Women Drone Security System

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Abstract: *Women security is a major issue of concern in today's world. Women are subjected to unethical physical harassment. The atrocities against women can be brought to an end with the help of our project 'Women Drone Security System'. It is a security system, especially designed for women in distress. Building a mobile application using languages like Java, android, Python and Flutter and a drone using AI and machine learning. The application on detection of woman's voice will send a distress signal to the drone and will immediately inform the police & her relatives. The drone on reaching her will inject the laser on the man and blow siren to rush the near ones.*
Applications: In this project we used a drone and android application in which both, the drone and the smartphone are synchronized using Internet, hence both can be trigged independently. Further, drone can scan the faces for further investigation and can give an alert call to the pre-set contacts and to the police with the instant location.

Keywords: Research Paper, Machine Learning, Mobile Application, Drone

I. INTRODUCTION

It's a Software as well Hardware Project (mobile Application and Drone System). When woman Scream, Mobile detects (its look like when we say ok goggle and Mobile detects his/her frequency and responds same as What we said.) her voice, and App sends a distress signal to the nearest drone which is the under range of 1 kilometer Will fly towards her using the GPS tracking and location system, and that time period App sends an alert message to the police and parents and SOS to all the nearest ones.

Further, drone will sound an alarm, so that everyone knows and came forward to help her and Drone scan their faces and inject laser to all men's or spray chloroform or laughing gas. Or there is special feature of Drone, it Scan Faces with mask also and save the records to investigate further.

Women Security is very important in countries like India. It is very sad to say that women are not safe in our country. According to the National Crimes Records Bureau (NCRB), India recorded 88 rape cases every day in 2019. NCRB report highlights that rape vulnerability of a girl or woman has increased up to 44% in the last 10 years. And this problem has solved as soon as possible. There is an urgent need to understand and solve this problem of women safety so that they can also grow equally like men.

II. HOW THIS PROBLEM WILL BE SOLVED?

In our country even though it has power and an economic development, but still there are many crimes against women. We analyzed that there is no security device for our total safety. To solve this major problem issue of concern i.e., Women safety we can Create Autonomous Drone Network to Support Existing Police System to Protect Women and ensure their Security.

III. THE SOLUTIONS

Shout loudly, Run Away, Try self-defense.
But now we need to go one step ahead. Now we can create drone network system access via a mobile system to support and protect women and ensure their security and help the Police for Further investigations.

IV. LITERATURE REVIEW & BACKGROUND RESEARCH

Students of a Moradabad engineering college are claiming to have invented a drone security system for women's safety which is equipped with GPS. Named 'sandal drone', the system uses circuits in a 'sandal' (footwear) in order to send an alert to a drone when a woman wearing it triggers an alarm. In this he explained how it will be connected with the drone

and nearby police station. "It will send the location of the girl to her family and police with a message. It will also send a signal to a specially designed drone, once a distress signal is sent a drone will fly towards the user using the GPS, it will sound an alarm so people who are nearby can come forward to help. The drone will also record video that will help police in their investigation later on." The project, which they have named 'flying cop and women defense system', works on electric shock and GPS technology to send a distress signal and trigger a drone movement.

https://thelogicalindian.com/news sandal- drone-system/

https://www.indiatvnews.com/news/india- sandal-drone-security-system-for-women- 524750

V. METHODOLOGY & TECHNOLOGY

5.1 Software

1. Requirement Analysis
2. Design application and prototype
3. Build application and interaction
4. Identify defects and relative bugs
5. Come up with feedback and improve application if needed.
6. Launch

Languages: - Java, Flutter, Android and Python

5.2 Hardware

The required equipment's of this project are

A. Power Supply: Most Important concern Drones are short battery lives. Here are some ways to power the drone. Batteries, Solar power, Hydro fuel cell, Combustion engine, Tethered, Laser Transmitter.

B. GPS: GPS is a system. It's made up of three parts: satellites, ground stations, and receivers.

Satellites act like the stars in constellations—we know where they are supposed to be at any given time.

The ground stations use radar to make sure they are actually where we think they are.

A receiver, like you might find in your phone or in your parent's car, is constantly listening for a signal from these satellites. The receiver figures out how far away they are from some of them.

GPS is a system of 30+ navigation satellites circling Earth. We know where they are because they constantly send out signals. A GPS receiver in your phone listens for these signals. Once the receiver calculates its distance from four or more GPS satellites, it can figure out where you are.

C. GSM: The Global System for Mobile Communications is a standard developed by the European Telecommunications Standards Institute to describe the protocols for second- generation digital cellular networks used by mobile devices such as mobile phones and tablets. It was first deployed in Finland in December 1991.GSM module is used to establish communication between a computer and a GSMG\PRS system. Global System for Mobile Communication (GSM) SIM card is inserted within the mobile device to send and receive the messages victimisation GPRS. The GSM SIM card number is registered with the system. With increasing usage of GSM, network services square measure expanded on the far side speech to include several alternative custom applications, machine automation and machine to machine communication. It operates at either the 900MHz1800MHz frequency band.

D. ARDUINO UNO/MEGA: The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. The Mega 2560 board is compatible with most shields designed for the Uno and the former boards Duemilanove or Diecimila

E. BRUSHLESS MOTORS: A brushless DC electric motor (BLDC motor or BL motor), also known as electronically commutated motor (ECM or EC motor) and synchronous DC motors, are synchronous motors powered by direct current (DC) electricity via an inverter or switching power supply which produces electricity in the form of alternating current (AC) to drive each phase of the motor via a closed loop controller. The controller provides pulses of current to the motor windings that control the speed and torque of the motor. This control system replaces the commutator (brushes) used in many conventional electric motors.

