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HUMAN FALL DETECTION SYSTEM IN ANDROID

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ABSTRACT:

The usage of technology has ended up being a value asset in the prosperity office. Nowadays, from PCs to mobile phones, advancement society in their activities, being these eventually or cooperativily. Because of these ideal circumstances, new research has make to make structures and applications to help with people's prosperity, for our circumstance recognizing fall incidents with the usage of mobile phones. This paper acquaints a route with manage recognize falls using unmistakable proposed computations with the target of peopling with their prosperity and security. The system is made out of three one of a kind fragments: data gathering, range decision, and fall ID. It utilizes the wireless' intrinsic sensors (accelerometer, whirligig) to recognize the region of the mobile phone in the customer's body (mid-segment, pocket, holster, et cetera.) and once a zone is perceived, the fall distinguishing proof portion happens. A general depiction on fall area systems is given, including the differing sorts of sensors used nowadays. The proposed course of action is presented and depicted in wonderful unobtrusive component. A total accuracy of 81.3% was found out from the fall distinguishing proof proposed computation. The primary three regions to recognize a fall were: informing with a 95.8% fall area accuracy, pants' side pocket with a 87.5% precision, and shirt mid-segment pocket with a 83.3% precision. In like manner an extra study was done using only the holster territory making an awesome 100% region decision accuracy.

Keywords- GPS, Tri axial accelerometer, Electronic compass, Gyro meter, Rescue Center and Caregiver

1. INTRODUCTION:

Current search engines fail to utilize one important aspect of the relevance the location of the user because of two main reasons. Firstly, the location of the user was not as widely available as nowadays due to GPS phones being less frequent. Secondly, the information in web is rarely attached with the location for which it would be relevant. Introduce an alternative

solution referred to as location based search engine based on the ideas in with the following practical solutions. For a given location (e.g. From GPS), we perform location-restricted web query, analyze the web-pages found (relevant by keyword), extract potential address information and compare them to the entries in a gazetteer. Positive results are presented according to their distance relative to the user location, plotting the target location on map or giving navigational information to the location.

2. PROBLEM STATEMENT:

In recent years, the fall accident among elderly people is considered as the main cause of injury. To overcome this situation Wearable sensor based systems were introduced to assist and protect them in occurrence of such fall accidents. These system works on the basis of single tri axial accelerometer due to which pseudo fall events were analysed from normal activities such as Walk, Run, Jump, Tread, Go upstairs and Go downstairs that generated negative results over the existing system.

3. EXISTING METHOD:

- It is the design and development of an electronic gadget which is used to detect fall among elderly people who are prone to it.
- The body posture is derived from change of acceleration in three axes, which is measured using tri axial accelerometer.
- The existing algorithm is State-of-the-art wearable fall detection algorithm.

3.1 STATE-OF-THE-ART WEARABLE FALL DETECTION ALGORITHM:

Definition:
Detection algorithm depends mainly on the body posture and tilt, and then torso is more suitable place.

Different possible anatomical positions are listed to derive various postures for fall detection.

3.2 DRAWBACKS:

- The major drawback is that only the Rescue Center will be intimated about the fall detection.
- Embedded system is a separate device which cannot be carried all the time.
- They have less accuracy**.**

3.3 RELATED WORK:

“ROBUST VIDEO SURVEILLANCE FOR FALL DETECTION BASED ON HUMAN SHAPE DEFORMATION”

Caroline Rougier, Jean Meunier, Alain St-Arnaud, and Jacqueline Rousseau, 2013

- A new method is proposed to detect falls by analyzing human shape deformation during a video sequence.

- A shape matching technique is used to track the person's silhouette along the video sequence.
- The shape deformation is then quantified from these silhouettes based on shape analysis methods.
- Finally, falls are detected from normal activities using a Gaussian mixture model.

"HMM-BASED HUMAN FALL DETECTION AND PREDICTION METHOD USING TRI-AXIAL ACCELEROMETER"

Lina Tong, Quanjun Song, Yunjian Ge and Ming Liu , 2013

- It focuses on designing a system that prevents a patient from falling down when he/she is unconsciousness.
- Two accelerating sensors are used to detect the position of patient who has met an accident.
- Front and Back fall detection is detected using x axis of accelerating sensor and Left and Right fall detection is detected using y axis of accelerating sensor.

"CHAMELEON: PERSONALISED AND ADAPTIVE FALL DETECTION OF ELDERLY PEOPLE IN HOME-BASED ENVIRONMENTS"

Lingmei Ren, 2008

- Threshold-based fall detection has been widely adopted in conventional fall detection systems.
- In this survey, it is discussed that a fixed threshold is not flexible enough for different people.
- By exploiting the personalised and adaptive threshold, it proposes a novel threshold extraction model, which meets being adaptive to detect a fall, while only taking consideration of data from activity of daily living (ADL).
- To evaluate the performance of this threshold extraction model, Chameleon with advanced magnitude detection (AMD) and fixed and tracking fall detection (FTFD) is compared.

