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Fall Detection System for Vehicular and Mobile Communications

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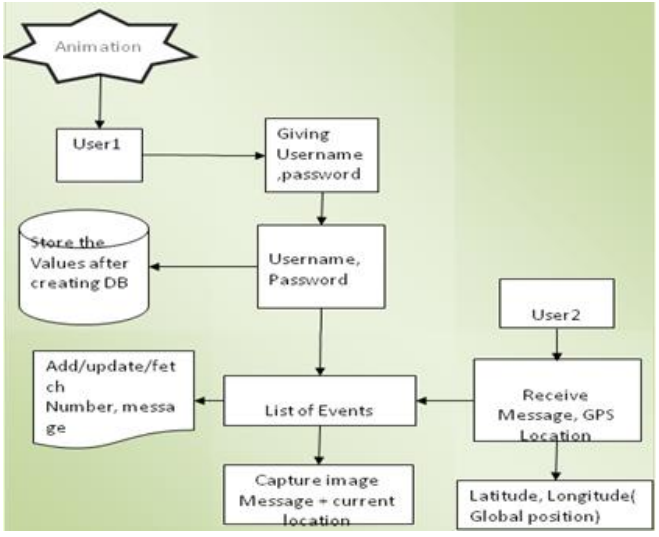
Abstract: ***The motive of this application is to develop a system that detects risk of falling to give immediate assistance to elder people after the occurrence of a fall accident. Delay or lack of medical care after the occurrence of a fall often results in injuries, sometimes severe, and can also lead to death in some cases. The quality of life of older people can be improved by using automatic fall detection systems. An application prototype is implemented on Android operating system and is used to evaluate the proposed technique. The hardware part consists of the fall detection sensor that detects the body position of the user whether it is on a falling mode. In addition, our system has a panic button that can be used in order to alert the emergency contacts in the event that the user feels that a fall may happen.***

1. Introduction

FALL accident has been the major cause of injury to the elderly in recent years. To protect the elderly from the injury of fall accident events or to give an immediate assistance to the elderly after the occurrence of a fall accident event, many researches have been devoted to the design of a fall detection algorithm and system. Among all the currently proposed algorithms, the fall detection system can be roughly divided into two categories, namely, environmental monitoring based, and wearable sensor-based systems. Digital Object Identifier pressure sensors or accelerometer for vibration detection are placed in a predefined space or environment to monitor the activities of the elderly as well as the occurrence of a fall accident event. Compared to the type of wearable sensor-based system, the environmental monitoring-based fall detection system is more comfortable to the elderly since there is no need of wearing any module. However, the environmental monitoring-based system can only function in a predefined environment where it is installed. Moreover, the protection of the private matters for the elderly is another problem and contention is usually discussed with the environmental monitoring-based system.

2. System Design



Objective

The objective of the project is to develop a system that detects a risk of falling. It aims at developing an architecture for the fall accident detection and corresponding wide area rescue system based on a smart phone and the third generation networks. To realize the fall detection algorithm, the angles acquired by the electronic compass and the waveform sequence of the tri axial accelerometer on the smart phone are used as the system inputs. The acquired signals are then used to generate an ordered feature sequence and then examined in a sequential manner by the proposed cascade classifier for recognition purpose. With the proposed cascaded classification architecture, the computational burden and power consumption issue on the smart phone system. It determines the status of the fall using the smart phone and sends the location obtained from the **GPS sensor** of the Smartphone.

Modules

- Login / Registration.
- Database Creation.
- Start Section.
- Check Motion for Mobile.
- Mobile Vibrating.

Module Description

Login & Registration:

In this module we design to develop login and signup screen. Android used xml to develop classical screens in our application. The modules describe signup page contains email id or user name, password and conform password those kind of details should be stored in database. Login screen contains email id or username and password when the user to login the app it should be retrieve the data to the database and combine based on user input if its match user name and password to allow in the app otherwise alert and show a message to the user.

Database Creation:

User email id or user name and password have been stored after registration. Android used SQLite Database for storing and fetching user application details

Start Section
This module starts section for detecting fall accident.

Check Motion for Mobile
The body posture is derived from change of acceleration in three axes, which is measured using tri axial accelerometer

Mobile Vibration
After accelerometer variation, device starts to vibrate.

