Proposal Document - The Glitch Hunters

Problem statement title :- Women Safety Analytics – Protecting Women from safety threats
Problem statement - SIH1605

Abstract: Women's safety in urban areas is a growing concern due to increasing incidents of harassment and violence. The Women Safety Analytics system aims to address this issue through real-time threat detection. By leveraging advanced technologies, the system continuously monitors public spaces, detects potential threats, and generates alerts to prevent incidents. This proactive approach enhances public safety, reduces false alerts through human verification, and provides valuable data for strategic planning, supporting law enforcement in protecting women more effectively.

Solution: The Women Safety Analytics system is a comprehensive surveillance and analytics solution that monitors public spaces in real-time. It uses state-of-the-art technologies to detect individuals, classify them by gender, and analyze behavioral patterns. The system identifies potential threats, such as a lone woman at night or a woman surrounded by men, and recognizes distress signals through gesture analysis. To ensure accuracy, alerts are subject to human verification, reducing false positives and refining the system’s models over time. Verified alerts are then sent to law enforcement for prompt intervention. The system also maps high-risk areas based on historical data, allowing for proactive safety measures.

Technologies:

1. **Computer Vision and Deep Learning:** The system uses advanced computer vision techniques and deep learning models, such as Convolutional Neural Networks (CNNs), to detect and classify individuals in real time. These models process live video feeds from surveillance cameras, tracking and analyzing movements and behaviors to identify potential threats.

2. **Person Detection and Gender Classification:** Machine learning algorithms detect people in the camera's view and classify their gender. The models are trained on diverse datasets to ensure accuracy across different environments and conditions. This component provides insights into gender distribution, highlighting potential risks.
3. **Gesture Recognition and Motion Analysis:** Gesture recognition technology detects specific movements indicating distress, such as an SOS gesture. Motion analysis algorithms monitor unusual or erratic behavior, triggering alerts when combined with contextual factors like time of day or location.
4. **Real-Time Data Processing:** The system processes large volumes of data in real-time using edge computing techniques, reducing latency and ensuring timely alerts. Initial processing occurs close to the source, with further analysis and storage handled centrally. Alerts are then verified by human operators to reduce false positives, ensuring only genuine threats trigger law enforcement intervention.
5. **Big Data Analytics and Predictive Modeling:** The system employs big data analytics to identify patterns and trends from historical data, informing safety strategies. Predictive modeling forecasts potential hotspots, enabling preemptive action. Continuous learning from new data, combined with insights from human-verified alerts, refines the system's threat detection capabilities.
6. **Cloud Computing and Scalability:** Cloud computing infrastructure manages the vast data generated by continuous surveillance, ensuring scalability and efficiency. Cloud-based processing allows for seamless updates and integration of new features, keeping the system at the cutting edge of technology.

Impact: The Women Safety Analytics system will significantly improve public safety by detecting and preventing threats against women in real-time. Immediate alerts, verified by human operators, minimize false positives and enable law enforcement to intervene before situations escalate, potentially saving lives. Continuous monitoring and analysis create safer environments, allowing women to move confidently in public

spaces. The data collected, enhanced by human verification, provides valuable insights for policymakers and city planners, contributing to the development of safer urban areas. By leveraging advanced technology and human oversight, the system empowers women, reduces crime, and fosters a culture of safety and respect in our cities.