"DETECTING FALLS WITH WEARABLE SENSORS USING MACHINE LEARNING TECHNIQUES"

Ahmet Turan Özdemir, Billur Barshan , 2014.

- Falls are a serious public health problem and possibly life threatening for people in fall risk groups.
- An automated fall detection system with wearable motion sensor units fitted to the subjects' body at six different positions is developed here.
- Each unit comprises three tri-axial devices (accelerometer, gyroscope, and magnetometer/compass).

"A SURVEY ON AMBIENT-ASSISTED LIVING TOOLS FOR OLDER ADULTS"

Parisa Rashidi and Alex Mihailidis, 2009

- In recent years, a rapid surge is witnessed in assisted living technologies due to a rapidly aging society.

- The aging population, the increasing cost of formal health care, the caregiver burden, and the importance that the individuals place on living independently, all motivate development of innovative-assisted living technologies for safe and independent aging.
- In this survey, the emergence of 'ambient-assisted living" (AAL) tools for older adults based on ambient intelligence paradigm is summarized.

4. PROPOSED METHOD:

- The proposed algorithm used is Fall Detection algorithm.
- The proposed system is to rescue an individual from the injury of fall accident events or to give an immediate assistance to them after the occurrence of a fall accident event.

4.1 FALL DETECTION ALGORITHM:

Definition:
The angles acquired by the electronic compass (compass) and the waveform sequence of the tri axial accelerometer on the smart phone are used as the system inputs.

Sensors that are used to detect the fall are

- Tri axial accelerometer
- Electronic Compass
- Gyro meter

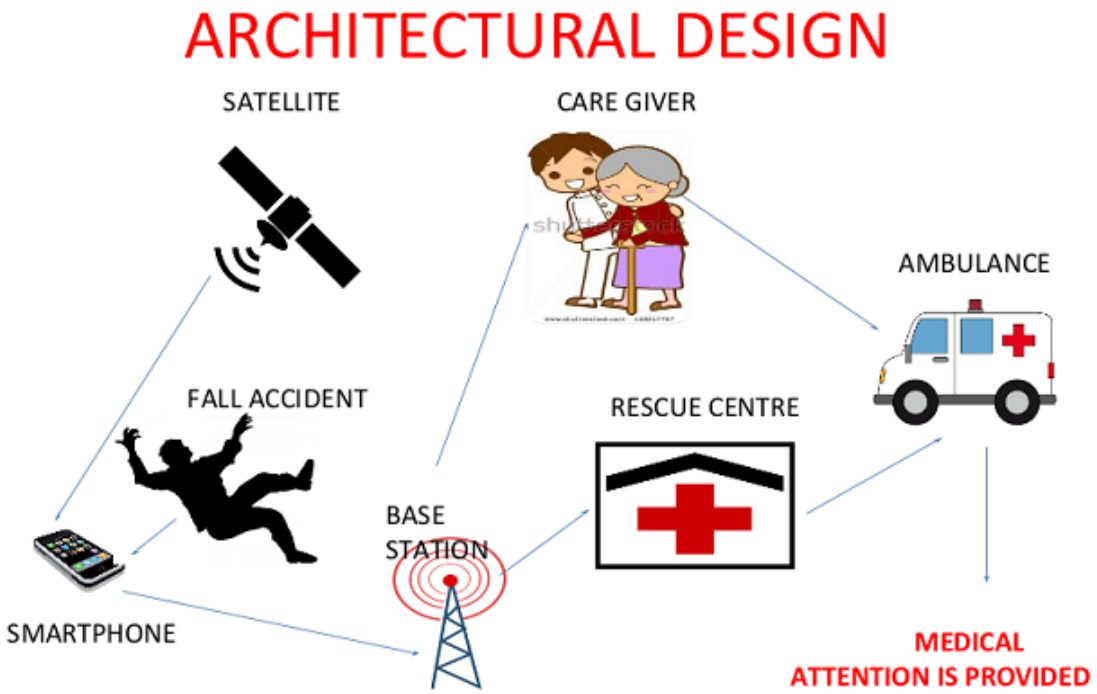
4.2 ADVANTAGES:

- This can be carried everyday using hand held device that is the mobile.
- Both the Caregiver and the Rescue Center are intimated about the fall detection.
- Enhanced Accuracy.
- More comfortable.

5. IMPLEMENTATION:

5.1 SYSTEM ARCHITECTURE:

- Once the human fall is detected with the fall of mobile, this application keeps track of location using GPS and Sms is sent to the caregiver and the Rescue center so that immediate medical assistance can be provided.



