android开发之做一个竖着的seekbar

标签： Android

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工作繁忙，总想有机会停下来喘口气，整理一下思路，做一些积累，但是这样的机会很少。要做android的界面，基础的要求是熟悉那些内置的组件（prebuilt componments），而有时候这些组件是不够用的，这时候我们就需要自己写一个新的，或者修改内置的。这就要求我们了解更多知识，比如各个View是怎么画出来的，UI上各种事件是如何分发和处理的等等。这些我都计划写出来和大家分享，网络上中文资料，说得清楚的太少了，就那么几篇被广泛的转载。今天说一说如何做一个vertical seekbar，竖起来的seekbar。实现它的过程中就会涉及一些View是如何被画出来的知识。通过本文你可以实现一个verticalseekbar，你也可以学到一些使用seekbar的知识。

我的一个同事很牛，需要自定义的组件时，从framework中抠出来相关（功能相似、在继承关系的hierarchy中地位相当）的代码（类），在自己的应用程序中做修改，实现自己想要的功能。需要的style、drawable等资源，有些是在应用程序里用不了的，就也自己做一份。我们公司做整个系统，从硬件到android到android上的应用系统， framework我们也修改，主要是功能上的增减。在framework里增加一个verticalseekbar我们也能做到，但是这样兼容性就被破坏了，所以这位仁兄把需要的拿出来在自己的程序中实现。

我做vertical seekbar也采取这个策略，不和大家啰嗦实现过程中太多因果逻辑，我想很多读者读这篇文章就是为了做出来一个vertical seekbar。为了方便手头没有代码和开发环境的读者，我会贴上framework中的相关代码。

vertical seekbar当然要实现seekbar一样的功能，所以首先seekbar有的vertical seekbar都要有，直接在你的工程中新建一个类vertical seekbar，从framework中把seekbar的代码复制过来，做一些必要的修改。我们来看看seekbar做了些什么.

seekbar代码：

[java] view plain copy print ?

```
/*
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 *
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 * you may not use this file except in compliance with the License.
 * You may obtain a copy of the License at
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 *      http://www.apache.org/licenses/LICENSE-2.0
 *
 * Unless required by applicable law or agreed to in writing, software
 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */
```

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```
16. package android.widget;
17. import android.content.Context;
18. import android.util.AttributeSet;
19. /**
20.  * A SeekBar is an extension of ProgressBar that adds a draggable thumb. The user can touch
21.  * the thumb and drag left or right to set the current progress level or use the arrow keys.
22.  * Placing focusable widgets to the left or right of a SeekBar is discouraged.
23.  * <p>
24.  * Clients of the SeekBar can attach a {@link SeekBar.OnSeekBarChangeListener} to
25.  * be notified of the user's actions.
26.  *
27.  * @attr ref android.R.styleable#SeekBar_thumb
28.  */
29. public class SeekBar extends AbsSeekBar {
30.     /**
31.      * A callback that notifies clients when the progress level has been
32.      * changed. This includes changes that were initiated by the user through a
33.      * touch gesture or arrow key/trackball as well as changes that were initiated
34.      * programmatically.
35.      */
36.     public interface OnSeekBarChangeListener {
37. 
38.         /**
39.          * Notification that the progress level has changed. Clients can use the fromUser parame
40.          * to distinguish user-initiated changes from those that occurred programmatically.
41.          *
42.          * @param seekBar The SeekBar whose progress has changed
43.          * @param progress The current progress level. This will be in the range 0..max where ma
44.          *        was set by {@link ProgressBar#setMax(int)}. (The default value for max is 100.
45.          * @param fromUser True if the progress change was initiated by the user.
46.          */
47.         void onProgressChanged(SeekBar seekBar, int progress, boolean fromUser);
48. 
49.         /**
50.          * Notification that the user has started a touch gesture. Clients may want to use this
51.          * to disable advancing the seekbar.
52.          * @param seekBar The SeekBar in which the touch gesture began
53.          */
54.         void onStartTrackingTouch(SeekBar seekBar);
55. 
56.         /**
57.          * Notification that the user has finished a touch gesture. Clients may want to use this
58.          * to re-enable advancing the seekbar.
59.          * @param seekBar The SeekBar in which the touch gesture began
60.          */
61.         void onStopTrackingTouch(SeekBar seekBar);
62.     }
63.     private OnSeekBarChangeListener mOnSeekBarChangeListener;
64. 
65.     public SeekBar(Context context) {
66.         this(context, null);
67.     }
68. 
69.     public SeekBar(Context context, AttributeSet attrs) {
70.         this(context, attrs, com.android.internal.R.attr.seekBarStyle);
71.     }
```

