

SPV - Projekt

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Inhalt

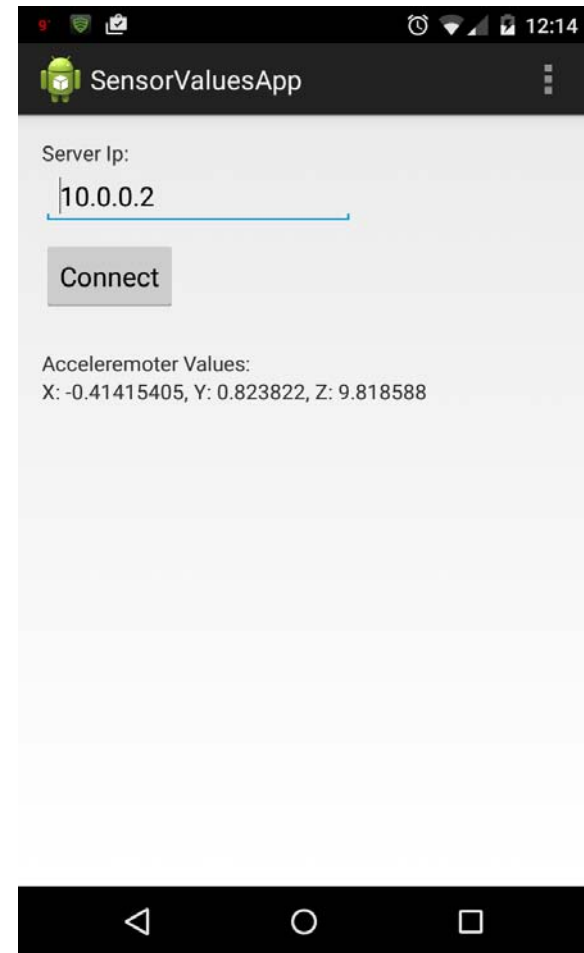
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- Android Applikation
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Projektziel

- Auslesen von Sensordaten mittels Android
- Kommunikation der Sensordaten zwischen Android und der WPF Anwendung
- Visuelle Darstellung der Sensordaten

Android Applikation

- Textfeld zur Ip Eingabe
- Button für Verbindungsaufbau
- Testausgabe



Android Applikation

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_sensor_values);

    senSensorManager = (SensorManager) getSystemService(Context.SENSOR_SERVICE);
    senAccelerometer = senSensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER);
    senSensorManager.registerListener(this, senAccelerometer, SensorManager.SENSOR_DELAY_NORMAL);
}

protected void onPause() {
    super.onPause();
    senSensorManager.unregisterListener(this);
}

protected void onResume() {
    super.onResume();
    senSensorManager.registerListener(this, senAccelerometer, SensorManager.SENSOR_DELAY_NORMAL);
}
```

Android Applikation

```
@Override
public void onSensorChanged(SensorEvent event) {
    Sensor mySensor = event.sensor;

    if (mySensor.getType() == Sensor.TYPE_ACCELEROMETER) {
        float x = event.values[0];
        float y = event.values[1];
        float z = event.values[2];

