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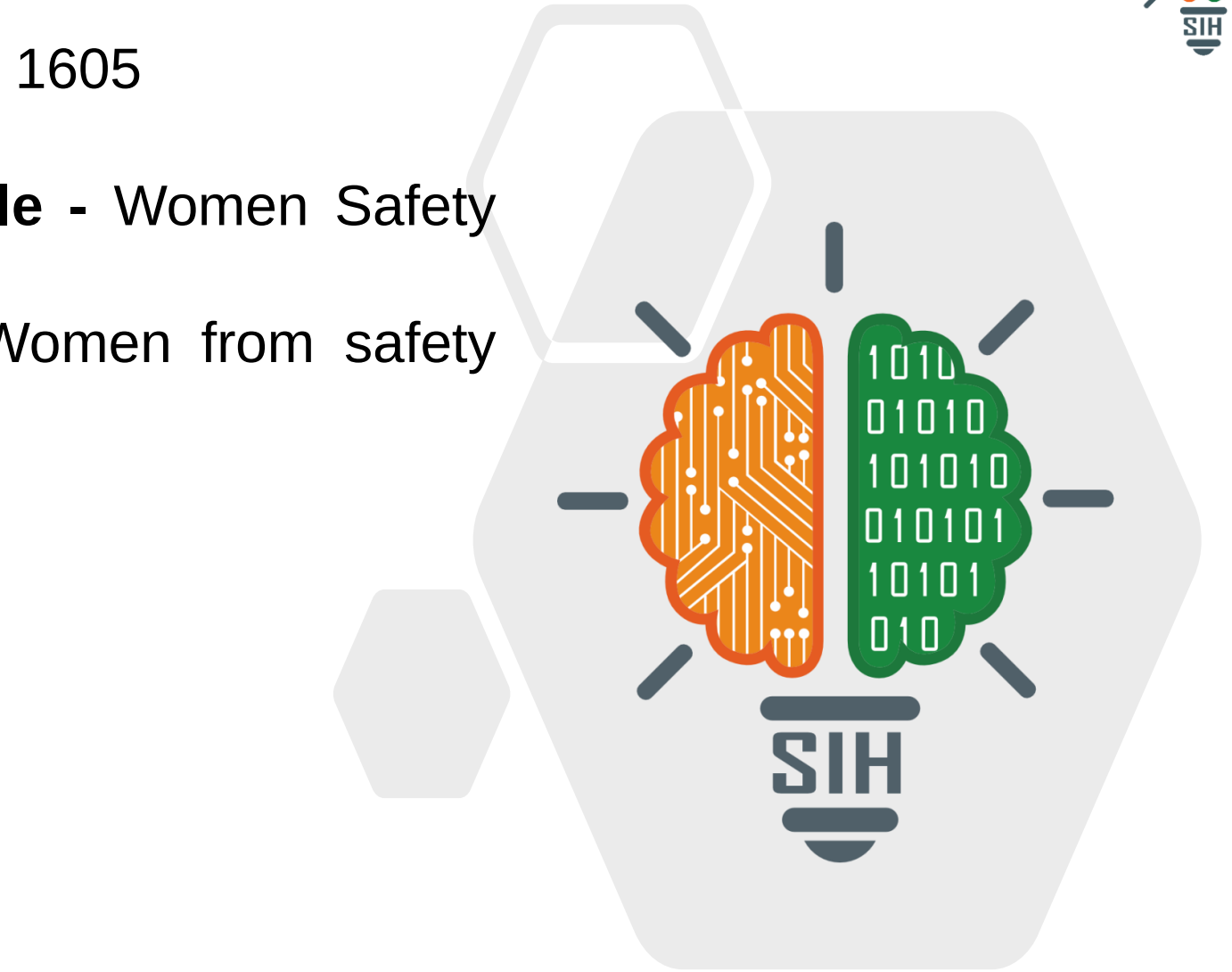
- **Problem Statement ID -** 1605
- **Problem Statement Title -** Women Safety Analytics – Protecting Women from safety threats
- **Theme -** Miscellaneous
- **PS Category -** Software
- **Team ID -** 7251
- **Team Name -** TECHNOVATORS



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Women Safety Analytics

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IDEA / SOLUTION:

Implementation of a real-time **Women Safety Analytics System** designed to detect harassment and unsafe situations in public spaces through CCTV video surveillance. The solution leverages advanced machine learning algorithms and deep learning models for behavior detection and SOS alert triggering.

