REAL TIME FALL DETECTION APP

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Agenda

- Challenge
- Problem statement
- Research work
- Workflow
- Solution
- Use cases/Applicability
- Business Model Canvas
- Credits

Challenge

To create a system that can detect falls with high accuracy, respond quickly and effectively, and provide a user-friendly experience that can be trusted and adopted by the elderly and people with mobility issues.

Problem statement

- **Description of the Idea:** Accidents related to falling or car accidents is a major issue in India

- It is important that a person that suffers an accident is aided as quickly as possible.

- Unable to call for help as the person can be injured or unconscious.

- Purpose: to examine the possibility of using sensors available in smartphones to implement an application for fall detection.

- Send an automatic alert notification could be of great use.

Research work

- How Rishabh Pant was rescued: 'The car had already caught sparks so I and the conductor rushed to get him out'

- Globally, an average of 37.3 million people suffer from injuries related to a fall each year, which are severe enough to seek medical attention.

- Out of these, no less than an estimated 640000 individuals die as a direct consequence of the fall.
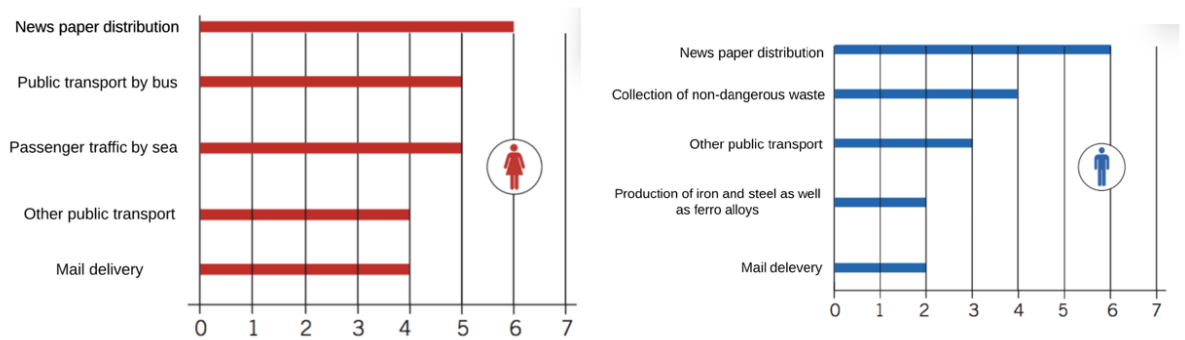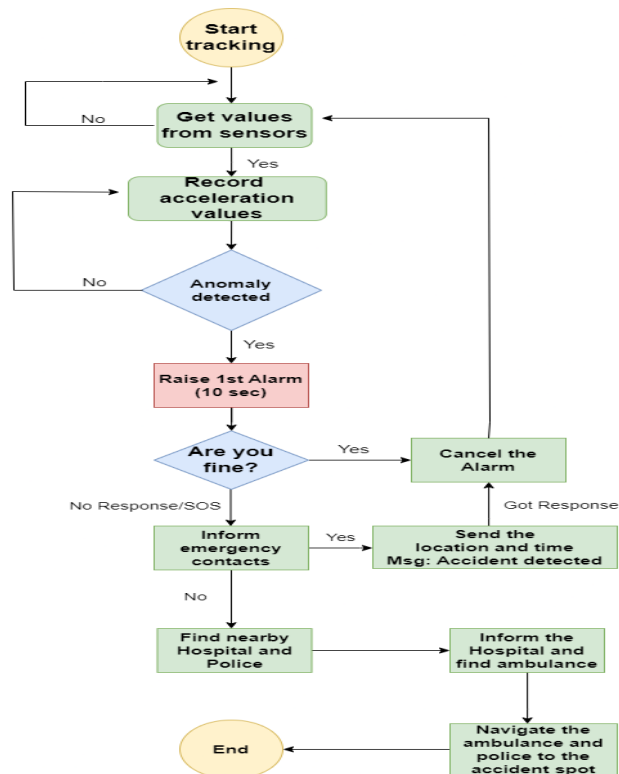

Fig:1 Work areas with most reported fall accidents from standing level. Amount per 1000 employed women and men respectively

Workflow

Solution

- A fall detection app is a mobile application designed to detect and respond to falls, by using sensors in a smartphone or wearable device.

- It can alert emergency contacts or send a call for help in case of a fall.

- Provide a fast and reliable way to get help in the event of a fall, especially for elderly or vulnerable individuals who may have trouble getting up after a fall or calling for help.

- The application will read real-time data using smartphone sensors and location services.

- Accelerometer and gyroscope data signals are then fed to a model. The model detects anomalies in the data and predicts a fall.