```
72.     public SeekBar(Context context, AttributeSet attrs, int defStyle) {
73.         super(context, attrs, defStyle);
74.     }
75.     @Override
76.     void onProgressRefresh(float scale, boolean fromUser) {
77.         super.onProgressRefresh(scale, fromUser);
78.         if (mOnSeekBarChangeListener != null) {
79.             mOnSeekBarChangeListener.onProgressChanged(this, getProgress(), fromUser);
80.         }
81.     }
82.     /**
83.      * Sets a listener to receive notifications of changes to the SeekBar's progress level. Also
84.      * provides notifications of when the user starts and stops a touch gesture within the SeekBa
85.      *
86.      * @param l The seek bar notification listener
87.      *
88.      * @see SeekBar.OnSeekBarChangeListener
89.      */
90.     public void setOnSeekBarChangeListener(OnSeekBarChangeListener l) {
91.         mOnSeekBarChangeListener = l;
92.     }
93.
94.     @Override
95.     void onStartTrackingTouch() {
96.         if (mOnSeekBarChangeListener != null) {
97.             mOnSeekBarChangeListener.onStartTrackingTouch(this);
98.         }
99.     }
100.
101.    @Override
102.    void onStopTrackingTouch() {
103.        if (mOnSeekBarChangeListener != null) {
104.            mOnSeekBarChangeListener.onStopTrackingTouch(this);
105.        }
106.    }
107.
108. }
```

它定义了一个接口OnSeekBarChangeListener，接口中定义了三个方法：

void onProgressChanged(SeekBar seekBar, int progress, boolean fromUser);

void onStartTrackingTouch(SeekBar seekBar);

void onStopTrackingTouch(SeekBar seekBar);

看名字也知道它们是做什么的，代码也给了注释。那么它们是怎么做到的呢？seekbar中声明了一个该接口的对象mOnSeekBarChangeListener，方法setOnSeekBarChangeListener()将给它赋值。在你的程序中定义一个对象，实现OnSeekBarChangeListener，并调用setOnSeekBarChangeListener()把这个对象传给mOnSeekBarChangeListener。在seekbar中还有几个override的方法：

void onProgressRefresh(float scale, boolean fromUser)

void onStartTrackingTouch()

void onStopTrackingTouch()

这些方法会在发生了相应事件的时候被调用，而它们又相应地去调用mOnSeekBarChangeListener中的方法，于是你的程序的定义的响应各种事件的方法就被执行了。

但是这些还不够，我们要让seekbar竖起来，要让thumb上下滑动，实现这些特性的代码在什么地方呢？我们顺着seekbar的继承关系向上找。来看看absseekbar。

absseekbar的代码：

[java] view plain copy print ?

```
/*
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 *
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 * you may not use this file except in compliance with the License.
 * You may obtain a copy of the License at
 *
 *      http://www.apache.org/licenses/LICENSE-2.0
 *
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 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */
package android.widget;
import android.content.Context;
import android.content.res.TypedArray;
import android.graphics.Canvas;
import android.graphics.Rect;
import android.graphics.drawable.Drawable;
import android.util.AttributeSet;
import android.view.KeyEvent;
import android.view.MotionEvent;
public abstract class AbsSeekBar extends ProgressBar {
    private Drawable mThumb;
    private int mThumbOffset;