5.2 LOGIN AND REGISTRATION

Input: User name and Password will be given.
Output: *Registered successfully/ Password doesn't match* for new users,
Login successfully/ Invalid Username or Password for the existing users.

- In this module, registration of a new user and login of the existing user is discussed.
- Any individual can sign up and register using a username and password to create his/her own account in the application.
- Once the registration is completed and the account is created, all the details are stored in the database for further references and use.

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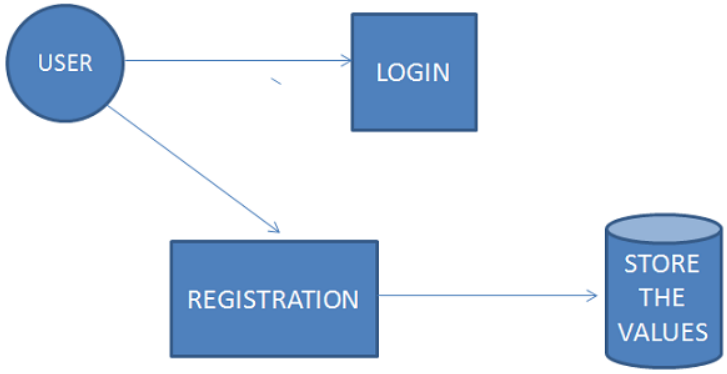
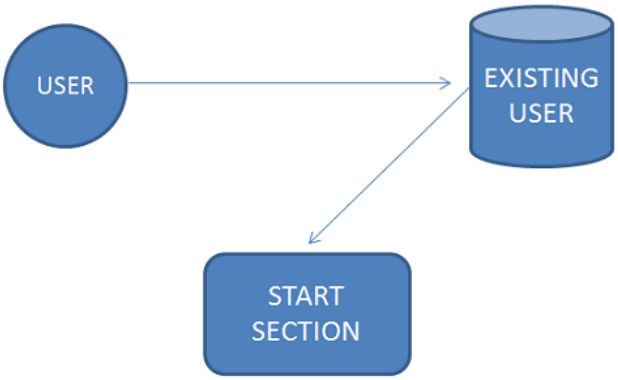
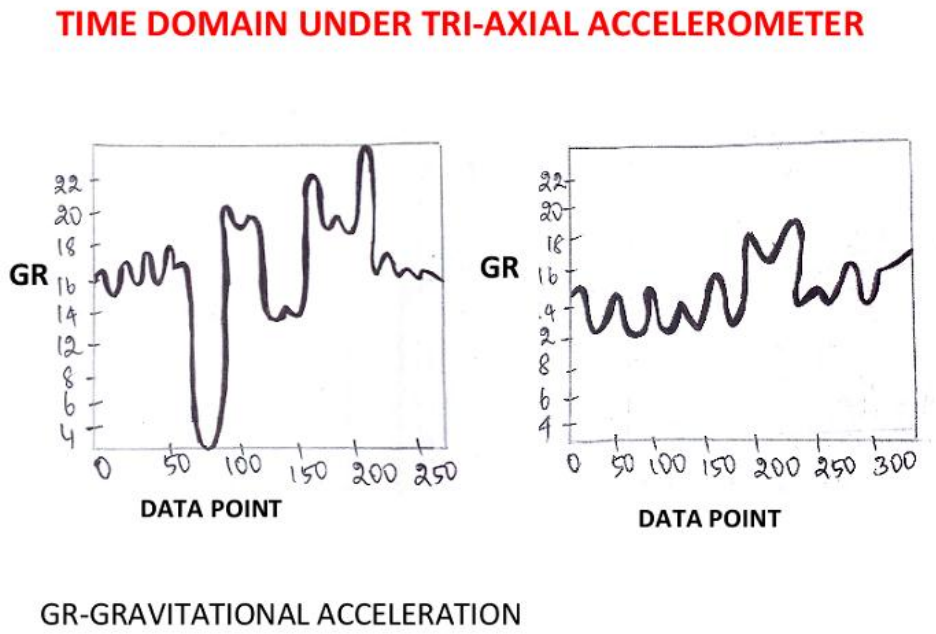


5.3 START SECTION

Input: After login, Authenticated user goes to the Home screen to add Caregiver number and desired message to be sent which can be updated anytime.
Output: User views start section and stored numbers.

- Once the fall accident is suspected with the fall of the phone, the sensors need to track the motion of fall so that the event can be verified as true or false.
- This is possible only when the motion of fall is analysed from the beginning of the fall event which is considered as the start section.

