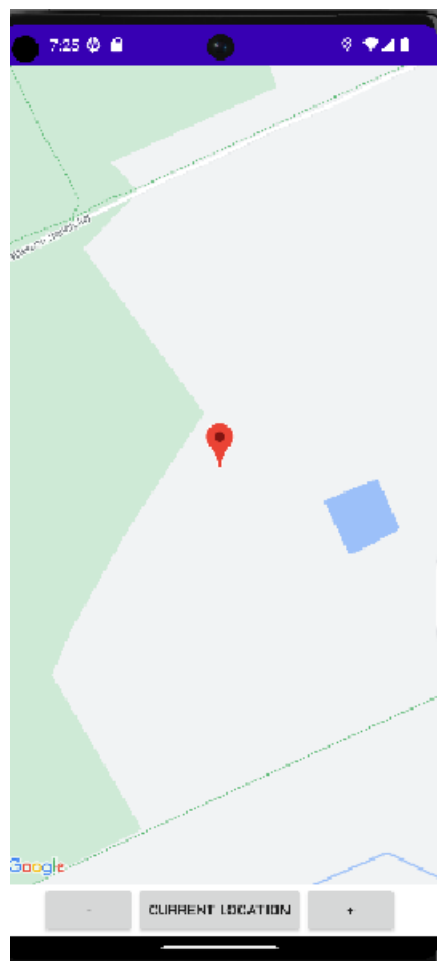


Low Power Location Tracking App

Approach

The initial reading of the location was obtained using the GPS sensor, which provided an approximate location. Later on, to update the location with greater accuracy, the accelerometer was used. The accelerometer provided continuous updates to the location as the device was moving, but its accuracy degraded over time due to sensor noise and other factors. To correct for this error, the GPS sensor was used again after a certain period of time to provide an accurate reading and correct the location. This iterative approach using both the GPS sensor and the accelerometer helped to ensure that the location data was as accurate as possible.

UI



OnLocationUpdated - used for fetching GPS locations.

OnSensorChange - used to fetch accletrometry readings.

Fetches displacement from acclemetry using the $0.5 \cdot v \cdot t$ formula

Here's code

```
float[] filteredAcceleration = {
    event.values[0] ,
    (float) (event.values[1] - 9.8),
    event.values[2]
};

// Calculate the time elapsed since the last sensor reading
presentTime = System.currentTimeMillis();
differTime = (presentTime - lastTime) / 1000.0f;
lastTime = presentTime;

// Integrate the linear acceleration to estimate the velocity and displacement
for (int i = 0; i < 3; i++) {
    sensorVelocity[i] += filteredAcceleration[i] * differTime;
    sensorPosition[i] += sensorVelocity[i] * differTime + 1/2 * filteredAcceleration[i]
* Math.pow(differTime,2);
}

// Update the distance traveled variable
sensorDistance = (float) Math.sqrt(Math.pow(sensorPosition[0],2) +
Math.pow(sensorPosition[1],2) + Math.pow(sensorPosition[2],2));
```