- **CCTV-based surveillance monitoring system** that analyzes live footage for harassment detection.
- **AI-powered harassment detection models** to classify harmful actions.
- The **SOS app** triggers alerts with a **voice code**, notifying authorities and contacts via **WhatsApp, SMS, email, and calls** for **quick help**.
- The **Smart Ring** triggers **immediate alerts** when pressed, offering protection by being difficult for intruders to remove.
- Detected crimes are **uploaded to the cloud**, marking **hotspots** on an **interactive map** for **real-time awareness**.

Problem Resolution:

- **Round-the-Clock Smart Monitoring:** Eliminates the need for manual oversight with **intelligent, automated tracking** of potential threats in real time.
- **Enhanced Public Safety: Instantly detects** risks and sends **rapid-response alerts**, creating a **safer, more protected environment** for women.

Unique Value Propositions (UVP):

- **Real-time Surveillance Analytics:** Real-time AI detects harassment instantly with high accuracy.
- **Multi-channel Alert System**: Sends emergency alerts through WhatsApp, SMS, email, phone, and the **smart ring** ensuring immediate response even if the woman is unable to access her phone.
- **Low-Network SOS Alerts:** The system uses SMS and email efficiently to ensure SOS alerts are sent even in low-signal areas.

Demo video link : Click Here

GitHub link : Click Here

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TECHNICAL APPROACH

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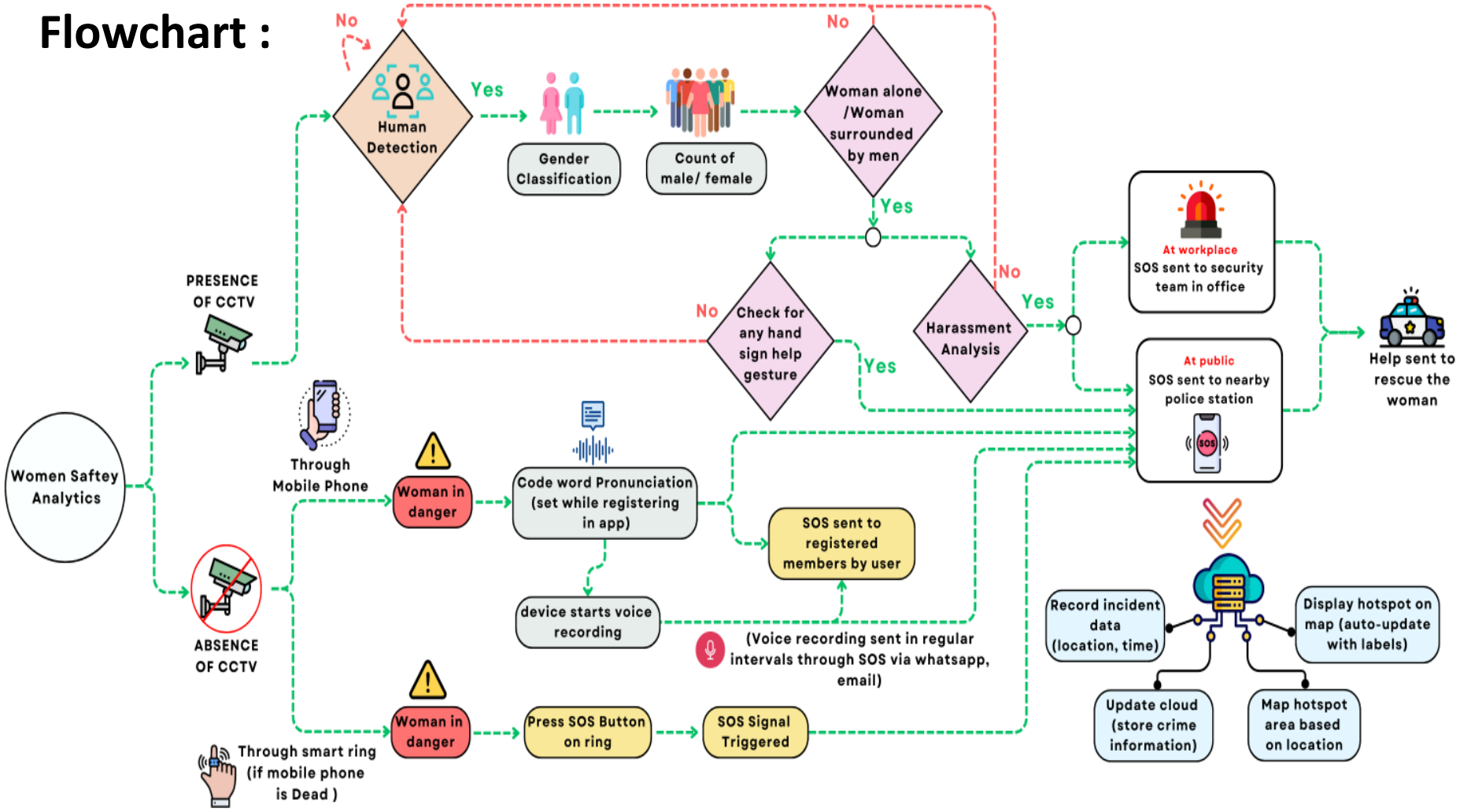
Flowchart :



