SMART INDIA HACKATHON 2025

- **Problem Statement ID – SIH25139**
- **Problem Statement Title- Student Innovation (Disaster Management)**
- **Theme- Disaster Management / AI + IoT**
- **PS Category- Software + Hardware**
- **Team ID :**
- **Team Name : ResQNet**

ResQNet

Our Proposed Solution: ResQNet

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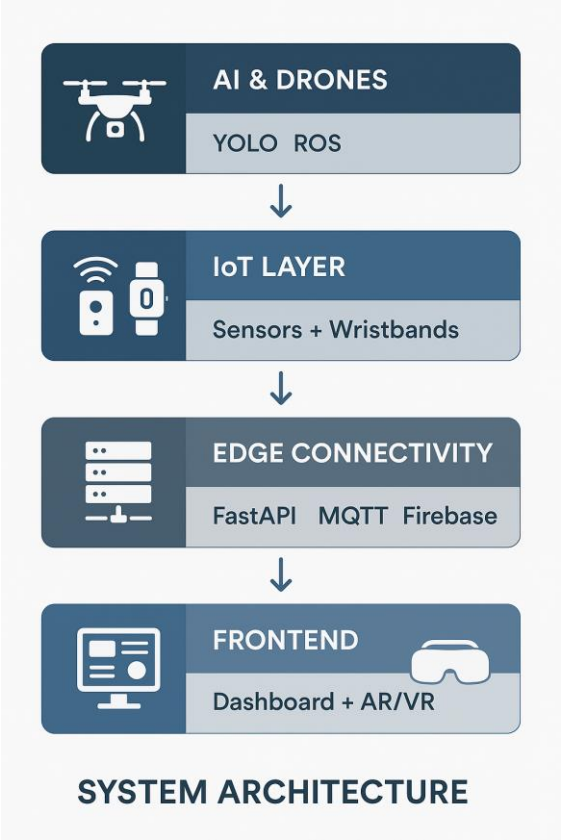
❖ ResQNet is an integrated, intelligent platform designed to accelerate disaster response and coordination.

- **Autonomous Drones + AI (YOLO v8) :**
  – Rapid victim detection (95 % accuracy) and automatic supply drops to unreachable zones.
- **Advanced IoT Sensor Network :**
  – Flood-level, fire-gas, and seismic sensors deliver 30-second early warnings.
- **NGO Coordination Dashboard :**
  – Live geo-tagged requests, AI-based inventory matching, 70 % faster resource allocation.
- **Innovation & Uniqueness :**
  – First end-to-end stack combining drones, IoT wearables, edge mesh networking, and AR/VR command views.

System Flowchart

ResQNet

TECHNICAL APPROACH



- **AI & Drones:** Python, ROS, YOLO, Drone APIs
- **IoT Devices:** Arduino/Raspberry Pi with specialized flood, fire, and quake sensors.
- **Wearables:** Smart IoT wristbands featuring GPS, SOS, and vital signs monitoring.
- **Edge Connectivity:** Drone hubs functioning as mesh network nodes for robust communication.
- **Backend**: FastAPI/Flask for APIs, MQTT for messaging, Firebase/AWS for scalable cloud services.
- **Frontend**: React.js for interactive dashboards and Unity/Three.js for immersive AR/VR command interfaces.

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FEASIBILITY AND VIABILITY

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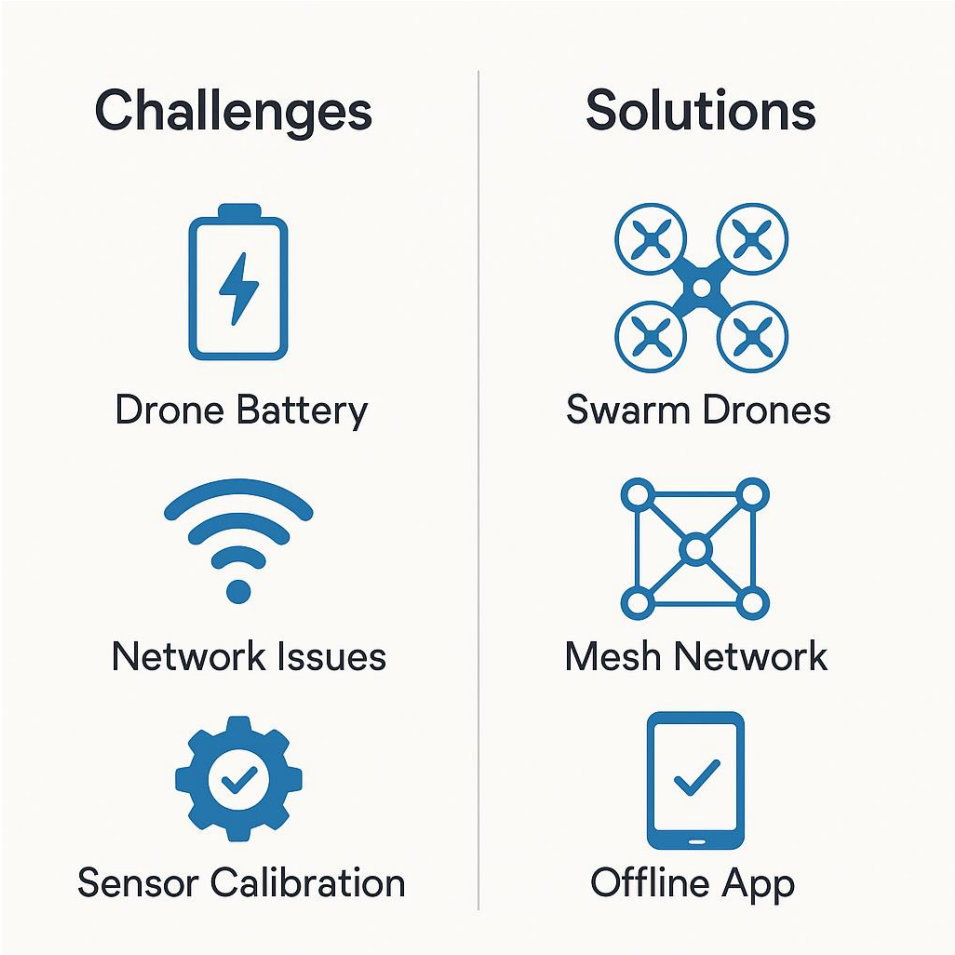
- **MVP feasible** with AI victim detection, IoT sensors, and dashboard demo
- **Low-cost wearable prototypes** (SOS, vitals, GPS beacon) can be built with Arduino/Raspberry pi
- **Challenges:** Drone battery, network failures, large-scale deployment
- **Mitigation:** Swarm drones, mesh connectivity, offline-first app design
- **Scalable** to floods, earthquakes, and fire disasters



