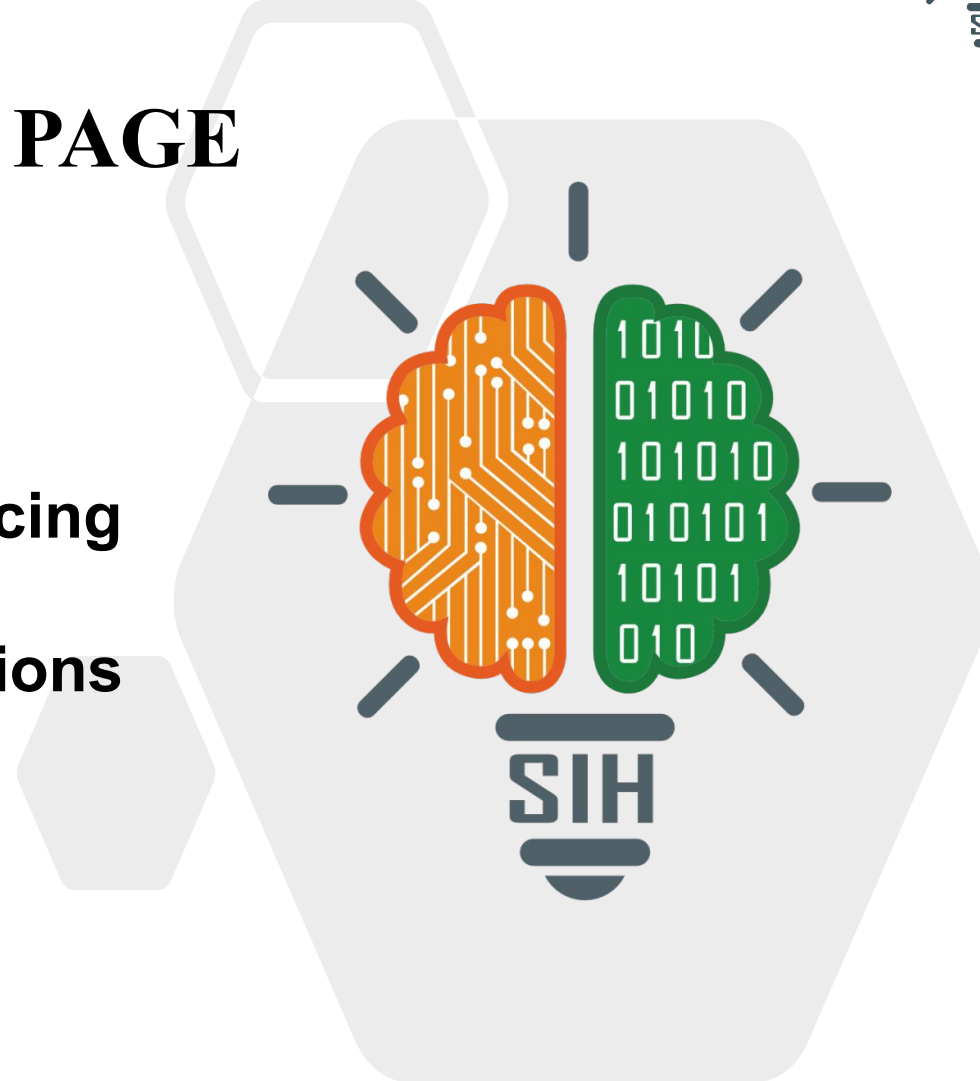


## TITLE PAGE

- Problem Statement ID – 1566
- Problem Statement Title- Enhancing  
body detection in CSSR Operations  
Using Advanced Technology
- Theme- Disaster Management
- PS Category-Hardware



# IDEA TITLE

## Idea/ Solution:

A **drone-based system with sensors and modules** will capture CSSR site data, sending it to a ground station to generate **3D visuals** with potential human presence spots, aiding NDRF's SAR operations.

- **Subsurface Imaging: GPR module** detects objects beneath rubble, revealing hidden structures or victims.
- **Heat Signature Detection: Thermal/IR/Multi-spectral imaging** identifies heat signatures, indicating possible human presence even in low visibility conditions.
- **Electronic Device Location:** RF radiation module locates electronic devices, estimating the number of people trapped.
- **Real-time Monitoring:** Onboard motion camera continuously tracks motion, providing vital information for rescue operations.

## Problem Resolution

- Drone **pinpoints human presence** under rubble with precision, **empowering NDRF teams**.
- Our drone revolutionizes SAR operations by **speeding up** the search for trapped individuals.
- Advanced drone modules **save time and lives** by rapidly locating trapped humans.