Technological Stack

Hardware

CCTV Camera

Micro controllers

ARDUINO

Software

OpenCV

React Native

Flask

Keras

Google Cloud

TensorFlow

mongoDB

python

Google Maps

ultralytics YOLOv8

FastAPI

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FEASIBILITY AND VIABILITY

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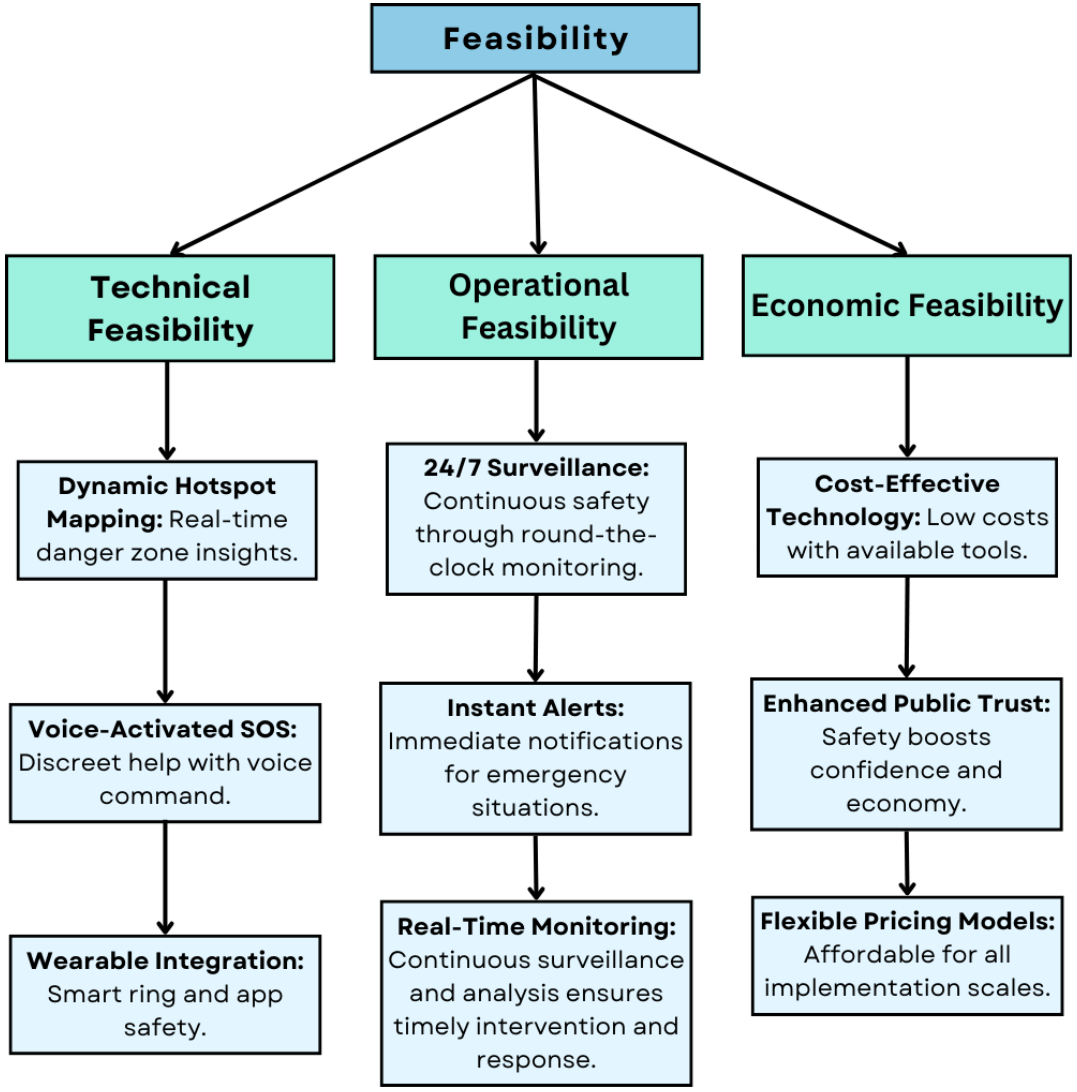

