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SHIELDX: Her Safety Our Duty

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Abstract:

This research paper explores how we designed and built the "SHIELDX" project. Safety and health of women are big challenges in the present society, day by day frequency of such risk issues like harassment, assaults, accidents and sudden medical emergencies are increasing. A number of (wearable) mobile applications and devices have been developed, yet they typically focus on either safety or health monitoring in separation from the other, which crucially delays first response and impedes the overall effectiveness when help is needed in real-world everyday scenarios. This research paper describes SHIELDX, an integrated Internet of Things (IoT)-based Women Safety and Health Monitoring System designed as a smart wearable solution. The device allows users to monitor their health in real time, and combines health monitoring with automated emergency detection and instant alert functionality, all in a single device. SHIELDX fuses health monitoring with communication and location tracking (using GSM and GPS) to facilitate emergency detection and alerts. Health monitoring sensors include a pulse rate sensor, a body temperature sensor, and a motion sensor (MPU-6050). Users can initiate emergency alerts via a manual panic button, voice command, and even certain health anomalies, or when a user experiences a sudden fall (detected via the motion sensor). The device captures an emergency, then sends an SOS to one or more of the users emergency contacts, along with a real time location of the user and important health information, which is stored on a monitoring cloud platform. A setup like this runs cheap, uses little power, works without needing a phone - keeps going when things get tough. Tests show SHIELDX cuts down how long it takes to respond during emergencies while keeping users safer. Starting from one single base, combining health checks with personal security gives women more control. Prevention gets easier. Society moves closer to being both safer and healthier.

Keywords— IoT, AI, LED, LDR

INTRODUCTION

Nowadays, more women take part in schools, jobs, starting businesses, plus community life than before. Yet dangers around their well-being still persist across many areas. Harassment, attacks, being taken against one's will, abuse at home, unsafe work settings show up too often. Health troubles like overwhelming anxiety, passing out, unexpected sickness, injuries also make things harder when they happen. When emergencies happen, old-school help lines and cops usually arrive too late because alerts take time to send and process. Phones can assist, yet people might freeze up, unable to tap or swipe when scared. Gadgets like wrist trackers watch heart rate and steps, though they do not reach out automatically if someone is in trouble. Built for tough moments, this tool steps in where help might lag. Linking everyday tech into wearables opens doors to steady tracking plus fast alerts when needed. Meet SHIELDX - a body-worn setup running on smart networks, watching over women with live updates on both danger and wellness. From sudden risks to quiet health shifts, it responds without waiting.

This study aims to create a steady wearable gadget that brings together well-being and protection tools in one place. While cutting down how much it relies on phones, its performance gets checked during actual crisis moments. Built tough for daily wear, the unit runs tests where emergencies unfold naturally. A single goal drives each part - making help quicker when things go wrong. Real people try it out so results stay grounded in reality.

LITERATURE SURVEY

When someone triggers a panic button, many current setups rely on GPS paired with GSM to issue alerts. A few newer versions go further - embedding wearables that track body signals like pulse and heat levels. Apart from these tools, some rely too much on user input, miss emergencies without help, or track just basic body signs. Lately, studies have pushed systems that run through online networks, sending warnings by themselves to make things more dependable.

One way around those limits? The SHIELDX setup weaves together live distress spotting through body signals, user-triggered alarms, constant location updates,

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along with secure online medical records - all packed into one wearable gadget. Work from various scientists explores internet-linked gear meant to guard and track women's well-being. Past efforts show tools like cell networks, position finders, on-body detectors, also smartphone software sending crisis messages. A few setups depend only on someone pressing a button, whereas some blend heartbeat monitors, heat readings, plus movement trackers. Wearables meant for safety usually come with a button to press, loud sirens. Even if they work well, automatic detection isn't always built in - neither is close watch over vital signs. Lately, studies point toward using cloud systems that store information and study it in real time, which opens doors to constant body signal updates.