## Innovation and Uniqueness

- **Safer Search:** Drones reduce surface contact risk.
- **Informed Rescue:** 3D visuals aid navigation planning.
- **Accurate Count:** RF radiation detects trapped individuals.
- **Hazard Alert:** Gas sensors ensure safe rescue

## Algorithms Development:

OpenCV, TensorFlow, PyTorch, VTK [Visualization ToolKit] - Core Technologies used for 3D visualization, Machine Learning, Data Analysis and Computer Visions

## Hardware Implementation:

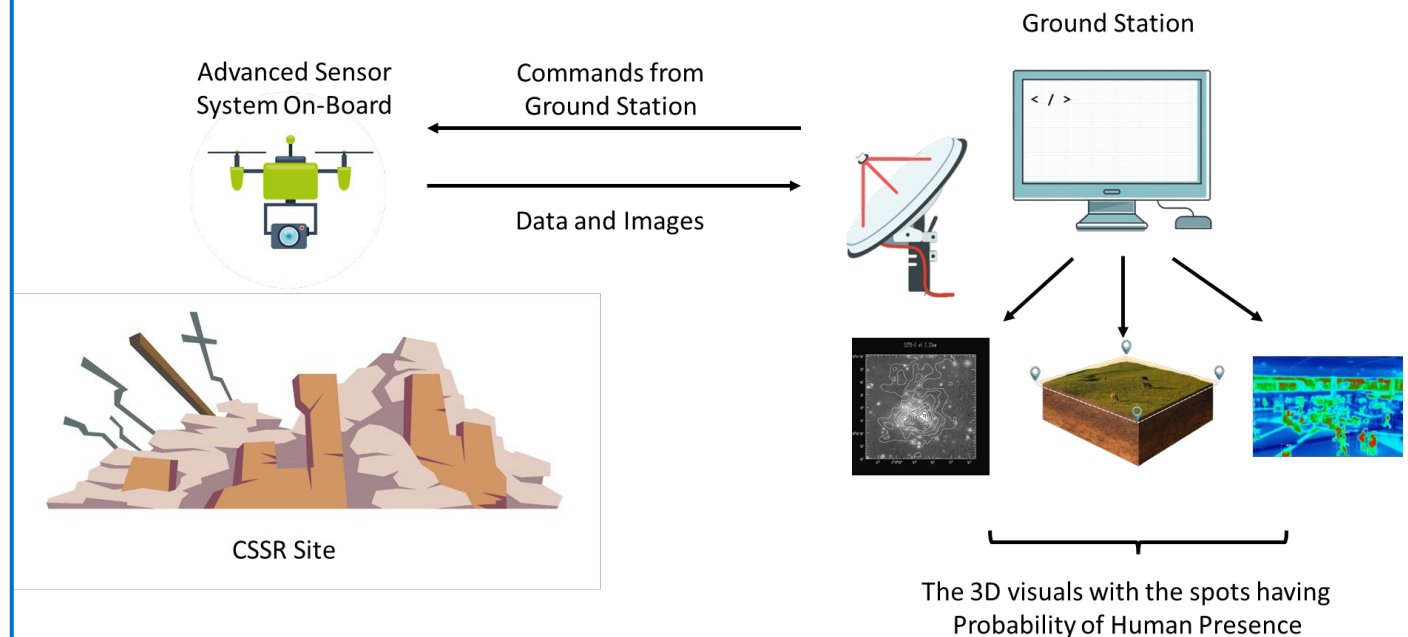
Pixhawk Flight Controller, MicroController: STM32, Infrared Thermal Cameras, Gas Sensors, GPS module.

