PROYECTO FINAL – SENSORES

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Acelerómetro

Código de MainActivity.java

```
package com.example.semestral;

        import java.util.List;

        import android.app.Activity;
        import android.content.pm.ActivityInfo;
        import android.hardware.Sensor;
        import android.hardware.SensorEvent;
        import android.hardware.SensorEventListener;
        import android.hardware.SensorManager;
        import android.os.Bundle;
        import android.util.Log;
        import android.widget.TextView;
        import android.widget.Toast;

public class MainActivity extends Activity implements SensorEventListener {
    private long last_update = 0, last_movement = 0;
    private float prevX = 0, prevY = 0, prevZ = 0;
    private float curX = 0, curY = 0, curZ = 0;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

this.setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_PORTRAIT);
    }

    @Override
    protected void onResume() {
        super.onResume();
        SensorManager sm = (SensorManager) getSystemService(SENSOR_SERVICE);
        List<Sensor> sensors = sm.getSensorList(Sensor.TYPE_ACCELEROMETER);
        if (sensors.size() > 0) {
            sm.registerListener(this, sensors.get(0),
SensorManager.SENSOR_DELAY_GAME);
        }
    }

    @Override
    protected void onStop() {
        SensorManager sm = (SensorManager) getSystemService(SENSOR_SERVICE);
        sm.unregisterListener(this);
```

```
        super.onStop();
    }

    @Override
    public void onAccuracyChanged(Sensor sensor, int accuracy) {}

    @Override
    public void onSensorChanged(SensorEvent event) {
        synchronized (this) {
            long current_time = event.timestamp;

            curX = event.values[0];
            curY = event.values[1];
            curZ = event.values[2];

            if (prevX == 0 && prevY == 0 && prevZ == 0) {
                last_update = current_time;
                last_movement = current_time;
                prevX = curX;
                prevY = curY;
                prevZ = curZ;
            }

            long time_difference = current_time - last_update;
            if (time_difference > 0) {
                float movement = Math.abs((curX + curY + curZ) - (prevX -
prevY - prevZ)) / time_difference;
                int limit = 1500;
                float min_movement = 1E-6f;
                if (movement > min_movement) {
                    if (current_time - last_movement >= limit) {
                        Toast.makeText(getApplicationContext(), "Hay
movimiento de " + movement, Toast.LENGTH_SHORT).show();
                    }
                    last_movement = current_time;
                }
                prevX = curX;
                prevY = curY;
                prevZ = curZ;
                last_update = current_time;
            }


            ((TextView) findViewById(R.id.txtAccX)).setText("ACELEROMETRO X:
" + curX);
            ((TextView) findViewById(R.id.txtAccY)).setText("ACELEROMETRO Y:
" + curY);
            ((TextView) findViewById(R.id.txtAccZ)).setText("ACELEROMETRO Z:
" + curZ);
        }

    }

}
```

Código de activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/container"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingTop="?attr/actionBarSize">


    <TextView
        android:id="@+id/txtAccX"
        android:layout_width="fill_parent"
        android:layout_height="39dp"
        android:text="Valor de X"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.088" />

    <TextView
        android:id="@+id/txtAccY"
        android:layout_width="fill_parent"
        android:layout_height="43dp"
        android:text="Valor de Y"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.204" />

    <TextView
        android:id="@+id/txtAccZ"
        android:layout_width="fill_parent"
        android:layout_height="36dp"
        android:text="Valor de Z"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.31" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="ACELEROMETRO"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Captura de funcionamiento