A tiny device, SHIELDX takes those ideas further - using instant alert sensing alongside user-triggered help signals. Location updates stream live while wellness data travels to secure online storage. One small gadget ties it all together.

EXISTING SYSTEM

Folks looking at how to help women stay safe or track their well-being usually land on one of two paths - either tools built just for protection or ones meant only for checking physical condition. These options tend to split attention, each handling a single piece without mixing the two.

A. Safety-Focused Systems

When things go wrong, some women turn to apps on phones that shout for help. Location gadgets tag where someone is, sending it straight to others who care. Devices you can wear often come with a button that calls out when pressed fast. Help might arrive quicker because of these tools. Yet every fix has its weak spots showing up now and then

• Glued to screens, people lean hard on constant web access. Without signal, daily routines stumble. Devices run lives more than before. Connection gaps cause real trouble now. Offline moments feel foreign, almost wrong

• When trouble hits, someone must turn it on by hand

• Failing to notice when someone passes out or shows signs of medical trouble

B. Health Monitoring Systems

Watching your heartbeat, how hot you get, even how much you move - gadgets do that now. Useful if you want to stay ahead of problems. Yet when trouble hits, they cannot call for help.

C. Limitations of Existing Systems

When safety tools do not talk to health monitors, gaps appear in protection. Emergencies out in the world rarely come alone - danger and medical trouble show up together. Most current setups ignore that reality, leaving people exposed longer than needed. Alerts drag behind when systems work separately.

PROBLEM DEFINITION

Many current tools need a phone nearby or only do simple tasks. Some require users to press buttons when help is needed, which slows things down. These gadgets often miss signals, connect poorly, or send alerts too late. What this work tackles is building a connected wearable that watches vital signs nonstop. It spots emergencies by itself. Alerts go out fast, tagged with live location data.

OBJECTIVE

1.To ensure women's safety through real-time emergency alerts.

SHIELDX aims to keep women safe right when it matters. Help arrives quickly thanks to immediate alert systems. Safety shows up faster because warnings go out without delay. Safety for women begins when help arrives fast. Alerts sent instantly change outcomes. When danger strikes, timing shifts everything. Instant notifications make a difference. Response speeds improve with live updates. Protection grows stronger through immediate warnings.

2.To continuously monitor vital health parameters.

Watching key health signs without stopping. A small pulse reader picks up heartbeats. Motion detectors notice quick shifts in movement. Body heat gets recorded by a thermal monitor. One after another, these tools feed live data. Sudden jolts trigger alerts through the motion chip. Heat levels update without delays. Each part works on its own yet fits together. Information flows steadily from skin contact. Notice when stress spikes, heartbeat acts strangely, or a person suddenly drops. Unusual patterns show up clearly. Signs like these can point to trouble. Body signals might hint at deeper issues. Something feels off - maybe it is.

3.To integrate cloud-based health monitoring.

Sending live readings straight to online systems like ThingSpeak or Firebase keeps info flowing without delay. Information moves the moment it's captured, feeding into digital spaces where updates happen constantly. A single

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glance at the screen shows how someone is doing today. Someone else might check in from miles away without stepping inside. A doctor could notice changes before symptoms get worse. Family watches quietly, knowing they can act fast if needed.

