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Problem ID:1605

Problem Statement Title: women safety analytics.

Department:BHEL

Category: Software

Team: SafeTech

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What makes this essential?

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✦According to the Times of India, the number of reported crimes against women increased by more than **30%** from **3.37 lakh in 2014** to **4.45 lakh in 2022**.

✦**Every hour**, India reports **more than 51 cases** of crimes against women.

In India, **only one out of four** reported rape cases results in a conviction, primarily due to a **lack of evidence**.

✦This problem has two solutions: either **prevent the crime** or ensure that the **criminal is punished** if the crime occurs.

✦To address both aspects, we propose an **emergency alert system** that:

- Triggers your smartphone to **capture an image**, save it to your drive, and send an **automated message** to the authorities.
- The message contains the **current GPS location**, **day and night observation data**, and the **number of males and females** captured in the image.

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Proposed solution

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- ✦The entire system is **app-driven, automated**, and triggered with a **single click**.
- ✦Pressing the **SOS button** activates the app, which fetches the **location** and generates an **automated message** containing the number of people and the location.
- ✦The app captures **multiple rounds of pictures** each time the button is clicked.
- ✦It determines whether it is **day or night**. If it's nighttime, the system sends **multiple alerts** to the authority's server for faster service.
- ✦The model detects the **total number of people** and identifies the **number of males and females** in the image.
- ✦Every click is treated as an **emergency situation**, regardless of the victim's gender. **Uploaded photos** assist authorities in quickly finding the victim and resolving the case as soon as possible.

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TECHNOLOGIES USED

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Development Frameworks:

- **Flutter**: A UI toolkit from Google used for building natively compiled applications for mobile, web, and desktop from a single codebase. It provides a rich set of pre-designed widgets and tools to create a smooth and responsive user interface.
- **Node.js**: A JavaScript runtime built on Chrome's V8 engine, used for building scalable server-side applications. It handles backend processes, including API creation, data management, and server interactions.

Image Storage:

- **Google Drive**: A cloud storage service used to store and manage images captured by the app. **Google Drive API** is integrated to handle file uploads, storage, and retrieval, ensuring that images are securely stored and accessible when needed.

Image Processing and LLM:

- **OpenCV**: An open-source computer vision and machine learning library used for real-time image processing. It helps with tasks such as image recognition, object detection, and feature extraction.
- **Datasets from Kaggle**: Kaggle is a platform for data science competitions and datasets. Datasets from Kaggle are utilized to train and validate machine learning models for tasks related to image processing and analysis.
- **Various Sources**: Additional datasets and tools are used to complement Kaggle datasets and enhance the capabilities of the LLM (Large Language Model) in the app.

SOS Messaging:

- **SendGrid**: A cloud-based service for sending transactional and marketing emails. It is used to send automated SOS messages, ensuring reliable and timely delivery of alerts to authorities.
- **Other Technologies**: Additional technologies and packages are integrated to support the overall functionality of the SOS messaging system, providing features such as automated alerts and integration with other services.

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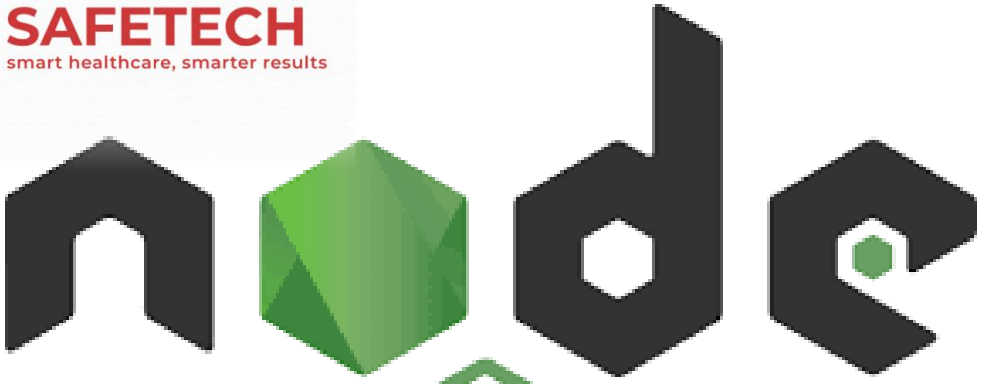
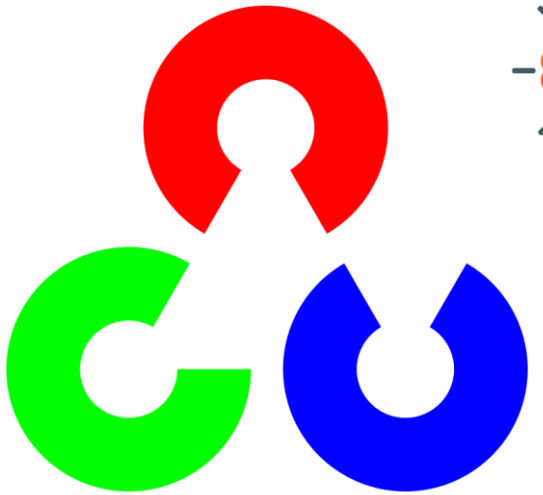