    /**
     * On touch, this offset plus the scaled value from the position of the
     * touch will form the progress value. Usually 0.
     */
    float mTouchProgressOffset;
    /**
     * Whether this is user seekable.
     */
    boolean mIsUserSeekable = true;
    /**
     * On key presses (right or left), the amount to increment/decrement the
```

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```
     * progress.
     */
    private int mKeyProgressIncrement = 1;

    private static final int NO_ALPHA = 0xFF;
    private float mDisabledAlpha;

    public AbsSeekBar(Context context) {
        super(context);
    }
    public AbsSeekBar(Context context, AttributeSet attrs) {
        super(context, attrs);
    }
    public AbsSeekBar(Context context, AttributeSet attrs, int defStyle) {
        super(context, attrs, defStyle);
        TypedArray a = context.obtainStyledAttributes(attrs,
                com.android.internal.R.styleable.SeekBar, defStyle, 0);
        Drawable thumb = a.getDrawable(com.android.internal.R.styleable.SeekBar_thumb);
        setThumb(thumb);
        int thumbOffset =
                a.getDimensionPixelOffset(com.android.internal.R.styleable.SeekBar_thumbOffset, (
        setThumbOffset(thumbOffset);
        a.recycle();
        a = context.obtainStyledAttributes(attrs,
                com.android.internal.R.styleable.Theme, 0, 0);
        mDisabledAlpha = a.getFloat(com.android.internal.R.styleable.Theme_disabledAlpha, 0.5f);
        a.recycle();
    }
    /**
     * Sets the thumb that will be drawn at the end of the progress meter within the SeekBar
     *
     * @param thumb Drawable representing the thumb
     */
    public void setThumb(Drawable thumb) {
        if (thumb != null) {
            thumb.setCallback(this);
        }
        mThumb = thumb;
        invalidate();
    }
    /**
     * @see #setThumbOffset(int)
     */
    public int getThumbOffset() {
        return mThumbOffset;
    }
    /**
     * Sets the thumb offset that allows the thumb to extend out of the range of
     * the track.
     *
     * @param thumbOffset The offset amount in pixels.
     */
    public void setThumbOffset(int thumbOffset) {
        mThumbOffset = thumbOffset;
        invalidate();
    }
```

```
    /**
     * Sets the amount of progress changed via the arrow keys.
     *
     * @param increment The amount to increment or decrement when the user
     *            presses the arrow keys.
     */
    public void setKeyProgressIncrement(int increment) {
        mKeyProgressIncrement = increment < 0 ? -increment : increment;
    }
    /**
     * Returns the amount of progress changed via the arrow keys.
     * <p>
     * By default, this will be a value that is derived from the max progress.
     *
     * @return The amount to increment or decrement when the user presses the
     *         arrow keys. This will be positive.
     */
    public int getKeyProgressIncrement() {
        return mKeyProgressIncrement;
    }

    @Override
    public synchronized void setMax(int max) {
        super.setMax(max);
        if ((mKeyProgressIncrement == 0) || (getMax() / mKeyProgressIncrement > 20)) {
            // It will take the user too long to change this via keys, change it
            // to something more reasonable
            setKeyProgressIncrement(Math.max(1, Math.round((float) getMax() / 20)));
        }
    }
    @Override
    protected boolean verifyDrawable(Drawable who) {
        return who == mThumb || super.verifyDrawable(who);
    }
    @Override
    protected void drawableStateChanged() {
        super.drawableStateChanged();

        Drawable progressDrawable = getProgressDrawable();
        if (progressDrawable != null) {
            progressDrawable.setAlpha(isEnabled() ? NO_ALPHA : (int) (NO_ALPHA * mDisabledAlpha)
        }

        if (mThumb != null && mThumb.isStateful()) {
            int[] state = getDrawableState();
            mThumb.setState(state);
        }
    }

    @Override
    void onProgressRefresh(float scale, boolean fromUser) {
        Drawable thumb = mThumb;
        if (thumb != null) {
            setThumbPos(getWidth(), thumb, scale, Integer.MIN_VALUE);
            /*
             * Since we draw translated, the drawable's bounds that it signals
```

```
152.              * for invalidation won't be the actual bounds we want invalidated,
153.              * so just invalidate this whole view.
154.              */
155.             invalidate();
156.         }
157.     }
158.
159.
160.     @Override
161.     protected void onSizeChanged(int w, int h, int oldw, int oldh) {
162.         Drawable d = getCurrentDrawable();
163.         Drawable thumb = mThumb;
164.         int thumbHeight = thumb == null ? 0 : thumb.getIntrinsicHeight();
165.         // The max height does not incorporate padding, whereas the height
166.         // parameter does
167.         int trackHeight = Math.min(mMaxHeight, h - mPaddingTop - mPaddingBottom);
168.
169.         int max = getMax();
170.         float scale = max > 0 ? (float) getProgress() / (float) max : 0;
171.
172.         if (thumbHeight > trackHeight) {
173.             if (thumb != null) {
174.                 setThumbPos(w, thumb, scale, 0);
175.             }
176.             int gapForCenteringTrack = (thumbHeight - trackHeight) / 2;
177.             if (d != null) {
178.                 // Canvas will be translated by the padding, so 0,0 is where we start drawing
179.                 d.setBounds(0, gapForCenteringTrack,
180.                         w - mPaddingRight - mPaddingLeft, h - mPaddingBottom - gapForCenteringTra
181.                         - mPaddingTop);
182.             }
183.         } else {
184.             if (d != null) {
185.                 // Canvas will be translated by the padding, so 0,0 is where we start drawing