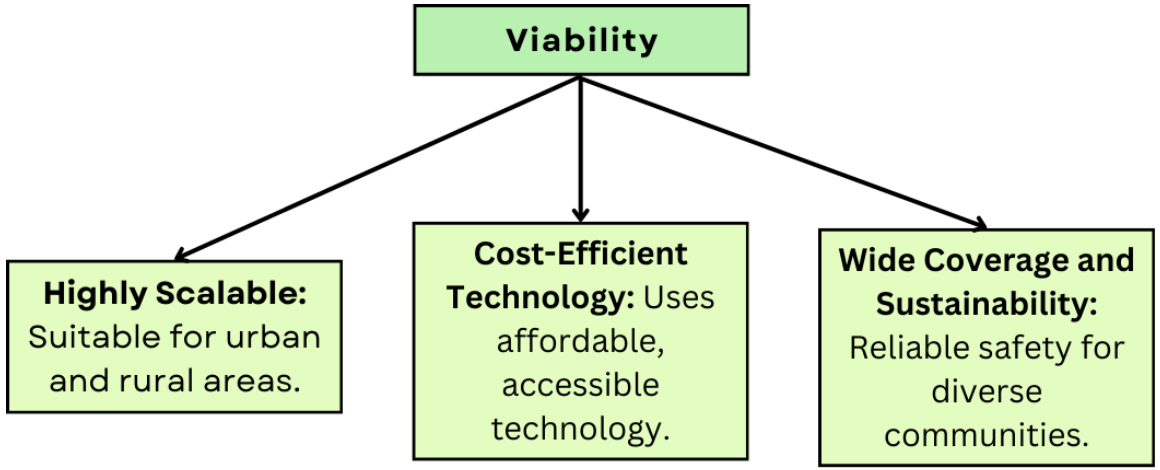

Potential Challenges and Risks:

- **User Error in SOS Triggers:** **Accidental** smart ring or app activation might cause **undue panic** or misallocation of resources.
- **Low-Quality Footage:** **Subpar lighting** or resolution could obstruct **precise human detection** and emotion analysis.
- **False Positives:** **Erroneous behavior detection** may flood authorities with **unnecessary alerts** and false alarms.

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IMPACT AND BENEFITS

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Impact	Existing Solution	Proposed Solution
➢ Promotes **public awareness** and safety, encouraging more proactive measures to **prevent harassment and assault**, leading to **boosted awareness** in communities. ➢ Provides women with a **reliable** and accessible tool for **immediate help** in dangerous situations, enhancing **personal safety**. ➢ Promotes a **safer environment**, encouraging more women to feel **secure** in public spaces, leading to **increased public confidence**.	Manual CCTV monitoring can cause delays and errors in detecting threats, leading to **missed incidents and longer response times.**	The new solution employs **cutting-edge algorithms** to detect threats such as harassment or gender-based violence, enabling **fast response**.
	Most surveillance solutions use basic motion detection or facial recognition but lack the sophistication to identify **specific threats like harassment or gender-based violence**.	The proposed solution **minimizes delays and errors** in response by integrating **automatic SOS alerts**, ensuring **quicker intervention**.
	Most current systems **lack voice command functionality**, leaving women vulnerable when they are unable to physically interact with their device.	Our solution offers **hands-free voice commands** to trigger automatic SOS alerts on mobile phones, combined with a **discreet smart ring** worn by women. The ring allows users to send an SOS by **pressing a button**, even if they can't access their phone.

RESEARCH AND REFERENCES

JOURNALS

- Malkari, Mukesh Kumar, S. Maruthuperumal, Ajay Kumar Reddy Duggu, Kruthik Chander Maidamshetty, and Srinivasa Reddy Medagam. "Integrated Women Safety Application." International Journal of Research in Engineering, Science and Management 7, no. 4 (2024): 64-67.
- Kohli, Priyanka, Kawaljeet Singh, and Brahmaleen K. Sidhu. "Design of Real Time Intelligent System for Women Safety." Recent Patents on Engineering 18, no. 3 (2024): 77-83.
- Rathore, Sagar Singh, Naveen Kumar Dewangan, Ravindra Manohar Potdar, Pradeep Barde, and Pranjali Jumle. "IoT-Based Smart Safety Analyzer for Women." In Impact of AI on Advancing Women's Safety, pp. 185-199. IGI Global, 2024.

TOOLS

SOS Alert | Emergency & Safety :
https://play.google.com/store/apps/details?id=com.rghvsapp.android.sosalert&pcampaignid=web_share
Kaaval Uthavi :
https://play.google.com/store/apps/details?id=com.amtexsystems.kaavaluthavi&pcampaignid=web_share