kaggle



OpenCV

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Flutter

DEEP LEARNING

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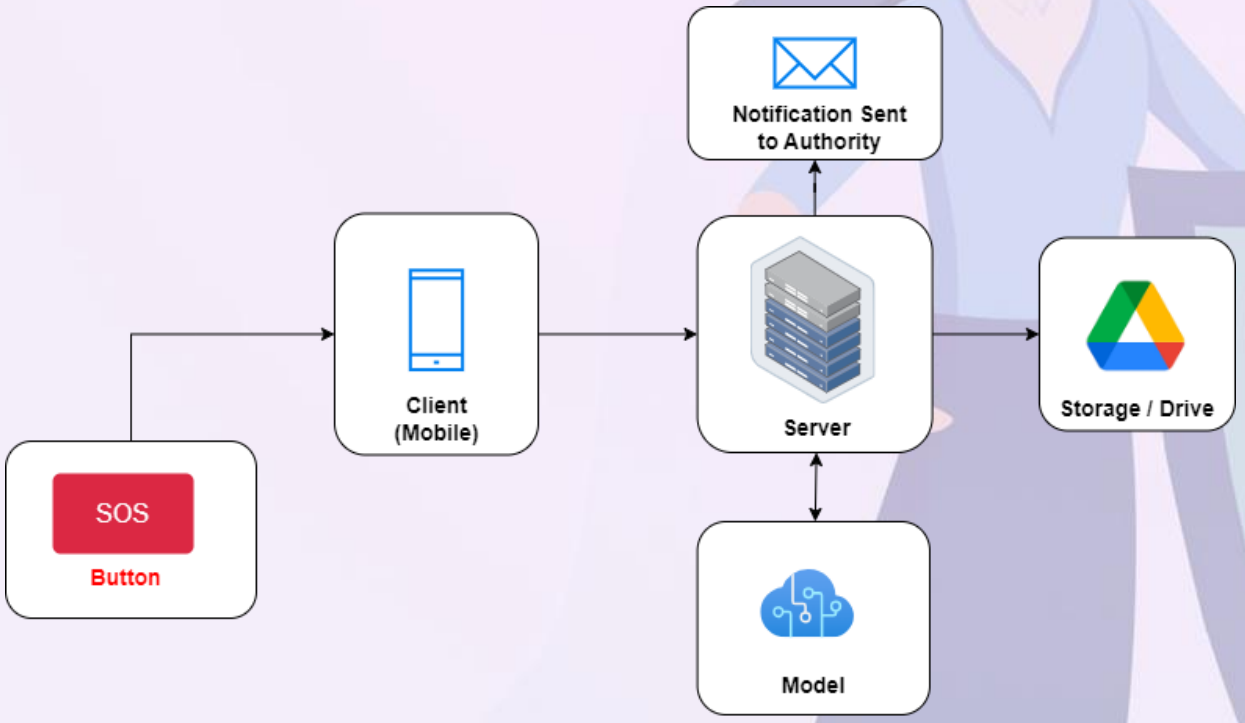
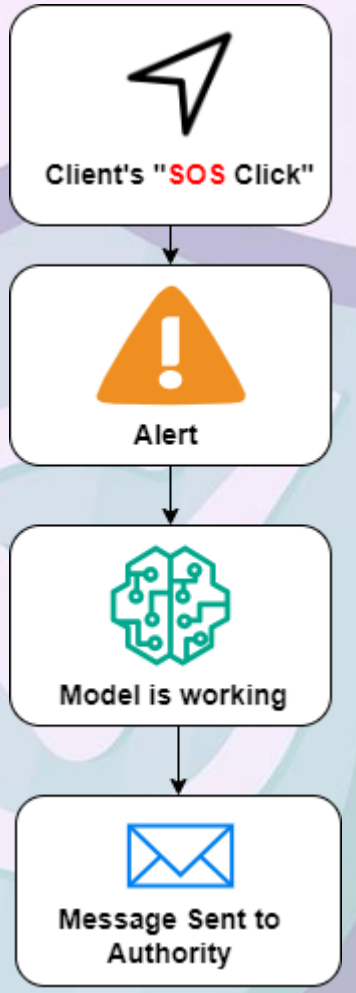
ARCHITECTURE FLOW CHART





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IMPACT AND BENEFITS

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Immediate Response: The single-click activation of the SOS button ensures a rapid response in emergency situations, minimizing delays in alerting authorities.

Enhanced Location Accuracy: Automated location fetching and detailed messaging provide precise information about the incident's location, facilitating faster intervention by emergency services.

Comprehensive Evidence Collection: Capturing multiple rounds of pictures provides a thorough record of the scene, including the number of people and their gender distribution, which is crucial for investigations.

Adaptive Alert System: By distinguishing between day and night, the system adjusts its alert frequency, ensuring that notifications are sent promptly and effectively based on the time of day.

Broad Coverage and Efficiency: Treating every click as an emergency, regardless of the victim's gender, ensures that all potential incidents are taken seriously. The uploaded photos help authorities quickly identify and assist victims, improving the likelihood of resolving cases efficiently.