186.                 d.setBounds(0, 0, w - mPaddingRight - mPaddingLeft, h - mPaddingBottom
187.                         - mPaddingTop);
188.             }
189.             int gap = (trackHeight - thumbHeight) / 2;
190.             if (thumb != null) {
191.                 setThumbPos(w, thumb, scale, gap);
192.             }
193.         }
194.     }
195.     /**
196.      * @param gap If set to {@link Integer#MIN_VALUE}, this will be ignored and
197.      */
198.     private void setThumbPos(int w, Drawable thumb, float scale, int gap) {
199.         int available = w - mPaddingLeft - mPaddingRight;
200.         int thumbWidth = thumb.getIntrinsicWidth();
201.         int thumbHeight = thumb.getIntrinsicHeight();
202.         available -= thumbWidth;
203.         // The extra space for the thumb to move on the track
204.         available += mThumbOffset * 2;
205.         int thumbPos = (int) (scale * available);
206.         int topBound, bottomBound;
207.         if (gap == Integer.MIN_VALUE) {
```

```
208.             Rect oldBounds = thumb.getBounds();
209.             topBound = oldBounds.top;
210.             bottomBound = oldBounds.bottom;
211.         } else {
212.             topBound = gap;
213.             bottomBound = gap + thumbHeight;
214.         }
215. 
216.         // Canvas will be translated, so 0,0 is where we start drawing
217.         thumb.setBounds(thumbPos, topBound, thumbPos + thumbWidth, bottomBound);
218.     }
219. 
220.     @Override
221.     protected synchronized void onDraw(Canvas canvas) {
222.         super.onDraw(canvas);
223.         if (mThumb != null) {
224.             canvas.save();
225.             // Translate the padding. For the x, we need to allow the thumb to
226.             // draw in its extra space
227.             canvas.translate(mPaddingLeft - mThumbOffset, mPaddingTop);
228.             mThumb.draw(canvas);
229.             canvas.restore();
230.         }
231.     }
232.     @Override
233.     protected synchronized void onMeasure(int widthMeasureSpec, int heightMeasureSpec) {
234.         Drawable d = getCurrentDrawable();
235.         int thumbHeight = mThumb == null ? 0 : mThumb.getIntrinsicHeight();
236.         int dw = 0;
237.         int dh = 0;
238.         if (d != null) {
239.             dw = Math.max(mMinWidth, Math.min(mMaxWidth, d.getIntrinsicWidth()));
240.             dh = Math.max(mMinHeight, Math.min(mMaxHeight, d.getIntrinsicHeight()));
241.             dh = Math.max(thumbHeight, dh);
242.         }
243.         dw += mPaddingLeft + mPaddingRight;
244.         dh += mPaddingTop + mPaddingBottom;
245. 
246.         setMeasuredDimension(resolveSize(dw, widthMeasureSpec),
247.                 resolveSize(dh, heightMeasureSpec));
248.     }
249. 
250.     @Override
251.     public boolean onTouchEvent(MotionEvent event) {
252.         if (!mIsUserSeekable || !isEnabled()) {
253.             return false;
254.         }
255. 
256.         switch (event.getAction()) {
257.             case MotionEvent.ACTION_DOWN:
258.                 setPressed(true);
259.                 onStartTrackingTouch();
260.                 trackTouchEvent(event);
261.                 break;
262. 
263.             case MotionEvent.ACTION_MOVE:
```

```
                trackTouchEvent(event);
                attemptClaimDrag();
                break;

            case MotionEvent.ACTION_UP:
                trackTouchEvent(event);
                onStopTrackingTouch();
                setPressed(false);
                break;

            case MotionEvent.ACTION_CANCEL:
                onStopTrackingTouch();
                setPressed(false);
                break;
        }
        return true;
    }
    private void trackTouchEvent(MotionEvent event) {
        final int width = getWidth();
        final int available = width - mPaddingLeft - mPaddingRight;
        int x = (int)event.getX();
        float scale;
        float progress = 0;
        if (x < mPaddingLeft) {
            scale = 0.0f;
        } else if (x > width - mPaddingRight) {
            scale = 1.0f;
        } else {
            scale = (float)(x - mPaddingLeft) / (float)available;
            progress = mTouchProgressOffset;
        }

        final int max = getMax();
        progress += scale * max;

        setProgress((int) progress, true);
    }
    /**
     * Tries to claim the user's drag motion, and requests disallowing any
     * ancestors from stealing events in the drag.
     */
    private void attemptClaimDrag() {
        if (mParent != null) {
            mParent.requestDisallowInterceptTouchEvent(true);
        }
    }

    /**
     * This is called when the user has started touching this widget.
     */
    void onStartTrackingTouch() {
    }
    /**
     * This is called when the user either releases his touch or the touch is
     * canceled.
     */
```

```
320.     void onStopTrackingTouch() {
321.     }
322.     /**
323.      * Called when the user changes the seekbar's progress by using a key event.
324.      */
325.     void onKeyChange() {
326.     }
327.     @Override
328.     public boolean onKeyDown(int keyCode, KeyEvent event) {
329.         int progress = getProgress();
330.
331.         switch (keyCode) {
332.             case KeyEvent.KEYCODE_DPAD_LEFT:
333.                 if (progress <= 0) break;
334.                 setProgress(progress - mKeyProgressIncrement, true);
335.                 onKeyChange();
336.                 return true;
337.
338.             case KeyEvent.KEYCODE_DPAD_RIGHT:
339.                 if (progress >= getMax()) break;
340.                 setProgress(progress + mKeyProgressIncrement, true);
341.                 onKeyChange();
342.                 return true;
343.         }
344.         return super.onKeyDown(keyCode, event);
345.     }
346. }
```