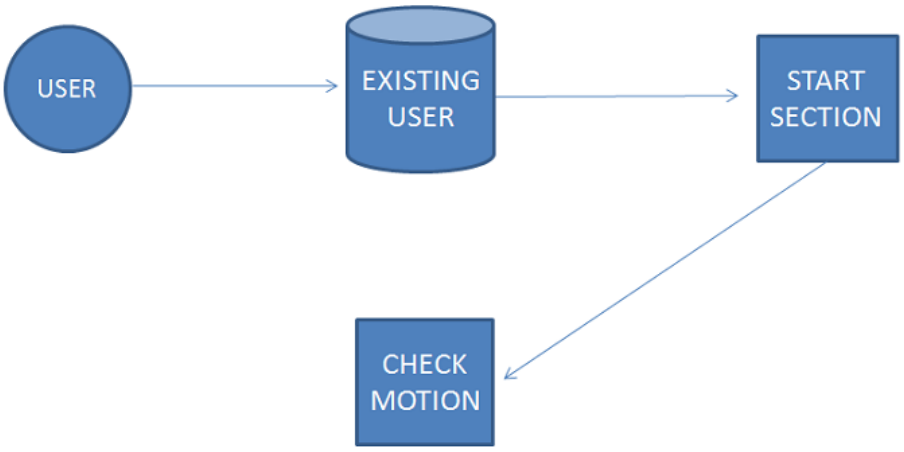


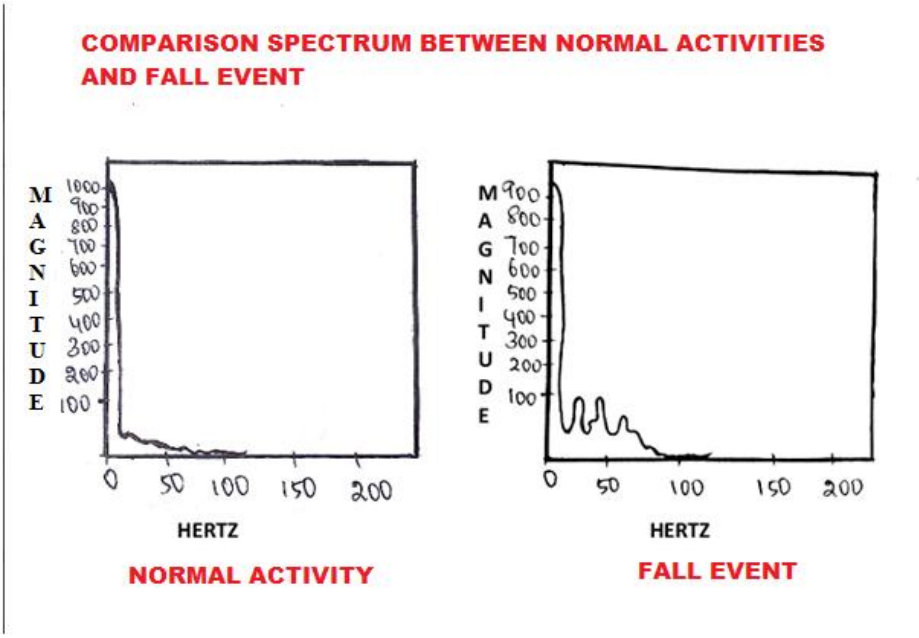


5.4 CHECK MOTION FOR THE MOBILE

Input: After start activity, user can find motion variation from change of acceleration in three axes, which is measured using tri axial accelerometer.
Output: User views accelerometer changes.

- When the start section is analysed, the values that are determined at the time of fall is compared against the predefined values which is stored in the database.
- This is to ensure whether the fall accident has occurred or not.
- The motion is checked by comparing the determined values with the predefined values from which the fall accident is proven to be false if they match each other.





5.5 MOBILE VIBRATION

Input: Based on accelerometer variation, vibration starts
Output: Auto Sms send to protect from accident

- When the motion of fall is checked for analysis of the fall accident and if the determined values don't match with the predefined values then the fall accident is identified.
- Once the fall accident is identified, the mobile gets vibrated and the event is notified in the form of sms to the caregiver and the rescue center.

6. CONCLUSION:

The proposed algorithm is derived in such a way that it examines features in an orderly fashion in the form of states where the initial state has to be verified to move towards the next state. Hence fall detection can be further improved in terms of accuracy and efficiency which provides precise indication about the location of the fall people as well the fall accident.

7. FUTURE ENHANCEMENT:

As a part of futuristic development, well designed smart sensor system to detect falls can be both medically and economically helpful. This research may introduce a portable terrain adaptable fall detection system, by placing accelerometers and gyroscopes in parts of the body and transmit data through wireless transmitter modules to mobile devices to get the related information.

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BIOGRAPHY

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