

Android™



GUI | Device

- **Herhaling**
- **GUI**
 - *View*
 - *ViewGroup*
 - *Speciale Views*
 - *Custom Views*
 - *Gestures*
 - *Threads*
- **Device eigenschappen**
 - *Geheugen*
 - *Managers*

Herhaling

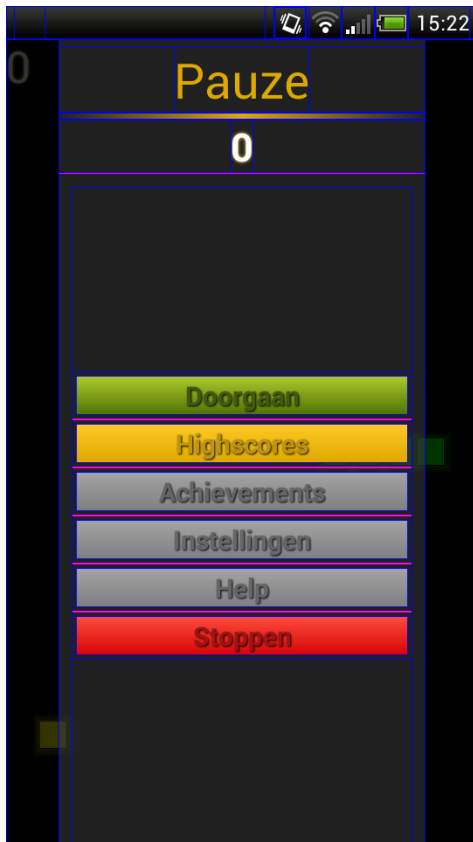
- Activities
- Context
- XML/JAVA

Android

VIEW | VIEWGROUP | SPECIAL | CUSTOM | THREADS | GESTURES

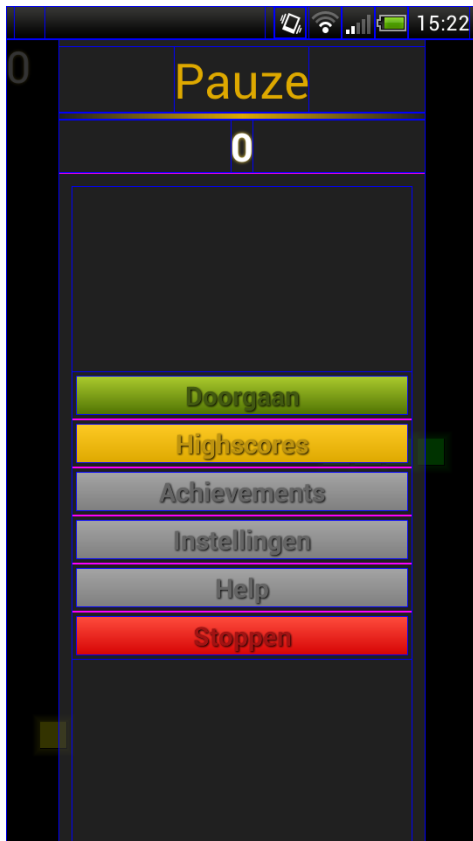
GUI

View



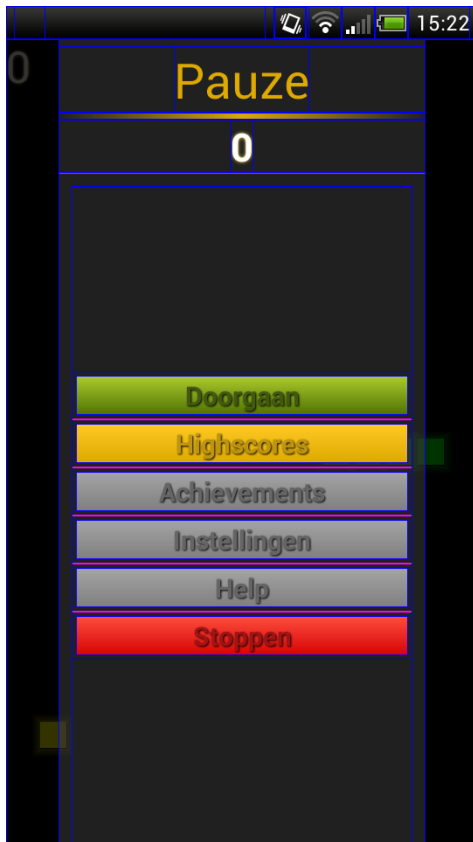
- Scherm element
- Verschillende versies
 - TextView
 - ImageView
 - EditText
 - ...
- *JPanel*