连上注释372行，不多。我们看到有onTouchEvent()，trackTouchEvent()，onProgressRefresh()，setThumbPos()等一些方法，这些都是和seekbar功能相关的方法，去看看它们的注释。

onTouchEvent()是在View中就有定义的方法，（touch）事件处理我日后有空我会再发文章讨论，现在我们只要知道，在用户触摸seekbar（absseekbar）时，这个方法会响应touch事件就够了。onTouchEvent()会判断用户的动作，然后调用前述的一些方法（注意去看代码），注意它调用的顺序，判断是ACTION_DOWN时先调用onStartTrackingTouch()再调用trackTouchEvent(event)，于是在你的程序中定义的 onStartTrackingTouch()先执行了；判断是ACTION_UP时先调用trackTouchEvent(event)再调用onStopTrackingTouch()，至于为什么我就不啰嗦了，有时候这个顺序是很重要的。

trackTouchEvent()根据touch的位置来设置进度，它计算出progress后调用setProgress()，setProgress()是progressbar中实现的方法。

当seekbar的progress改变时onProgressRefresh()会被调用，它会调用setThumbPos()来设置thumb的位置。

大致过程就是这样，要更深入细致的了解还是得认真得看看代码。

现在我们知道，seekbar拥有的progressbar之外的功能，都是在absseekbar中实现的。系统默认seekbar是横着的，在absseekbar中计算progress、计算thumb的位置，用到了seekbar的宽和高，我们只要改变一下计算