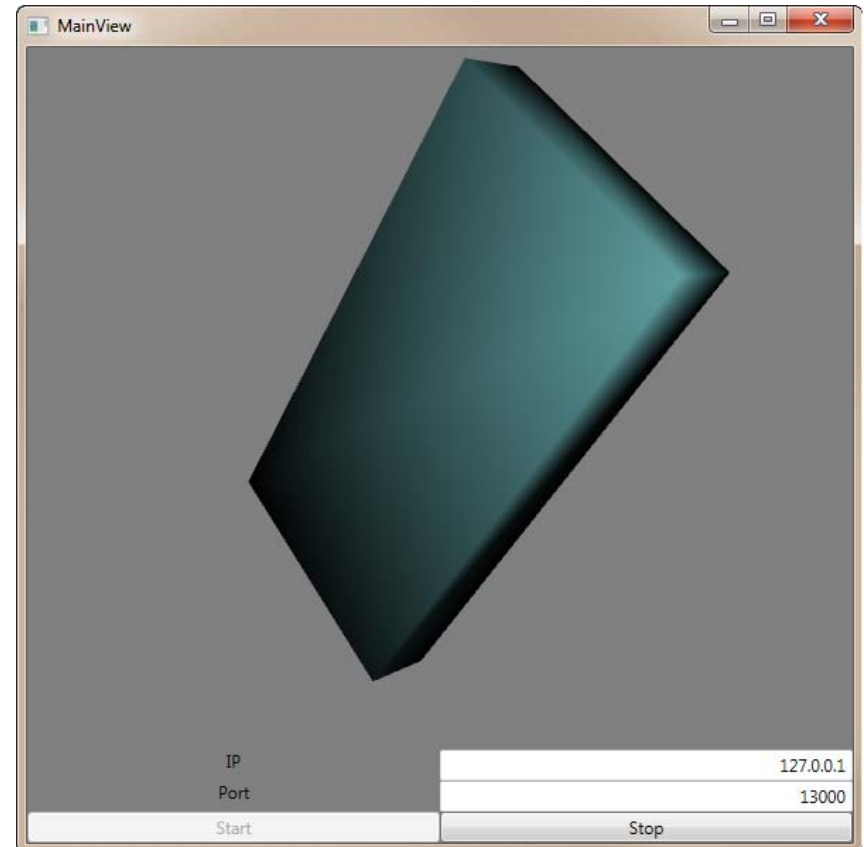
        long curTime = System.currentTimeMillis();

        if ((curTime - lastUpdate) > 100) {
            lastUpdate = curTime;

            TextView textView = (TextView) findViewById(R.id.lblAccelerometerValues);
            textView.setText(String.format("X: %s, Y: %s, Z: %s", x, y, z));
        }
    }
}
```

WPF Anwendung

- Darstellung der Lage im Raum mittels Beschleunigungssensordaten
- 3D Objekt rendern



WPF Anwendung

```
<Viewport3D x:Name="Viewport" Grid.Row="0">
  <Viewport3D.Camera>
    <PerspectiveCamera x:Name="ZeroCamera" Position="3 2.125 2.5" LookDirection="-1 -1 -1" />
  </Viewport3D.Camera>

  <ModelVisual3D x:Name="TopModelVisual3D">
    <ModelVisual3D.Children>
      <ModelVisual3D>
        <ModelVisual3D.Content>
          <DirectionalLight x:Name="DirLightMain" Direction="-1,-1,-1">
          </DirectionalLight>
        </ModelVisual3D.Content>
      </ModelVisual3D>
    </ModelVisual3D.Children>
  </ModelVisual3D>
</Viewport3D>
```


WPF Anwendung

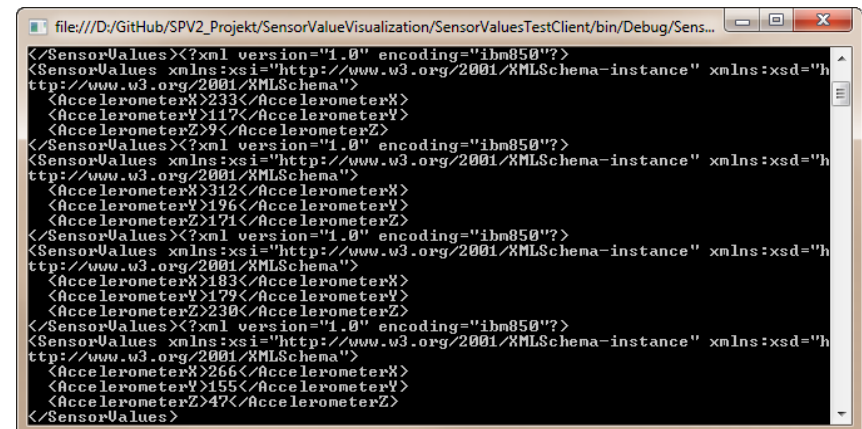
```
<ModelVisual3D.Content>
  <GeometryModel3D>
    <GeometryModel3D.Geometry>
      <MeshGeometry3D x:Name="MeshMain"
        Positions="0 0 0  2 0 0  0 0.25 0  2 0.25 0  0 0 1  2 0 1  0 0.25 1  2 0.25 1"
        TriangleIndices="2 3 1  2 1 0  7 1 3  7 5 1  6 5 7  6 4 5  6 2 0  6 0 4  2 7 3  2 6 7  0 1 5  0 5 4">
      </MeshGeometry3D>
    </GeometryModel3D.Geometry>
    <GeometryModel3D.Material>
      <DiffuseMaterial>
        <DiffuseMaterial.Brush>
          <SolidColorBrush Color="CadetBlue"/>
        </DiffuseMaterial.Brush>
      </DiffuseMaterial>
    </GeometryModel3D.Material>
  </GeometryModel3D>
</ModelVisual3D.Content>
```

WPF Anwendung

