

File - C:\Users\hs\_kroeber\AndroidStudioProjects\vibration\_tamper\app\src\main\java\com\kroeber\vibration\_tamper\MainActivity.java

```
1 package com.kroeber.vibration_tamper;
2 // entstanden aus asom16_2
3
4 import android.os.Bundle;
5 import android.app.Activity;
6 import android.content.pm.ActivityInfo;
7 import android.view.Menu;
8 import android.widget.RelativeLayout;
9
10 public class MainActivity extends Activity {
11
12     private Up1 zview;
13
14     @Override
15     protected void onCreate(Bundle savedInstanceState) {
16         super.onCreate(savedInstanceState);
17         setContentView(R.layout.activity_main);
18
19         // setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_LANDSCAPE);
20         setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_PORTRAIT);
21
22         zview=new Up1(this);
23         RelativeLayout layout = (RelativeLayout) findViewById(R.id.RelativeLayout);
24         layout.addView(zview);
25     }
26 }
```

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```
1 package com.kroeber.vibration_tamper;
2
3 /**
4  * Created by hs_kroeber on 19.09.2016.
5  */
6 import android.content.Context;
7 import android.graphics.Canvas;
8 import android.graphics.Color;
9 import android.graphics.Paint;
10 import android.graphics.RectF;
11 import android.os.Handler;
12 import android.view.MotionEvent;
13 import android.view.View;
14
15 public class Up1 extends View {
16     Paint paint = new Paint();
17
18     private int ix_down_now=-1;
19     private int iy_down_now=-1;
20     private int ix_down, iy_down,ix_up,iy_up;
21
22     private Handler h;
23     private int FRAME_RATE = 160;
24
25     int i,j;
26     int x00,x0,x1,x2,x3,x4,x5,y0,y1,y2,y3,y4,y5,y6,y7,lp,rad;
27     int idx,idxx,idy,idyy;
28     int ix0,iy0,ix1,iy1,ix2,iy2;
29
30     double pi_=4.*Math.atan(1);
31     private int ichange=0;
32     private int iall=-1;
33     private int ispeed=3;
34
35     int irun=0;
```

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```
36     int nw=7201;
37     double [] xun = new double[7201];
38     double [] xob = new double[7201];
39     double [] fbod = new double[7201];
40     double [] xkurb = new double[7201];
41     double [] xxkurb = new double[7201];
42     double m1=16;
43     double m2=32;
44     double c1=500000;
45     double c2=50000;
46     double ee=0.03;
47     double g=9.81;
48     double b1=2*0.40*Math.sqrt(c1*m1);
49     double b2=2*0.15*Math.sqrt(c2*m2);
50     double fre=11;
51     double om,dt,fak,fpleu, xp_un,xp_ob;
52     double scale0=3;
53     double scale;
54     int iyun,iyob;
55     int del_i=10;
56     int ii=7200-720-del_i;
57
58     public Up1(Context c) {
59         super(c);
60         setFocusable(true);
61         h = new Handler();
62     }
63
64     private Runnable r = new Runnable(){
65         @Override
66         public void run(){
67             invalidate();
68         }
69     };
70
```

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```
71     @Override
72     protected void onDraw(Canvas canvas) {
73         super.onDraw(canvas);
74
75         // Startposition getWidth() funktioniert nicht in onCreate() oder
76         // onStart()
77         if (ix_down_now == -1 && iy_down_now == -1) {
78             ix_down_now = getWidth() / 2;ix_down=ix_down_now ;ix_up=ix_down;
79             iy_down_now = getHeight() / 2;iy_down=iy_down_now ;iy_up=iy_down;
80         }
81
82         // eingefügt 10.09.2016 Hintergrundfarbe
83         paint.setColor(Color.rgb(255,240,40)); // bomag gelb
84         canvas.drawRect(0,0,getWidth(),getHeight(),paint);
85         //canvas.drawColor(Color.rgb(255,240,40)); // bomag gelb
86
87         // Alle Infos zeigen ?
