Blockchain-Based Multi-User Dynamic Verifiable Searchable Encryption for Secure Data Storage and Query on Malicious Cloud Server

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Abstract- *The increasing elderly population has led to a growing demand for intelligent healthcare monitoring systems. Falls are one of the major causes of injury and mortality among elderly individuals. This paper proposes an IoT-based remote monitoring system using six-axis acceleration sensors to detect falls in real time. The system integrates edge computing to process sensor data locally, reducing latency and improving response time. By combining accelerometer and gyroscope data, the system accurately distinguishes between normal activities and fall events. Alerts are instantly sent to caregivers through IoT communication modules. The proposed system ensures improved safety, reduced false alarms, and enhanced real-time monitoring for elderly individuals.*

Keywords: IoT, Fall Detection, Six-Axis Sensor, Edge Computing, Remote Monitoring, Healthcare

I. INTRODUCTION

The advancement of IoT technologies has enabled real-time health monitoring systems. Elderly individuals are highly vulnerable to falls, which can lead to severe injuries. Traditional monitoring systems lack real-time response and accuracy.

This research focuses on designing a smart fall detection system using six-axis sensors and edge computing. The system ensures continuous monitoring, real-time alerts, and improved reliability.

II. PROBLEM STATEMENT

Existing systems suffer from:

- High latency due to cloud dependency
- Low accuracy in fall detection
- Privacy concerns
- High cost and complexity

There is a need for a real-time, accurate, and low-cost monitoring system.

III. PROPOSED SYSTEM

The proposed system uses:

- Six-axis acceleration sensor
- Edge computing for fast processing
- IoT communication for alerts

It detects falls and immediately notifies caregivers.

IV. SYSTEM ARCHITECTURE

 (Insert this image in your paper)
 Image suggestion: IoT Architecture Diagram
[Sensor] → [Edge Processing] → [Cloud/Server] → [Caregiver Alert]

- “IoT fall detection architecture diagram”
- “Edge computing IoT architecture”

V. MODULES

1. Sensor Module
Collects motion data using accelerometer & gyroscope.

2. Edge Processing Module
Processes data locally to detect falls quickly.

3. Fall Detection Module
Identifies falls using threshold-based logic.

4. Communication Module
Sends alerts via IoT (WiFi/Bluetooth).

5. Alert Module
Notifies caregivers through SMS/app.

6. Database Module

Stores user and sensor data.

VI. METHODOLOGY

 (Insert this image)
 Image suggestion: Flowchart of fall detection

Steps:

1. Data collection
2. Data processing
3. Fall detection
4. Alert generation
7. Implementation

The system is developed using:

- Android (Java, XML)
- SQLite database
- Sensors + GPS tracking

Includes:

- Login system
- User registration
- Location tracking
- Alert system

VIII. RESULTS

The system provides:

- High accuracy in fall detection
- Fast response time
- Reduced false alarms
- Real-time monitoring

IX. ADVANTAGES

- Real-time monitoring
- High accuracy
- Low latency
- Secure data handling
- Easy to use

X. LIMITATIONS

- Requires wearable device
- Battery dependency
- Possible false detection in rare cases

XI. CONCLUSION

This paper presents an efficient IoT-based fall detection system using six-axis sensors and edge computing. The system ensures real-time monitoring, reduces response time, and improves elderly safety. Future work can include AI-based prediction for better accuracy.

REFERENCES

[1] D. Song et al., “Searchable Encryption,” IEEE, 2000.
[2] IoT and Healthcare Monitoring – ScienceDirect