Requirements
Software
Front End: ANDROID XML, JAVA
Back End : SQLITE
Operating System: Windows 07
IDE : Eclipse, Android Studio

Hardware
PROCESSOR: Intel Core i3.
RAM :4 GB DDR2 RAM
MONITOR : 15" COLOR
HARD DISK : 100 GB

3. Implementation

SQLITE
SQLite is a C-language library that implements a small, fast, self-contained, high-reliability, full-featured, SQL database engine. SQLite is the most used database engine in the world. SQLite is built into all mobile phones and most computers and comes bundled inside countless other applications that people use every day. The SQLite file format is stable, cross-platform, and backwards compatible and the developers pledge to keep it that way through at least the year 2050. SQLite database files are commonly used as containers to transfer rich content between systems and as a long-term archival format for data . There are over 1 trillion SQLite databases in active use .SQLite source code are in the public-domain and are free to everyone to use for any purpose.

SQLite is not directly comparable to client/server SQL database engines such as MySQL, Oracle, PostgreSQL, or SQL Server since SQLite is trying to solve a different problem.

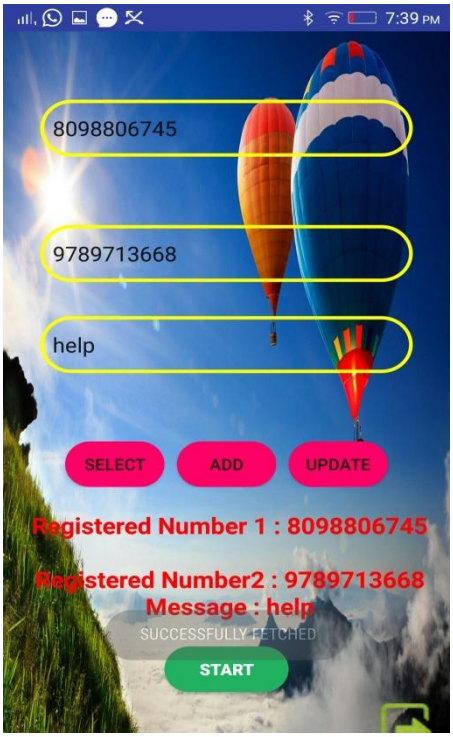
Client/server SQL database engines strive to implement a shared repository of enterprise data. They emphasize scalability, concurrency, centralization, and control. SQLite strives to provide local data storage for individual applications and devices. SQLite emphasizes economy, efficiency, reliability, independence, and simplicity.

Cache for enterprise data
Many applications use SQLite as a cache of relevant content from an enterprise RDBMS. This reduces latency, since most queries now occur against the local cache and avoid a network round-trip. It also reduces the load on the network and on the central database server. And in many cases, it means that the client-side application can continue operating during network outages.

Software Overview
Java is a platform independent. Java is a high level programming language introduced by Sun Microsystems in June 1995 Java is becoming a standard for interactive processing and for the use of graphics and animation on the internet. Since the internet consists of different types of computers and operating systems, a common language was needed to enable computers to run programs that run on multiple platforms. Java is an object-oriented language built upon C and C++. It derives its syntax from C and its object-oriented features are influenced by C++. Java can be used to create applications and applets. An application is a program that runs on the user's computer, under its operating system. An applet is a small window based program that runs on HTML page using Java enabled We browse like internet Explorer, Netscape Navigator, Hot Java or an applet view.

Features of JAVA
- Simple
- Object Oriented
- Platform independent
- Robust
- Secure
- Distributed
- Multithreaded

4. Result



5. Conclusion

We propose in this project a smart phone-based pocket fall accident detection system. The fall detection algorithm is realized with the proposed state machine that investigates the features in a sequential manner. Once the corresponding feature is verified by the current state, it can proceed to next state; otherwise, the system resets to the initial state and waiting for the appearance of another feature sequence. To speed up the efficiency of classification process, the early states are composed of simple and important features that allow a large number of negative samples to be quickly excluded from being regarded as a fall event.

6. Future Enhancements

Future use of fall detection we have develop live tracking to user find an accurate live location for to help and monitor the user to give medical support. Further it helps to avoid the more blood loss and major injuries.

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