88         if((ix_down<(int)(0.15*getWidth()))&&(ix_up>(int)(0.85*getWidth()))&&(iy_down>(int)(0.85*getHeight
89         ()))&&(iy_up<(int)(0.15*getHeight()))iall=1;
90         if((ix_down<(int)(0.15*getWidth()))&&(ix_up>(int)(0.85*getWidth()))&&(iy_down<(int)(0.15*getHeight
91         ()))&&(iy_up>(int)(0.85*getHeight()))iall=0;
92
93         // Rahmen zeichnen
94         //iall=1;
95         if(iall==1){
96             paint.setColor(Color.LTGRAY);
97             paint.setStrokeWidth(1);
98             canvas.drawLine(1,1,1,canvas.getHeight()-1, paint);
99             canvas.drawLine(1,canvas.getHeight()-1,canvas.getWidth()-1,canvas.getHeight()-1, paint);
100            canvas.drawLine(canvas.getWidth()-1,canvas.getHeight()-1,canvas.getWidth()-1,1, paint);
101            canvas.drawLine(canvas.getWidth()-1,1,1,1, paint);
102            canvas.drawLine(10,10,10,canvas.getHeight()-10, paint);
103            canvas.drawLine(10,canvas.getHeight()-10,canvas.getWidth()-10,canvas.getHeight()-10, paint);
104            canvas.drawLine(canvas.getWidth()-10,canvas.getHeight()-10,canvas.getWidth()-10,10, paint);
105            canvas.drawLine(canvas.getWidth()-10,10,10,10, paint);
```

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```
104     }
105
106     // Verstellung Fahrgeschwindigkeit
107     /*
108     if(ichange==1){
109         al0=al0+15;
110         if(al0>90)al0=90;
111         ichange=0;
112     }
113     if(ichange==-1){
114         al0=al0-15;
115         if(al0<-90)al0=-90;
116         ichange=0;
117     }
118     */
119     // Verstellung ispeed
120     if(ichange==-2){
121         if(ispeed>1)ispeed--;
122         ichange=0;
123     }
124     if(ichange==2){
125         if(ispeed<5)ispeed++;
126         ichange=0;
127     }
128
129     if(ispeed==1){FRAME_RATE=200;del_i=10;}
130     if(ispeed==2){FRAME_RATE=100;del_i=10;}
131     if(ispeed==3){FRAME_RATE=50;del_i=10;}
132     if(ispeed==4){FRAME_RATE=50;del_i=20;}
133     if(ispeed==5){FRAME_RATE=50;del_i=40;}
134
135     String str0;
136     if(iall==-1){
137         paint.setColor(Color.BLACK);
138         //paint.setTextSize(16);
```

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```
139         paint.setTextSize((int)(18.*getWidth()/480));
140         str0 = "Explanation / Erläuterung:";
141         canvas.drawText(str0,(int)(10.*getWidth()/480),(int)(20.*getHeight()/800),paint);
142         //str0 = "Wischen horizontal: Änderung der Fahrgeschwindigkeit";
143         //canvas.drawText(str0,50,40,paint);
144         str0 = "Wiping vertical: Animation faster/slower";
145         canvas.drawText(str0,(int)(20.*getWidth()/480),(int)(42.*getHeight()/800),paint);
146         str0 = "Wischen vertikal: Animation schneller/langsamer";
147         canvas.drawText(str0,(int)(20.*getWidth()/480),(int)(62.*getHeight()/800),paint);
148
149         paint.setTextSize((int)(15.*canvas.getWidth()/480));
150         str0 = "Explanations are deleted after first wiping action";
151         canvas.drawText(str0,(int)(30.*canvas.getWidth()/480),(int)(80.*canvas.getHeight()/800),paint);