- After a fall is predicted an alert notification will be sent to the user and if the user does not respond, an SOS will be sent to the emergency contact.
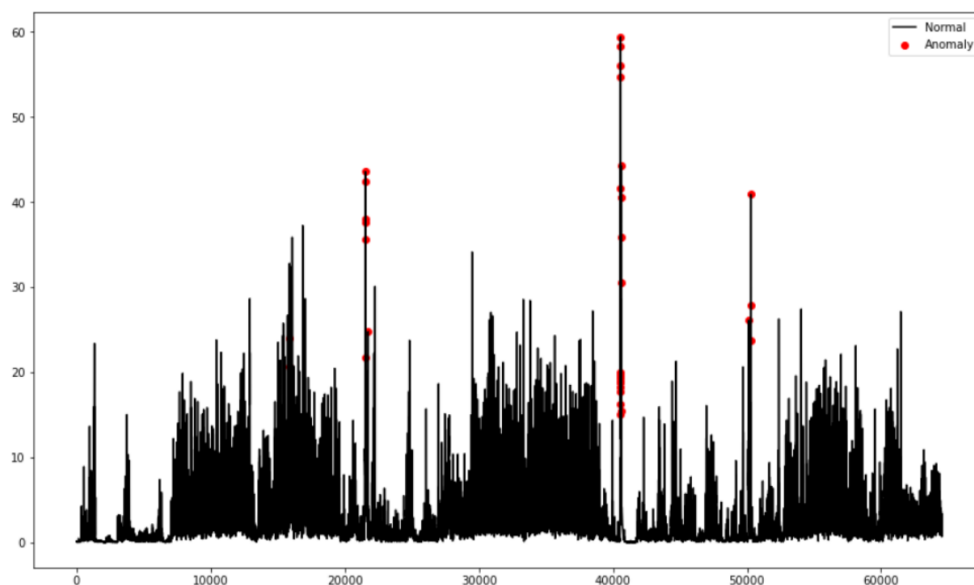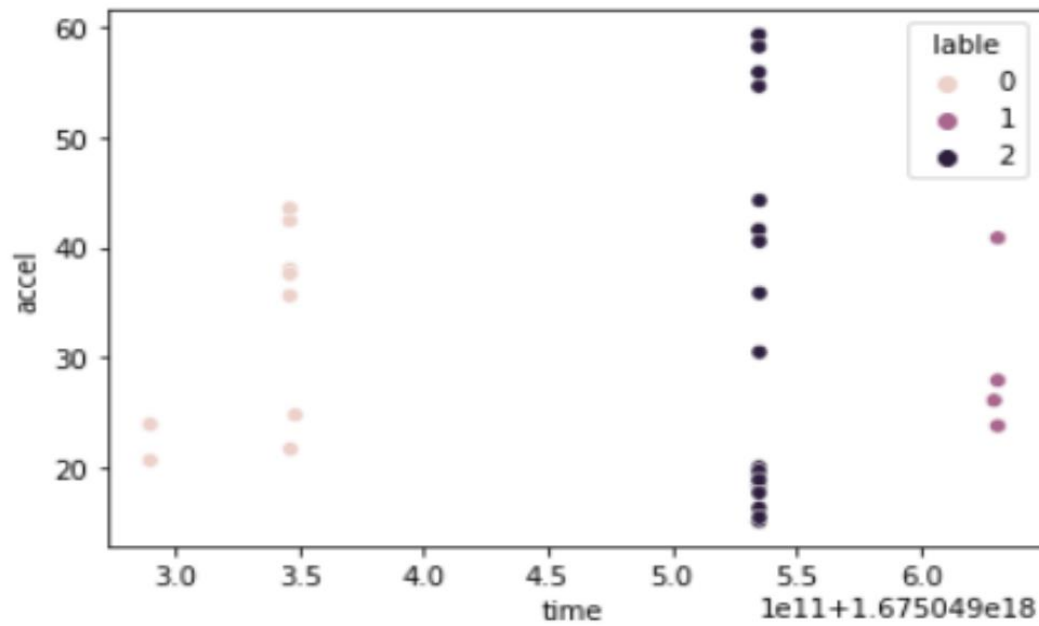
Solution
(code snippets)

```python
if sensor_data['anomaly'].value_counts()[-1]>5:
    anom_point = sensor_data.loc[sensor_data['anomaly'] == -1]
    time = anom_point['time'].take([5])
    print('fall detected at time ',time)
```

```
fall detected at time  21522    1675049346171972400
Name: time, dtype: int64
```

- Isolation Forest Training Model

USE CASES / APPLICABILITY

- **Elderly Care**
- **Health Monitoring**
- **Sports & Adventure Activities**
- **Industrial Safety**
- **Smart Homes**

Business Model Canvas