```
<ModelVisual3D.Transform>
  <Transform3DGroup>
    <Transform3DGroup.Children>
      <RotateTransform3D CenterX="1" CenterY="0.125" CenterZ="0.5">
        <RotateTransform3D.Rotation>
          <AxisAngleRotation3D Axis="1 0 0" Angle="{Binding AccelerometerX}" />
        </RotateTransform3D.Rotation>
      </RotateTransform3D>
      <RotateTransform3D CenterX="1" CenterY="0.125" CenterZ="0.5">
        <RotateTransform3D.Rotation>
          <AxisAngleRotation3D Axis="0 1 0" Angle="{Binding AccelerometerY}" />
        </RotateTransform3D.Rotation>
      </RotateTransform3D>
      <RotateTransform3D CenterX="1" CenterY="0.125" CenterZ="0.5">
        <RotateTransform3D.Rotation>
          <AxisAngleRotation3D Axis="0 0 1" Angle="{Binding AccelerometerZ}" />
        </RotateTransform3D.Rotation>
      </RotateTransform3D>
    </Transform3DGroup.Children>
  </Transform3DGroup>
</ModelVisual3D.Transform>
```

Testclient

- Zufallsgenerierte Testwerte an WPF Anwendung senden
- Testwerte als XML gepackt



```
file:///D:/GitHub/SPV2_Projekt/SensorValueVisualization/SensorValuesTestClient/bin/Debug/Sens...
</SensorValues><?xml version="1.0" encoding="ibm850"?>
<SensorValues xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="h
tp://www.w3.org/2001/XMLSchema">
  <AccelerometerX>233</AccelerometerX>
  <AccelerometerY>117</AccelerometerY>
  <AccelerometerZ>9</AccelerometerZ>
</SensorValues><?xml version="1.0" encoding="ibm850"?>
<SensorValues xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="h
tp://www.w3.org/2001/XMLSchema">
  <AccelerometerX>312</AccelerometerX>
  <AccelerometerY>196</AccelerometerY>
  <AccelerometerZ>171</AccelerometerZ>
</SensorValues><?xml version="1.0" encoding="ibm850"?>
<SensorValues xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="h
tp://www.w3.org/2001/XMLSchema">
  <AccelerometerX>183</AccelerometerX>
  <AccelerometerY>179</AccelerometerY>
  <AccelerometerZ>230</AccelerometerZ>
</SensorValues><?xml version="1.0" encoding="ibm850"?>
<SensorValues xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="h
tp://www.w3.org/2001/XMLSchema">
  <AccelerometerX>266</AccelerometerX>
  <AccelerometerY>155</AccelerometerY>
  <AccelerometerZ>47</AccelerometerZ>
</SensorValues>
```

ToDo

- Kommunikation zwischen Android App und WPF Anwendung
- Auslesen und darstellen von mehreren Sensordaten