152         str0 = "Erläuterungen werden gelöscht nach erster Wischaktion";
153         canvas.drawText(str0,(int)(30.*canvas.getWidth()/480),(int)(97.*canvas.getHeight()/800),paint);
154     }
155
156     //iall=1; // eingefügt
157     if(iall==1){
158         paint.setColor(Color.BLUE);
159         paint.setTextSize((int)(20.*getWidth()/480));
160         str0 = "ix_down,iy_down:"; canvas.drawText(str0,30,30,paint);
161         canvas.drawText(String.valueOf(ix_down),200,30,paint);
162         canvas.drawText(String.valueOf(iy_down),270,30,paint);
163
164         str0 = "ix_up,iy_up:"; canvas.drawText(str0,30,50,paint);
165         canvas.drawText(String.valueOf(ix_up),200,50,paint);
166         canvas.drawText(String.valueOf(iy_up),270,50,paint);
167
168         str0 = "canvas b h:"; canvas.drawText(str0,30,70,paint);
169         canvas.drawText(String.valueOf(canvas.getWidth()),200,70,paint);
170         canvas.drawText(String.valueOf(canvas.getHeight()),270,70,paint);
171
172         str0 = "b h:"; canvas.drawText(str0,30,90,paint);
173         canvas.drawText(String.valueOf(getWidth()),200,90,paint);
```

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```
174         canvas.drawText(String.valueOf(getHeight()),270,90,paint);
175
176         str0 = "ii ispeed:";canvas.drawText(str0,30,110,paint);
177         canvas.drawText(String.valueOf(ii),200,110,paint);
178         canvas.drawText(String.valueOf(ispeed),270,110,paint);
179     }
180
181     if(irun==0){
182         dt=1./(720.*fre);
183         om=2.*pi_.*fre;
184         xun[0]=0.;xun[1]=0.;
185         xob[0]=0.;xob[1]=0.;
186         for(i=0;i<nw;i++){
187             xkurb[i]=ee*Math.sin(om*i*dt);
188             xxkurb[i]=ee*Math.cos(om*i*dt);
189         }
190         for(i=1;i<(nw-1);i++){
191             fpleu=c2*(xun[i]-xob[i]-xkurb[i])+m2*g;
192             xp_un=(xun[i]-xun[i-1])/dt;
193             xp_ob=(xob[i]-xob[i-1])/dt;
194             fbod[i]=-c1*xun[i]-b1*xp_un+(m1+m2)*g;
195             if(fbod[i]<0)fbod[i]=0;
196             fak=fbod[i]-m1*g-fpleu-b2*(xp_un-xp_ob);
197             xun[i+1]=2*xun[i]-xun[i-1]+fak*dt*dt/m1;
198             fak=fpleu-m2*g-b2*(xp_ob-xp_un);
199             xob[i+1]=2*xob[i]-xob[i-1]+fak*dt*dt/m2;
200         }
201
202
203         /*
204         paint.setColor(Color.BLACK);
205         paint.setStrokeWidth(1);
206         for(i=0;i<(nw-1);i++){
207             x1=(int)(i*400/nw);
208             x2=(int)((i+1)*400/nw);
```

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```
209         y1=300-(int)(1000*xun[i]);
210         y2=300-(int)(1000*xun[i+1]);
211         canvas.drawLine(x1,y1,x2,y2, paint);
212     }
213     paint.setColor(Color.BLUE);
214     for(i=0;i<(nw-1);i++){
215         x1=(int)(i*400/nw);
216         x2=(int)((i+1)*400/nw);
217         y1=300-(int)(1000*xob[i]);
218         y2=300-(int)(1000*xob[i+1]);
219         canvas.drawLine(x1,y1,x2,y2, paint);
220     }
221     paint.setColor(Color.GREEN);
222     for(i=0;i<(nw-1);i++){
223         x1=(int)(i*400/nw);
224         x2=(int)((i+1)*400/nw);
225         y1=300-(int)(fbod[i]/100);
226         y2=300-(int)(fbod[i+1]/100);