方法就能计算出竖着的seekbar所需要的各个数值。例如：

```
private void trackTouchEvent(MotionEvent event) {
    final int Height = getHeight();
    Log.d("demon", "Y:"+event.getY()+" height:"+Height);
    final int available = Height - getPaddingBottom() - getPaddingTop();
    int Y = (int)event.getY();
    float scale;
    float progress = 0;
    if (Y > Height - getPaddingBottom()) {
        scale = 0.0f;
    } else if (Y  < getPaddingTop()) {
        scale = 1.0f;
    } else {
        scale = (float)(Height - getPaddingBottom()-Y) / (float)available;
    }

    final int max = getMax();
    progress = scale * max;
    setProgress((int) progress);
}
```

其他的地方你可以仿造这个写。

功能上分析告一段落，我们如何画出来一个竖着的seekbar呢？

我想了两个办法，一是自己画，也就是自己写个draw，太难，而且很难和系统风格统一。另外一个办法是让系统给我们画。verticalseekbar只是seekbar转了90度或-90度，我们可以把画布转一个角度，然后交给系统去画，具体的做法就是在ondraw()时调整画布，然后调用super.onDraw()。

这个调整也就是旋转和平移。至于旋转和平移的具体实现，我跟到native部分就没有看下去了，也没有看到具体的介绍。我的理解，你要保证画布的左上角在旋转平移以后坐标不变，否者会出现很多问题。 就我们的seekbar而言，如果你要获得一个向上增长的seekbar，那么代码应该是：

```
protected void onDraw(Canvas c)
    {
        c.rotate(-90);
        c.translate(-height,0);//height是你的verticalseekbar的高
        super.onDraw(c);
    }
```

如果是向下的seekbar则应该是：

```
protected void onDraw(Canvas c)
    {
        c.rotate(90);
        c.translate(0,-width);//width是你的verticalseekbar的宽
        super.onDraw(c);
    }
```

你也可以自己计算一下来验证。

一个View在屏幕上画出来，首先measure()会被调用，这是个final方法，measure()会调用onMeasure()。你可以重写onMeasure()，但是重写的onMeasure()中必须调用setMeasuredDimension(int,int)，setMeasuredDimension()会保存该View的长和宽。我们可以重写onMeasure()方法给我们的seekbar分配一块竖直的，长宽由我们设定的区域。在画seekbar之前，我们把这个区域旋转了90度交给系统，系统给我们画一个标准的seekbar，在整个layout中，这个seekbar就成竖直的了。

实际操作时，我们在工程中新建了类verticalSeekbar，把framework中seekbar的代码拷贝过来，做一些必须的修改(类名、构造方法什么的)。注意如果我们的verticalseekbar是在XML中定义的，在代码中使用findViewById()方法来获得，系统将使用第二个构造方法(我简单地试了一下，没有看到官方资料或权威的解释)，也就是