The construction of a brushless motor system is typically similar to a permanent magnet synchronous motor (PMSM), but can also be a switched reluctance motor, or an induction (asynchronous) motor. They may also use neodymium magnets and be outrunners (the stator is surrounded by the rotor), in runners (the rotor is surrounded by the stator), or axial (the rotor and stator are flat and parallel).[1]

The advantages of a brushless motor over brushed motors are high power-to-weight ratio, high speed, electronic control, and low maintenance.

F. ULTRASONIC SENSOR: An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e., the sound that humans can hear)

G. ESC (ELECTRONIC SPEED CONTROLLER): An electronic speed control (ESC) is an electronic circuit that controls and regulates the speed of an electric motor. It may also provide reversing of the motor and dynamic braking. Miniature electronic speed controls are used in electrically powered radio-controlled models. Full-size electric vehicles also have systems to control the speed of their drive motors.

H. IMU BOARD: IMU, meaning for Inertial Measurement Unit is defined as a 9-axis sensor that measures orientation, velocity, and gravitational forces by combining Accelerometer, Gyroscope, and Magnetometer into one. IMUs typically come in large packages, but with recent developments like MEMS technology, they are now more commonly seen as miniaturized sensors designed for easy integration with Arduino or other microcontrollers.

IMUs work by detecting rotational movement of the three-axis, commonly known as Pitch, Roll, and YAW. To achieve such, it relies on the functionality of Accelerometers, Gyroscopes, and Magnetometer.

I. Accelerometers

Accelerometers serve as the tool for velocity measurement on an IMU since we know its functionality is to detect the rate of change in velocity of an object

Can only measure pitch and roll, no information about yaw

J. Gyroscopes

Gyroscopes serve as the tool for rotation/rotational rate measurement on an IMU since we know its functionality is to detect rotational changes or maintaining orientation

K. Magnetometer

Magnetometer serves as the tool for gravitational force measurement on an IMU

Compared to Accelerometer that can't measure yaw since it works on a constant gravitational force, a magnetometer is a great compliment for accelerometer sensors

Combining these three sensors gives u a 9dof IMU that measures orientation, velocity, and gravitational force. A common model of such sensors is the Intenseness MPU-9250!

L. HC-12 WIRELESS MODULE (RANGE-1 KM): The HC-12 is a half-duplex wireless serial communication module with 100 channels in the 433.4-473.0 MHz range that is capable of transmitting up to 1 km. HC-12 wireless serial port communication module is a new-generation multichannel embedded wireless data transmission module. Its wireless working frequency band is 433.4- 473.0MHz, multiple channels can be set, with the stepping of 400 KHz, and

there are totally 100 channels. The maximum transmitting power of module is 100mW (20dBm), the receiving sensitivity is -117dBm at baud rate of 5,000bps in the air, and the communication distance is 1,000m in open space.

VI. FLOW CHART
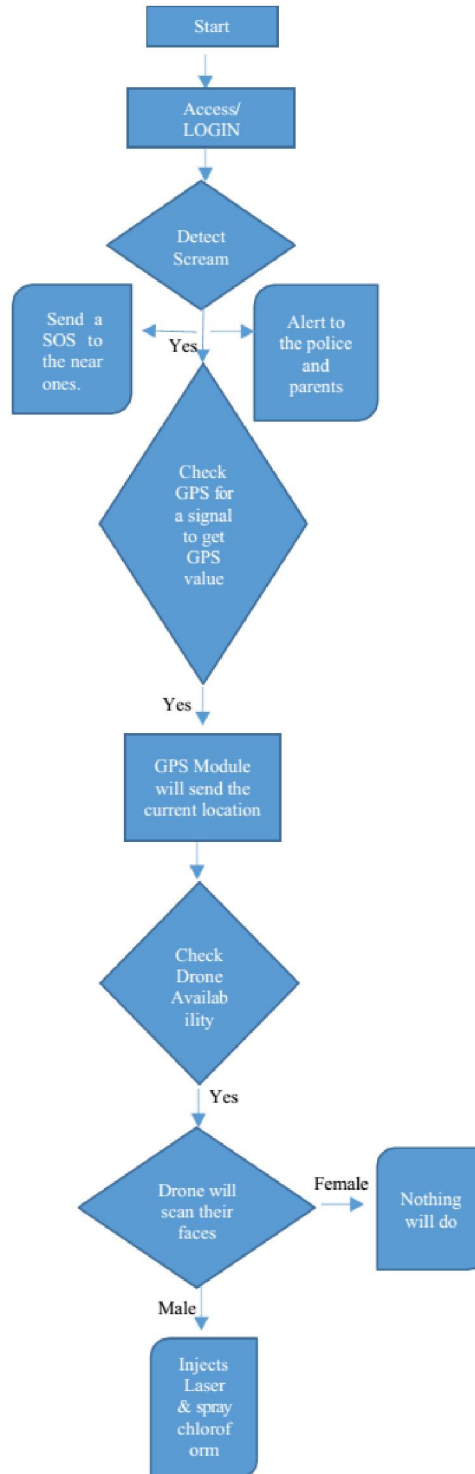
VII. CONCLUSION

Our primary goal of this project is to ensure every woman in our society to feel safe and secured. According to the survey in India 42% of working women feel 'unsafe' in their surroundings. An overwhelming 78% of them felt that the authorities are not doing enough to ensure their safety.

Women safety drone can play a major role by providing women a safe environment. This system can solve the problem to an extent. On finding that the woman is trouble, the application will immediately inform the police and sends signal to the drone that injects the laser on the man to protect the lady.

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