227         canvas.drawLine(x1,y1,x2,y2, paint);
228     }
229     */
230     irun++;
231 }
232
233 /*
234 paint.setColor(Color.BLACK);
235 paint.setStrokeWidth(1);
236
237 for(i=0;i<720;i++){
238     x1=(int)(i*400/720);
239     x2=(int)((i+1)*400/720);
240     y1=500-(int)(2000*xun[i+6480]);
241     y2=500-(int)(2000*xun[i+1+6480]);
242     canvas.drawLine(x1,y1,x2,y2, paint);
243 }
```

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```
244     paint.setColor(Color.BLUE);
245     for(i=0;i<720;i++){
246         x1=(int)(i*400/720);
247         x2=(int)((i+1)*400/720);
248         y1=500-(int)(2000*xob[i+6480]);
249         y2=500-(int)(2000*xob[i+1+6480]);
250         canvas.drawLine(x1,y1,x2,y2, paint);
251     }
252     */
253
254     ii=ii+del_i;
255     if(ii>7200)ii=ii-720;
256     //iy0=(int)(0.82*getHeight());
257     iy0=(int)(0.85*getHeight());
258     y1=(int)(0.06*getHeight());
259     y2=(int)(0.02*getHeight());
260     y3=(int)(0.43*getHeight());
261     y4=(int)(0.11*getHeight());
262     y5=(int)(0.12*getHeight());
263     y6=(int)(0.08*getHeight());
264     y7=(int)(0.02*getHeight());
265     lp=(int)(0.20*getHeight());
266     ix0=(int)(0.50*getWidth());
267     x1=(int)(0.25*getWidth());
268     x2=(int)(0.30*getWidth());
269     x3=(int)(0.08*getWidth());
270     x4=(int)(0.18*getWidth());
271     x5=(int)(0.05*getWidth());
272     scale=scale0*getHeight();
273
274     // Fu
275     paint.setColor(Color.BLACK);
276     paint.setStrokeWidth((int)(5.*canvas.getWidth()/480));
277     ix1=ix0-x1;iy1=iy0-y7-(int)(xun[ii]*scale);ix2=ix1+x5;iy2=iy1+y7;
278     canvas.drawLine(ix1,iy1,ix2,iy2,paint);
```

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```
279     ix1=ix2;iy1=iy2;ix2=ix0+x1-x5;iy2=iy1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
280     ix1=ix2;iy1=iy2;ix2=ix1+x5;iy2=iy1-y7;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
281     //ix1=ix0-x1;iy1=iy0-(int)(xun[ii]*scale);ix2=ix0+x1;iy2=iy1;
282     //canvas.drawLine(ix1,iy1,ix2,iy2,paint);
283     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1+y7-y1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
284     ix1=ix2;iy1=iy2;ix2=ix1-2*x1;iy2=iy1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);// horizontal
285     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1+y1-y7;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
286     // Linie vom Fuß nach oben gehend
287     ix1=ix0;iy1=iy0-y1-(int)(xun[ii]*scale);
288     ix2=ix0;iy2=iy0-y1-y2-(int)(xun[ii]*scale);canvas.drawLine(ix1,iy1,ix2,iy2,paint);
289     iyun=iy2;
290
291     // Oberbau
292     ix1=ix0-x2;iy1=iy0-y1-y3-(int)(xob[ii]*scale);ix2=ix0-x4;iy2=iy1;
293     canvas.drawLine(ix1,iy1,ix2,iy2,paint);
294     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1-y6;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
295     ix1=ix2;iy1=iy2;ix2=ix0+x4;iy2=iy1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
296     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1+y6;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
297     ix1=ix2;iy1=iy2;ix2=ix0+x2;iy2=iy1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