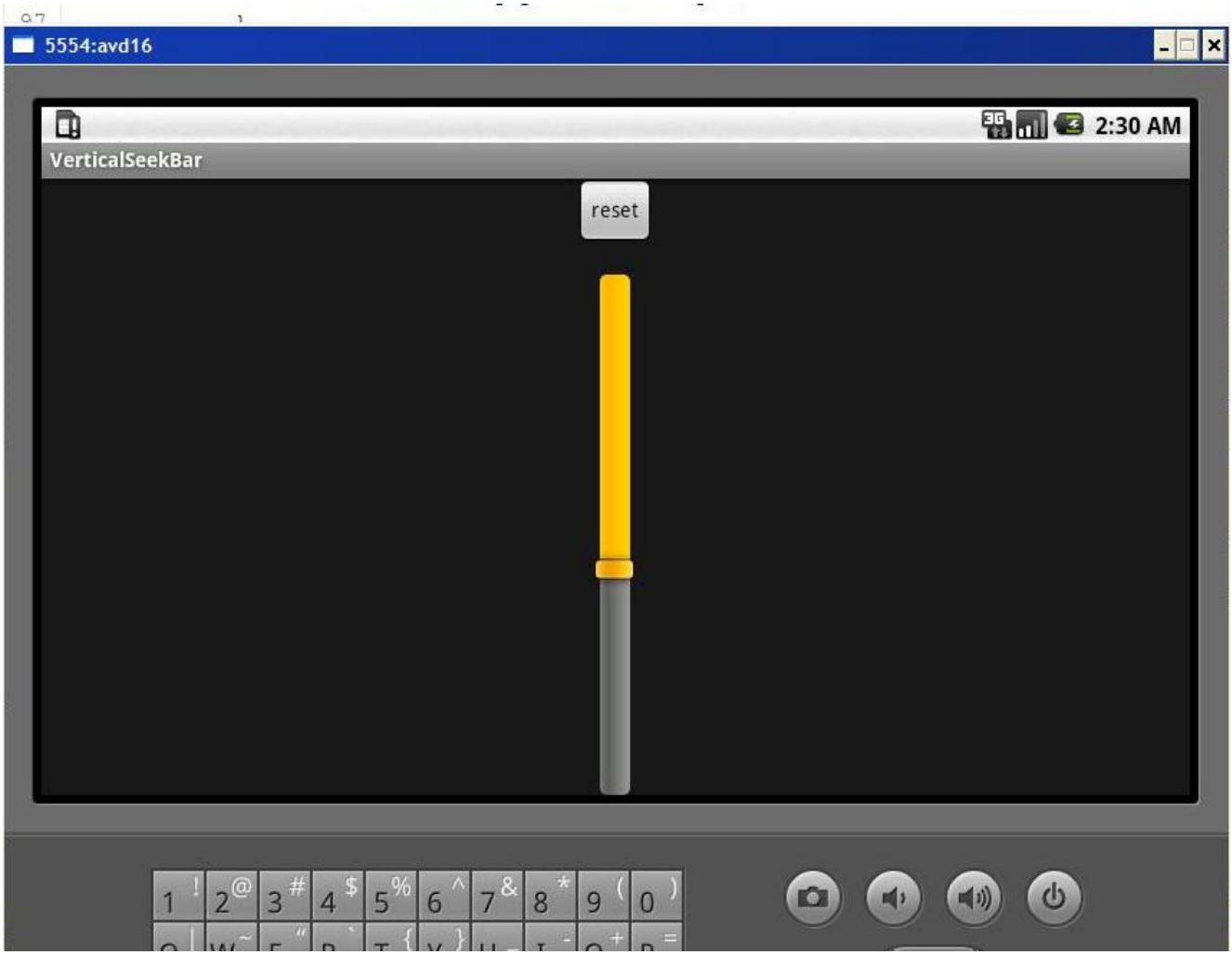
```
public SeekBar(Context context, AttributeSet attrs) {
    this(context, attrs, com.android.internal.R.attr.seekBarStyle);
}
```

com.android.internal.R.attr.seekBarStyle在我我们的应用程序中是无法使用的，你可以换成android.R.attr.seekBarStyle，你也可以自己定义一个，但是必须包含系统本身的。

