# HCIM Summer Workshop

## Android Sensors

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## Challenges

1. *Positions of the device*
2. *Shake the devive*

### *Positions of the device*

```
 <TextView
     android:id="@+id/position"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_below="@+id/z"
     android:text="POS: 0.0" />
```

```
TexView position;

tabletPosition(event.values[0],event.values[1],event.values[2]);

public void tabletPosition(float sensorX, float sensorY, float sensorZ) {
   if (sensorZ > 9 && sensorZ < 10) {
                  position.setText("POS: " + "Horizontal");
   } if ((sensorY > 9 && sensorY < 10)) {
                  position.setText("POS: " + "Vertical");
            } if ((sensorZ > 0 && sensorZ < 9) && (sensorY < 9 && sensorY
   > 0)) {
                  position.setText("POS: " + "Diagonal");
            }
   }
```

### *Shake the device*

```
   private float mAccel; // acceleration apart from gravity
   private float mAccelCurrent; // current acceleration including gravity
   private float mAccelLast; // last acceleration including gravity

   float sensorX,sensorY, sensorZ;

   mAccel = 0.00f;
   mAccelCurrent = SensorManager.GRAVITY_EARTH;
   mAccelLast = SensorManager.GRAVITY_EARTH;

   if (arg0.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
                  sensorX = arg0.values[0];
                  sensorY = arg0.values[1];
```

```
                    sensorZ = arg0.values[2];

        mAccelLast = mAccelCurrent;
        mAccelCurrent = (float) Math.sqrt((double) (sensorX * sensorX
                                + sensorY * sensorY + sensorZ * sensorZ));

        float delta = mAccelCurrent - mAccelLast;

        mAccel = mAccel * 0.9f + delta; // perform low-cut filter
    }

if (mAccel > 2.0) {
        shake();
}

private void shake() {
        //do things*
}
```

*Do things can be, ex. changing the background from your app

1. `RelativeLayout myLayout;`
2. **Activity_main.xml**

```
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/myLayout"
...
```

3. `myLayout = (RelativeLayout) findViewById(R.id.myLayout);`

4. `myLayout.setBackgroundColor(Color.WHITE);`

Ex.

```
private void shake() {
        Random random = new Random();
                    int myRandom = random.nextInt() % 4;
            switch (myRandom) {
            case 0:
                    myLayout.setBackgroundColor(Color.YELLOW);
                break;
            case 1:
                    myLayout.setBackgroundColor(Color.GREEN);
                break;
            case 2:
                    myLayout.setBackgroundColor(Color.RED);
                break;
            case 3:
                    myLayout.setBackgroundColor(Color.CYAN);
                break;
             default:
               myLayout.setBackgroundColor(Color.WHITE);
                  break;
            }
    }
```

```
Vibrator v = (Vibrator) getSystemService(Context.VIBRATOR_SERVICE);
// Vibrate for 500 milliseconds
v.vibrate(200);


<uses-permission android:name="android.permission.VIBRATE"/>
```