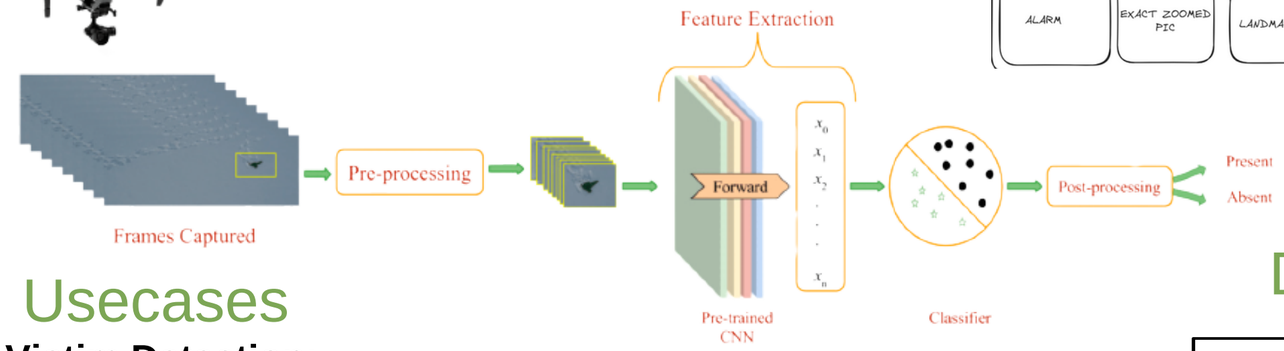
pyAudio Analysis

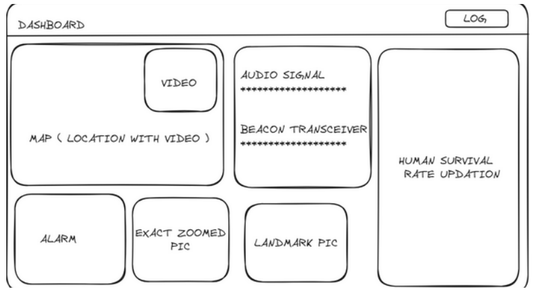
Flask

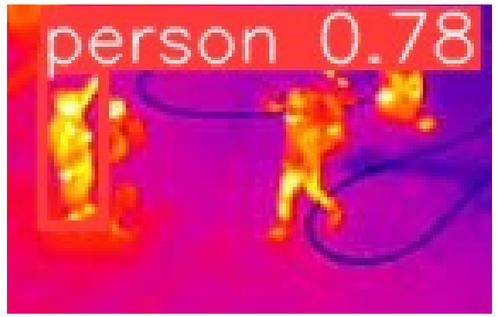
mongoDB



Idea/Approach Details







Usecases

Victim Detection:

- The drone's thermal imaging camera scans the avalanche debris for heat signatures, detecting potential victims beneath the snow.
- Beacon transceivers carried by potential victims emit signals, aiding in precise victim location.
- The metal detector system identifies any metallic objects that could be associated with victims, such as ski equipment.

Timely Rescue:

- Thanks to the advanced system, victims can be located accurately and quickly, increasing their chances of survival.
- Emergency services are informed about the location and number of potential victims.

Post-Operation:

- The system is evaluated for its performance, and any data collected during the operation is analyzed to improve future rescue efforts.

Dependencies / Show stopper

- DJI Matrice 300 RTK Drone: You'll need this specific drone model or a similar one with the necessary payload capacity and resilience for harsh conditions.
- Thermal Imaging Camera: Choose a high-quality thermal imaging camera compatible with the drone's payload and capable of capturing thermal data accurately.
- Beacon Transceivers: Acquire or develop beacon transceivers that emit detectable signals and integrate them with your system.
- Metal Detector System: Obtain or design a metal detector system suitable for your application and compatible with the drone.
- Data Processing and Analysis Software: Develop or use software to process and analyze data collected by various sensors on drone.
- Communication Equipment: Ensure reliable communication equipment is in place to transmit data from the drone to the operator and, if necessary, to emergency response teams.
- Extreme Weather Conditions: The project's success relies on the drone's ability to function in harsh avalanche conditions. If the drone is unable to operate effectively in extreme cold, wind, or heavy snow, it can be a major showstopper.

Team Member Details

Team Leader Name: **Vishnuvasan T S**
Branch: B Tech Stream: ADS Year: IV
Team Member 1 Name: **Rahul G**
Branch: B Tech Stream: ADS Year: IV
Team Member 2 Name: **Senajith S R**
Branch: B Tech Stream: ADS Year: IV
Team Member 3 Name: **Shanmathi V**
Branch: B E Stream: CSE Year: II
Team Member 4 Name: **Rashmika R S**
Branch: B Tech Stream: INT Year: II
Team Member 5 Name: **Raja Vishalini G**
Branch: B Tech Stream: INT Year: II
Team Mentor 1 Name: **K Srinivasan**
Category : Academic Expertise: ML, Cloud Computing Domain Experience: 11 years
Team Mentor 2 Name: **K Kiruthika Devi**
Category : Academic Expertise: ML, Computer Vision Domain Experience: 11 years