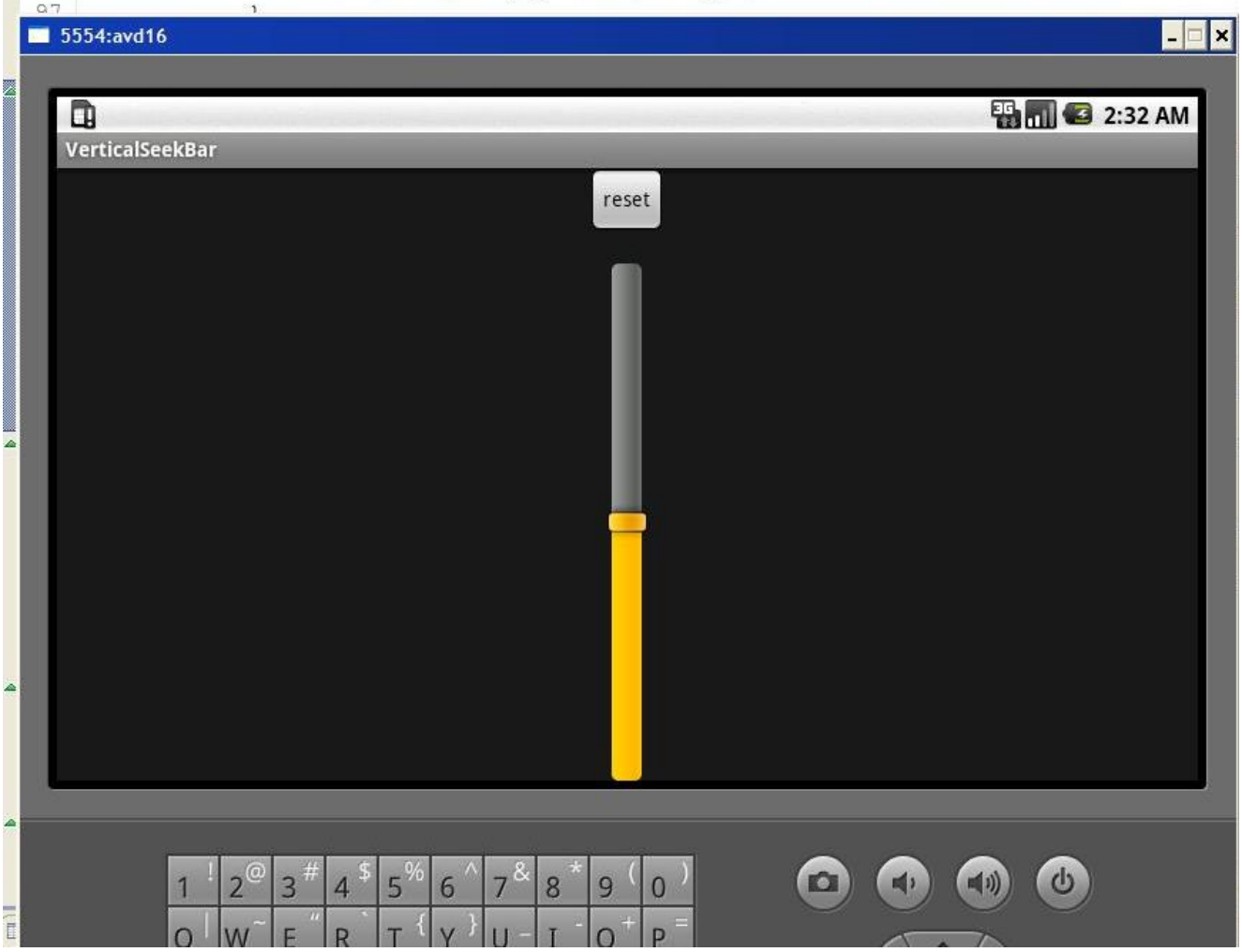
然后我们要加一些方法，也就是重写absseekbar中的一些方法，大致如下：

```
package com.styleflying.videoplayer;

/*
 * @author    demon
 */

import android.content.Context;


public class VerticalSeekBar extends AbsSeekBar {
    private Drawable mThumb;
    private int height;
    public interface OnSeekBarChangeListener {

    private OnSeekBarChangeListener mOnSeekBarChangeListener;

    public VerticalSeekBar(Context context) {

    public VerticalSeekBar(Context context, AttributeSet attrs) {

    public VerticalSeekBar(Context context, AttributeSet attrs, int defStyle) {

    public void setOnSeekBarChangeListener(OnSeekBarChangeListener l) {

    void onStartTrackingTouch() {

    void onStopTrackingTouch() {


    void onProgressRefresh(float scale, boolean fromUser) {

        private void setThumbPos(int w, Drawable thumb, float scale, int gap) {
        protected void onDraw(Canvas c)
        protected synchronized void onMeasure(int widthMeasureSpec, int heightMeasureSpec)
    public void setThumb(Drawable thumb)
    protected void onSizeChanged(int w, int h, int oldw, int oldh)
    public boolean onTouchEvent(MotionEvent event) {
    private void trackTouchEvent(MotionEvent event) {

    private void attemptClaimDrag() {
}
```

由于是给公司写的代码，不便共享，望大家见谅。贴俩实现了的图，鼓舞一下对verticalseekbar有需求的读者——做一个verticalseekbar不难。




```
96              bottomBound = gap + thumbHeight;
```



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