View



- Aantal verplichte eigenschappen
 - *Width*
 - *Height*

ViewGroup



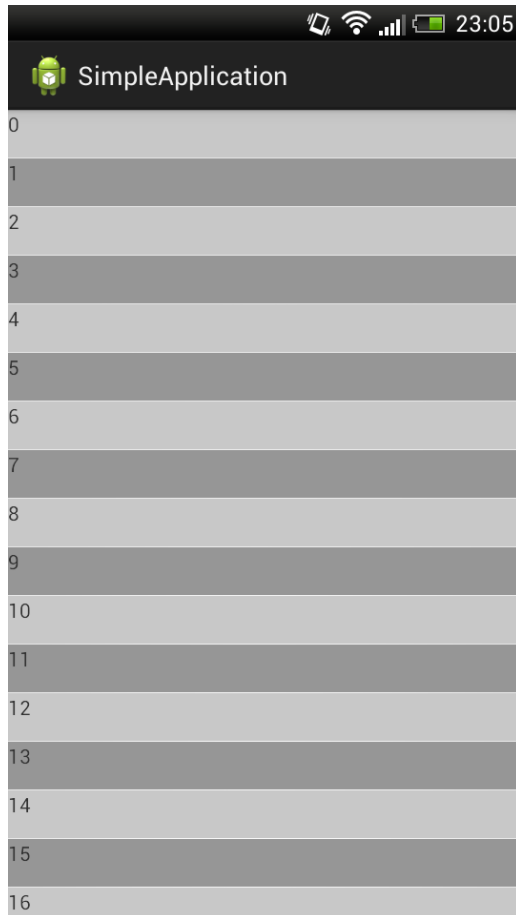
- Extensie van View
- Meerdere Views
- Voorbeelden
 - LinearLayout
 - RelativeLayout
 - GridLayout
 - ...
- *Jpanel + LayoutManager*
 - *Maar dan makkelijker*

Speciale Views

ScrollView

- Scroll verticaal
 - *Horizontaal:*
HorizontalScrollView
- Bevat één View/ViewGroup
 - Uitbreiden door ViewGroup met children
- Is geen lijst!
 - inefficiënt

