

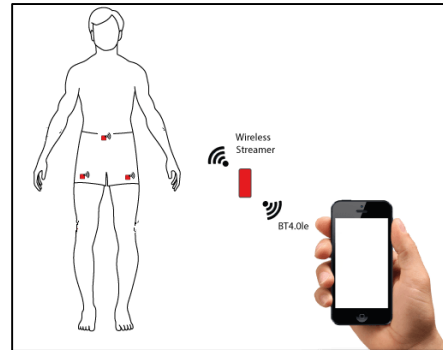
CMPT 733 Big Data Programming – Final Project

Call for Project Idea

Title of the Project: Fall Detection using wearable sensor data

Description:

About 70% of falls happening for the elderly results in unconsciousness or confusion, rendering them unable to call for help themselves. It would be beneficial if we can automatically detect when a fall happen using sensor (APDM wearable sensor in this project). We want to understand the feasibility and accuracy of using acceleration data captured from body worn sensors to detect fall so that necessary alert/help can be activated.



In the simplest form, the project can be to analyze the below dataset and develop the best machine learning model to classify whether a record is Fall or Non-Fall. Ideally, we want to have no false positive and still have acceptable true positive rate (at least 90%).

If students have time, there are other things we can do using the dataset:

- Predict fall instead of detecting fall. That means we try to “detect” fall before the fall impact happens
- Simulate real-life scenario in which sensor data is continuously generated and we need to find a way to handle the data streaming and apply a machine learning model to detect fall

Datasets

The Inertial Measurement Unit Fall Detection Dataset (IMU Dataset) is available on SFU RADAR:

<https://researchdata.sfu.ca/islandora/object/islandora%3A9085>

Inertial Measurement Unit Fall Detection Dataset (IMU Dataset) is a dataset devised to benchmark fall detection and prediction algorithms based on acceleration, angular velocity and magnetic fields of body-worn APDM Opal IMU sensors at 7 body locations (right ankle, left ankle, right thigh, left thigh, head, sternum, and waist).

Detailed description and relevant research paper are in Readme.txt file.

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