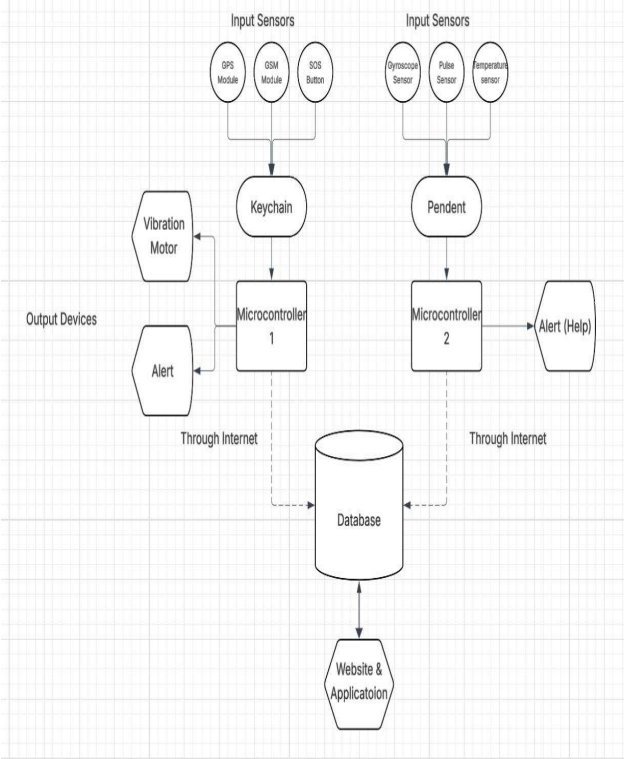
4.To minimize dependence on smartphones.

Built right into the device, communication tools like GSM and GPS keep things running even when phone apps fail. This setup stays active during emergencies because it does not rely on external software. When signals matter most, the connection holds through its own channels. A budget-friendly setup that moves easily comes together here. This way, it travels well without spending too much.

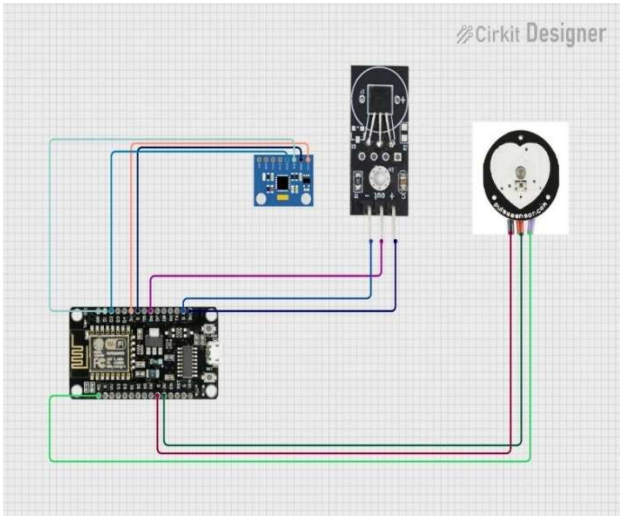
METHODOLOGY

A fresh step shapes how SHIELDX operates - each piece builds on the last without overlap. One phase flows into another, starting with gathering raw information. After that comes refinement of what was collected, smoothing rough edges before analysis begins. Thinking through options happens next, guided by set patterns but ready to shift. Warnings appear only when needed, triggered by clear shifts in context. Messages move outward through secure paths, never skipping verification steps. Finally, updates sync quietly with distant servers, making sure nothing stays behind.

FLOWCHART



CIRCUIT DIAGRAM



FUTURE SCOPE

Few updates down the line could push SHIELDX much further. Tossing in smarter algorithms might let it spot odd behaviour before trouble shows up. Background noise won't matter so much if speech controls get sharper through artificial intelligence. Big rollouts feel possible once these pieces click together.

When linked to national emergency networks like India's 112, help could arrive much faster. Running on smarter battery systems means devices stay active longer between charges. Down the road, stronger data protection might come through encrypted signals, fingerprint access, plus cloud tools that track neighbourhood safety trends.

CONCLUSION

Right from the start, this study introduces SHIELDX - a smart system built on IoT technology meant to help women stay safe and monitor their health. Instead of just focusing on one issue, it combines body-worn sensors with location tracking, mobile network connectivity, online data storage, along with automated response mechanisms. Because it runs constantly, protection and physical well-being checks happen without delays. The whole setup reacts quickly when something goes wrong.

A fresh approach steps past old barriers - no phone needed, emergencies caught without help, care woven into protection. Tests show quicker reactions, steadier performance, better ease of use. This setup could fit well in city networks, health tracking, and efforts to keep women safe. Given more upgrades, it might quietly reshape how tech supports people, one thoughtful change at a time.

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