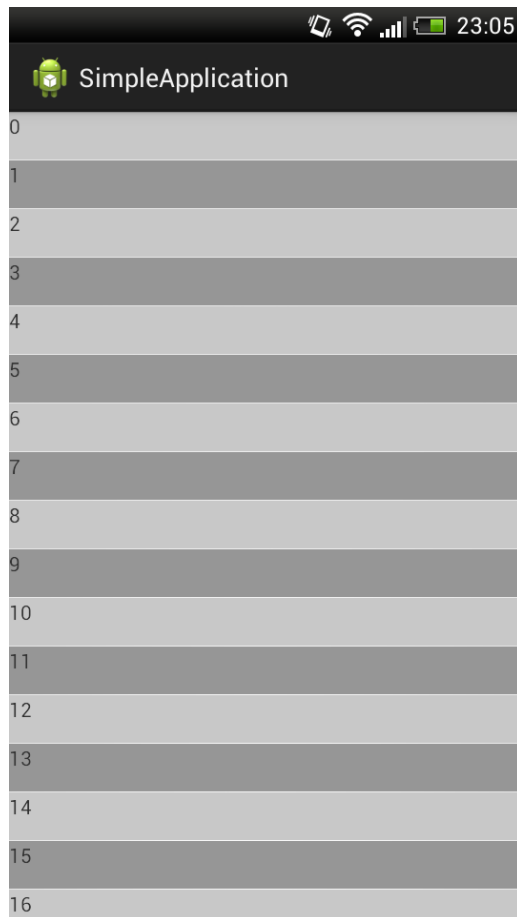
Speciale Views



ListView

- Zoals ScrollView maar specifiek
- Gebruikt ListAdapter voor data

Speciale Views



ListAdapter

- Houdt data vast
- Verzoekt om items zodra nodig
- Houd het efficiënt

Speciale Views

- Aantal items in lijst

```
@Override
public void registerDataSetObserver(DataSetObserver observer) {
    // TODO Auto-generated method stub
}

@Override
public void unregisterDataSetObserver(DataSetObserver observer) {
    // TODO Auto-generated method stub
}

@Override
public int getCount() {
    return 20;
}

@Override
public Object getItem(int position) {
    return position;
}

@Override
public long getItemId(int position) {
    return position;
}

@Override
public boolean hasStableIds() {
    return true;
}

@Override
public View getView(int position, View convertView, ViewGroup parent) {
    TextView tv = new TextView(parent.getContext());
    tv.setText(position+"");
    tv.setBackgroundColor((position%2==0)?Color.rgb(200, 200, 200):Color.rgb(150, 150, 150));
    tv.setHeight(50);
    return tv;
}
```

Speciale Views

- Object in lijst
 - Niet view representatie

```
@Override
public void registerDataSetObserver(DataSetObserver observer) {
    // TODO Auto-generated method stub
}

@Override
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    // TODO Auto-generated method stub
}

@Override
public int getCount() {
    return 20;
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    tv.setText(position+"");
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    tv.setHeight(50);
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}
```

Speciale Views

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@Override
public void registerDataSetObserver(DataSetObserver observer) {
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public View getView(int position, View convertView, ViewGroup parent) {
    TextView tv = new TextView(parent.getContext());
    tv.setText(position+"");
    tv.setBackgroundColor((position%2==0)?Color.rgb(200, 200, 200):Color.rgb(150, 150, 150));
    tv.setHeight(50);
    return tv;
}
```

- Creatie van View
- Meegegeven
 - Positie
 - convertView
 - Voor recyclen
 - Parent
 - Voor o.a. Context

Speciale Views

```
@Override  
public int getItemViewType(int position) {  
    return position%2;  
}
```

```
@Override  
public int getViewTypeCount() {  
    return 2;  
}
```

```
@Override  
public boolean isEmpty() {  
    return false;  
}
```

```
@Override  
public boolean areAllItemsEnabled() {  
    return false;  
}
```

```
@Override  
public boolean isEnabled(int position) {  
    return false;  
}
```

- Voor klikken
- areAllItemsEnabled
 - Voor efficiëntie
- isEnabled
 - Alleen aangeroepen als allItemsEnabled false returned

Speciale Views

```
View v = LayoutInflater.from(this).inflate(R.layout.test, null);
```

Inflator

- Zet XML om in View
- Vereist
 - Layout resource
 - Root

Custom View

Constructor

- Moet super aanroepen met Context
- Gebruik je geen XML?
 - Constructor met alleen Context genoeg

```
package rend1.example.simpleapplication;

import android.content.Context;
import android.util.AttributeSet;
import android.view.View;

public class SimpleView extends View {

    public SimpleView(Context context, AttributeSet attrs, int defStyleAttr) {
        super(context, attrs, defStyleAttr);
        // TODO Auto-generated constructor stub
    }

    public SimpleView(Context context, AttributeSet attrs) {
        super(context, attrs);
        // TODO Auto-generated constructor stub
    }

    public SimpleView(Context context) {
        super(context);
        // TODO Auto-generated constructor stub
    }
}
```


Custom View

```
<include xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content" />
```

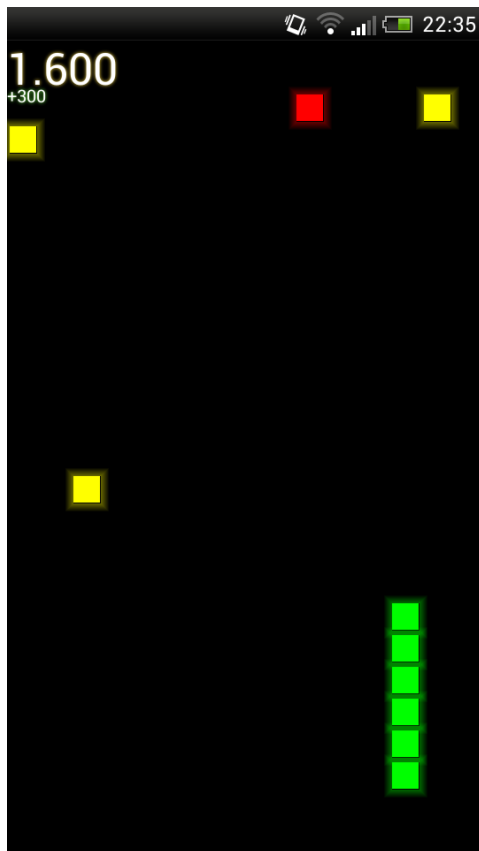
```
public SimpleView(Context context, AttributeSet attrs, int defStyleAttr) {
    super(context, attrs, defStyleAttr);
    // TODO Auto-generated constructor stub
}
```