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IMPACT AND BENEFITS

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Faster Rescue
(Lives Saved)

Unified Coordination
(NGOs + Govt)

Efficient Resource Use
(Boats, Food, Shelters)

Scalable
(National Disaster Relief)

- **Lives Saved:** Faster rescue with real-time intelligence
- **Unified Platform:** NGOs + Govt coordination in one place
- **Efficient Resource Use:** Smarter allocation of boats, food, shelters, medicines
- **Social Impact :** Builds safer, disaster-resilient communities
- **Scalable:** Extendable to floods, earthquakes, and fire emergencies

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RESEARCH AND REFERENCES

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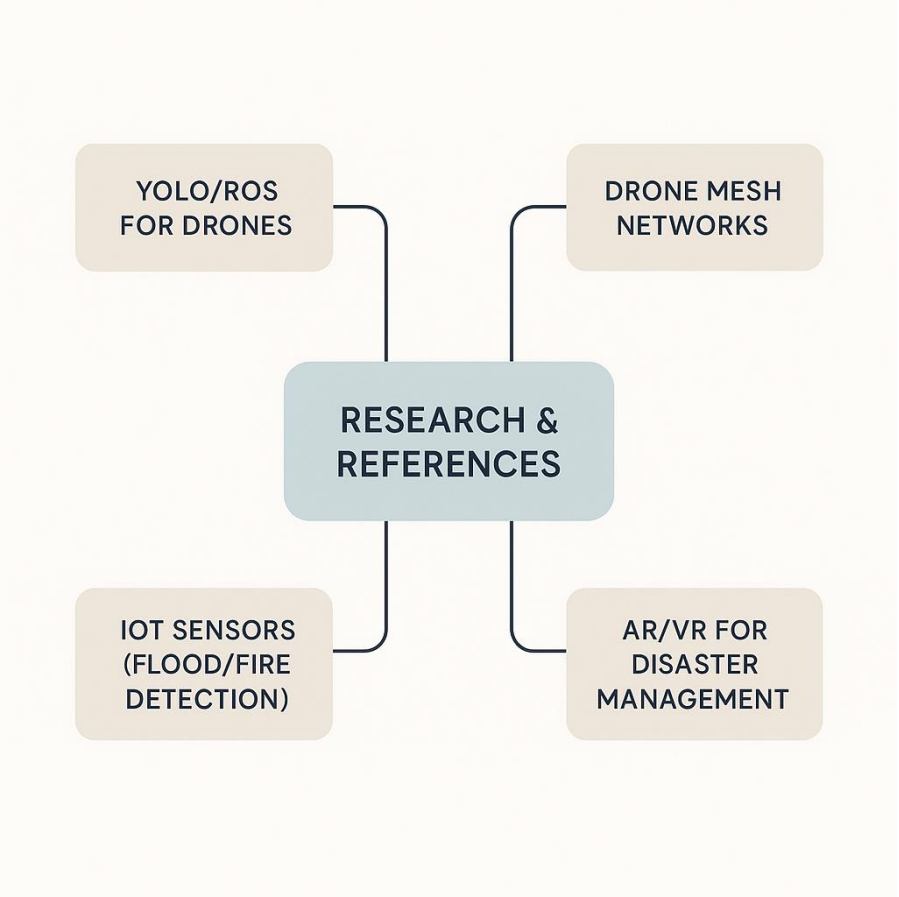

- **YOLO & ROS:** Object detection and autonomous navigation frameworks for drones.
- **IEEE Research:** Drone-assisted disaster response and search & rescue systems.
- **IoT Sensors:** Flood monitoring using ultrasonic & water level sensors, fire detection using gas/smoke sensors.
- **Edge Networking**: Studies on drone-based mesh networks for communication in disaster-hit areas.
- **Wearable Tech**: WHO + healthcare IoT papers on vital monitoring & SOS systems.
- **AR/VR in Disaster Management:** Research on immersive command interfaces for real-time disaster visualization.