298     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1-y5;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
299     ix1=ix2;iy1=iy2;ix2=ix1-2*x2;iy2=iy1;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
300     ix1=ix2;iy1=iy2;ix2=ix1;iy2=iy1+y5;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
301     // Linie vom Oberbau nach unten gehend
302     ix1=ix0;iy1=iy0-y1-y3-y6-(int)(xob[ii]*scale);
303     ix2=ix1;iy2=iy1+y4;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
304     // Kurbel
305     ix1=ix2;iy1=iy2;ix2=ix1+(int)(xxkurb[ii]*scale);iy2=iy1-(int)(xkurb[ii]*scale);
306     canvas.drawLine(ix1,iy1,ix2,iy2,paint);
307     // Pleuel (langes Pleuel ee<<lp)
308     ix1=ix2;iy1=iy2;ix2=ix0;iy2=iy1+lp;canvas.drawLine(ix1,iy1,ix2,iy2,paint);
309     iyob=iy2;
310     // Feder, von oben nach unten
311     ix1=ix0;iy1=iyob;ix2=ix0+x3;iy2=(int)(0.875*iyob+0.125*iyun);canvas.drawLine(ix1,iy1,ix2,iy2,paint);
312     ix1=ix2;iy1=iy2;ix2=ix0-x3;iy2=(int)(0.625*iyob+0.375*iyun);canvas.drawLine(ix1,iy1,ix2,iy2,paint);
313     ix1=ix2;iy1=iy2;ix2=ix0+x3;iy2=(int)(0.375*iyob+0.625*iyun);canvas.drawLine(ix1,iy1,ix2,iy2,paint);
```

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```
314     ix1=ix2;iy1=iy2;ix2=ix0-x3;iy2=(int)(0.125*iyob+0.875*iyun);canvas.drawLine(ix1,iy1,ix2,iy2, paint);
315     ix1=ix2;iy1=iy2;ix2=ix0;iy2=iyun;canvas.drawLine(ix1,iy1,ix2,iy2, paint);
316     // Bodenkraft
317     paint.setColor(Color.GREEN);
318     fak=fbod[ii]/((m1+m2)*g)*scale0*0.005*getHeight();
319     ix1=ix0;iy1=iy0-(int)(xun[ii]*scale);ix2=ix1;iy2=iy1+(int)(fak);
320     //canvas.drawLine(ix1-150,iy1,ix2-150,iy2, paint);
321
322     //canvas.drawRect(ix1-40,iy1,ix2-15,iy2, paint);
323     RectF ovalr=new RectF(ix1-x1+x5,iy1+3-(int)(fak),ix1+x1-x5,iy1+3+(int)(fak));
324     canvas.drawArc(ovalr,0,180, true, paint);
325
326     //paint.setColor(Color.BLACK);
327     //paint.setTextSize(40);
328     //canvas.drawText("xx"+String.valueOf(ispeed),270,110,paint);
329
330     h.postDelayed(r, FRAME_RATE);
331 }
332
333 @Override
334 public boolean onTouchEvent(MotionEvent event) {
335     int aktion = event.getAction();
336
337     if(aktion == MotionEvent.ACTION_DOWN) {
338         ix_down_now = (int) event.getX();
339         iy_down_now = (int) event.getY();
340     }
341
342     if(aktion == MotionEvent.ACTION_UP) {
343         ix_up = (int) event.getX();
344         iy_up = (int) event.getY();
345         ix_down=ix_down_now;
346         iy_down=iy_down_now;
347         if(((ix_up-ix_down)>0)&&((ix_up-ix_down)>5*Math.abs(iy_up-iy_down)))ichange=1;
348         if(((ix_up-ix_down)<0)&&(-(ix_up-ix_down)>5*Math.abs(iy_up-iy_down)))ichange=-1;
```

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```
349         if(((iy_up-iy_down)>0)&&((iy_up-iy_down)>5*Math.abs(ix_up-ix_down)))ichange=-2;
350         if(((iy_up-iy_down)<0)&&(-(iy_up-iy_down)>5*Math.abs(ix_up-ix_down)))ichange=2;
351         if(iall==-1)iall=0;
352     }
353
354     invalidate();
355
356     return true; // super.onTouchEvent(event);
357 }
358 }
359
```