"Hello Viewfinder” project

- Goals of this project
  - Learn how to create a simple Android project
  - Learn how to display viewfinder frames
  - Learn how to process viewfinder frames

- Full source available on class website
“Hello Viewfinder” class hierarchy

Hello Viewfinder (Activity)

- Manage two views and manage program open and close

Preview (View)

- Handle incoming viewfinder frames and toggles processing state

Draw on Top (View)

- Process viewfinder frames and draw modified frames
public class HelloViewfinderActivity extends Activity {
    private Preview mPreview;
    private DrawOnTop mDrawOnTop;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        // Hide the window title and set full screen
        getWindow().setFlags(... Full Screen Parameters ...);
        requestWindowFeature(Window.FEATURE_NO_TITLE);

        // Create Preview and DrawOnTop
        mDrawOnTop = new DrawOnTop(this);
        mPreview = new Preview(this, mDrawOnTop);
        setContentView(mPreview);
        addContentView(mDrawOnTop, ... Layout Options ...)
    }
}
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Preview class: viewfinder frames go down two paths

myCamera.setPreviewCallback(new PreviewCallback() {
    public void onPreviewFrame(byte[] data, Camera camera) {
        ... Pass data to DrawOnTop class ...
    }
});

Data in YCbCr 4:2:0 format

\[
\begin{align*}
Y & \quad \text{w} \\
\text{Cb} & \quad \text{w}/2 \\
\text{Cr} & \quad \text{w}/2
\end{align*}
\]
Preview class: toggle states via touch screen

```java
// Define on touch listener
this.setOnTouchListener(new OnTouchListener() {
    public boolean onTouch(View v, MotionEvent event) {
        if (mDrawOnTop.mState == DrawOnTop.STATE_ORIGINAL) {
            mDrawOnTop.mState = DrawOnTop.STATE_PROCESSED;
        } else if (mDrawOnTop.mState == DrawOnTop.STATE_PROCESSED) {
            mDrawOnTop.mState = DrawOnTop.STATE_ORIGINAL;
        }
        return false;
    }
});
```

Define an anonymous touch listener object
If in original state, toggle to processed state
If in processed state, toggle to original state
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// Called whenever a repaint is requested
protected void onDraw(Canvas canvas) {
    ...
    // Convert from YCbCr to RGB
    if (mState == STATE_ORIGINAL)
        decodeYCbCr420RGB(mRGBData, mYCCData, mWidth, mHeight);
    else
        decodeYCbCr420RGBHistEq(mRGBData, mYCCData, mWidth, mHeight);
    // Draw bitmap
    mBitmap.setPixels(mRGBData, 0, mWidth, 0, 0, mWidth, mHeight);
    Rect src = new Rect(... Size parameters ...);
    Rect dst = new Rect(... Size parameters ...);
    canvas.drawBitmap(mBitmap, src, dst, mPaintBlack);
    ...
}
Running the program on an Android device
“Hello Viewfinder” application running on device