## Communication:

Customized Copper Antenna, RF communication Module

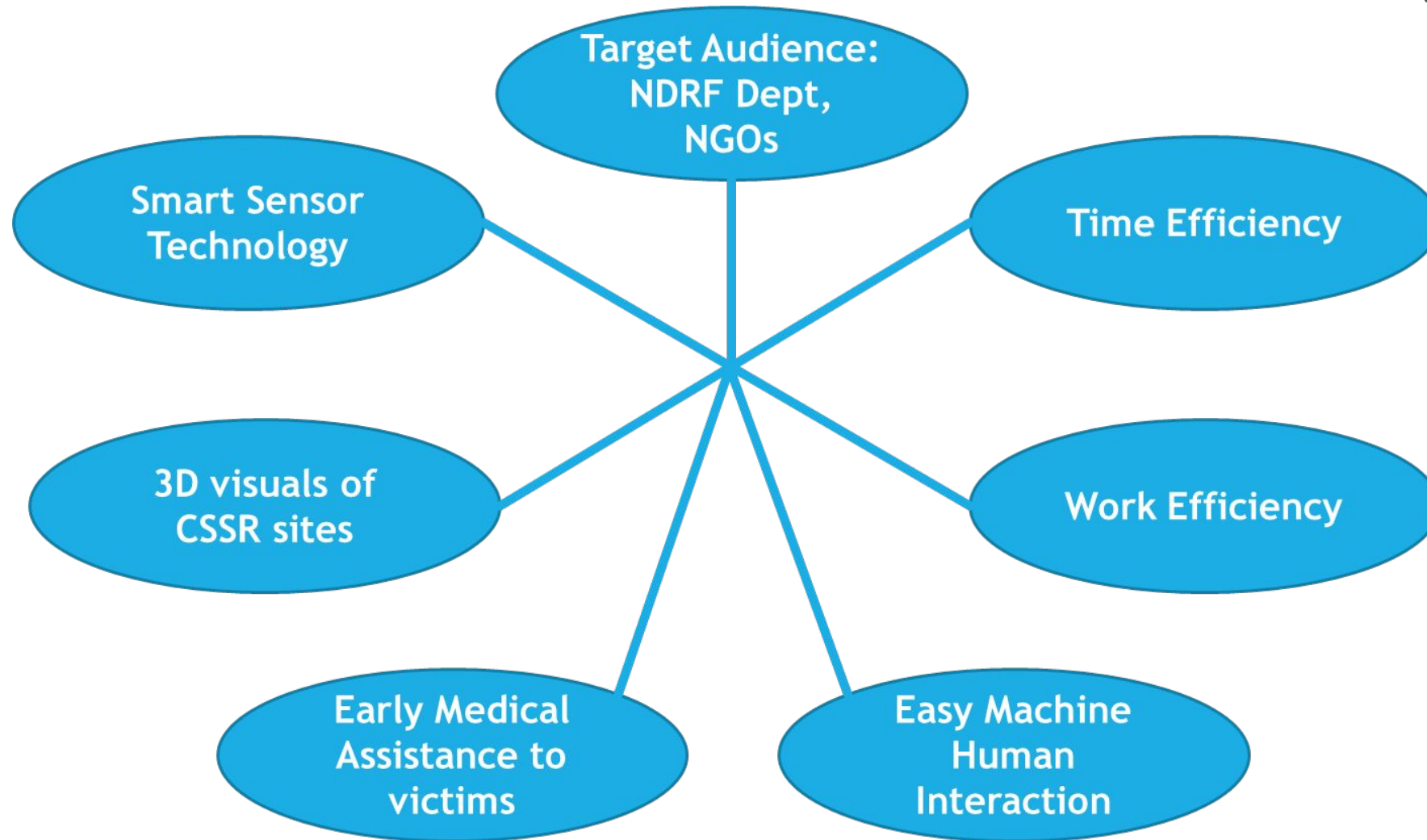
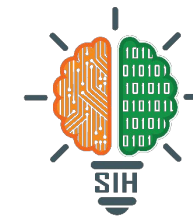
**Pixhawk Mission Planner for Drone Flight Plan**

## PROCESS FLOW ARCHITECTURE



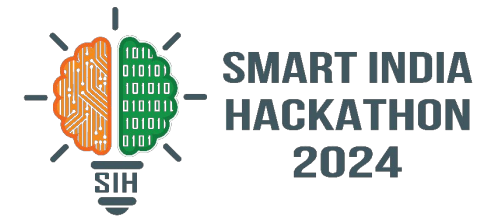
- **Technological advancements:** UAVs, sensors, and Data analytics have become increasingly sophisticated, making it possible to collect and process data efficiently.
- **Enhanced safety:** UAVs can operate in hazardous environments, **minimizing risks to human rescuers.**
- **Successful Implementation:** Drones are already implemented in various fields like agriculture, etc making it a reliable option.
- **Operational Challenges:** Operation of drones requires Trained remote pilot
- **Technical Challenges:** Data Transmission and Communication Limitations
- **Environmental Challenges:** Weather Conditions, Windstorms might affect the operational efficiency of the UAVs

# IMPACT AND BENEFITS



- Research Paper By: Bethanney Janney  
[Click Here](#)
- Discussion with the mentors :
  - 1) Dr. S. Ghosh
  - 2) Mr. A. G. Patil.

# IMPORTANT INSTRUCTIONS



Please ensure below pointers are met while submitting the Idea PPT:

1. Kindly keep the maximum slides limit up to six **(6)**. ( Including the title slide)
2. Try to avoid paragraphs and post your idea in points /diagrams / Infographics /pictures
3. Keep your explanation precise and easy to understand
4. Idea should be unique and novel.
5. You can only use provided template for making the PPT without changing the idea details pointers (mentioned in previous slides).
6. You need to save the file in PDF and upload the same on portal. No PPT, Word Doc or any other format will be supported.

**Note - You can delete this slide (Important Pointers) when you upload the details of your idea on SIH portal.**