```
public SimpleView(Context context, AttributeSet attrs) {
    super(context, attrs);
    // TODO Auto-generated constructor stub
}
```

XML

- XML attributes zitten in AttributeSet
- Kunt eigen XML attributen definiëren

Custom View

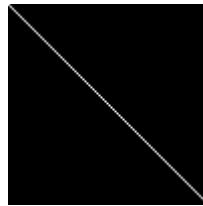


Tekenen

- Spel
 - Speelbord tekenen
- Grafieken
- ...

Custom View

```
@Override
public void onDraw(Canvas canvas)
{
    Paint p = new Paint();
    p.setColor(Color.WHITE);
    canvas.drawColor(Color.BLACK);
    canvas.drawLine(0, 0, 100, 100, p);
}
```



Tekenen

- Override onDraw
- Paint bevat eigenschappen
- Canvas kan tekenen met paint.
- Alleen *light-weight*

Threads

```
FATAL EXCEPTION: Thread-5192
android.view.ViewRootImpl$CalledFromWrongThreadException: Only the
original thread that created a view hierarchy can touch its views.
at android.view.ViewRootImpl.checkThread(ViewRootImpl.java:5127)
at android.view.ViewRootImpl.invalidateChildInParent(ViewRootImpl.
java:1015)
at android.view.ViewGroup.invalidateChild(ViewGroup.java:4084)
at android.view.View.invalidate(View.java:10289)
at android.widget.TextView.invalidateRegion(TextView.java:4608)
at android.widget.TextView.invalidateCursor(TextView.java:4551)
at android.widget.TextView.spanChange(TextView.java:7626)
at android.widget.TextView$ChangeWatcher.onSpanAdded(TextView.java
:9443)
at android.text.SpannableStringBuilder.sendSpanAdded(SpannableStri
ngBuilder.java:979)
```

- GUI Thread
 - Update Views
 - Gesture afhandeling
- Eigen Threads
 - Update View niet altijd mogelijk (herhaling)
 - *Heavy-weight* prep-work

Gestures

Listeners

- Event driven
- Methodes worden aangeroepen bij gebeurtenis
- Voorbeelden
 - onTouch
 - onBackPressed

Gestures

Touches

- `onTouch(View, MotionEvent)`
- Aangeropen als view met listener wordt aangeraakt
 - Welke view?
 - Waar?
 - Hoe?
- Returned boolean
 - Has event been consumed?
- `View.setOnTouchListener`

Gestures

Clicks

- `onClick(View)`
- Aangeropen als view met listener wordt aangeklikt
 - Welke view?
- `View.setOnClickListener`

Gestures

Long Clicks

- `onLongClick(View)`
- Aangeropen als view met listener wordt aangeklikt en ingehouden
 - Welke view?
- Returned boolean
 - Has event been consumed?
- `View.setOnLongClickListener`

Gestures

Gestures

- `onDoubleTab`, `onFling`, `onSignleTab`, ...
- Aangeropen als *complexere* bediening wordt gedaan
 - Welke view?
- Sommige returnen boolean
 - Has event been consumed?
- `View.setOnGestureListener`
- `View.setOnDoubleTabListener`
- ...

Android

GEHEUGEN

DEVICE

Geheugen

- Intern geheugen
- SharedPreferences
- Extern geheugen
- SQLite

SharedPreferences

```
SharedPreferences s = this.getSharedPreferences("name", Context.MODE_PRIVATE);
SharedPreferences.Editor e = s.edit();
e.putBoolean("test", true);
if(e.commit())
{
    // value stored
}
else
    throw new IllegalStateException("Couldn't store data");
```

- Naam
- Modus
- Waarde opvragen
 - Float
 - Int
 - Long
 - String
- Opslaan
 - Aparte Editor

SharedPreferences.Editor

```
SharedPreferences s = this.getSharedPreferences("name", Context.MODE_PRIVATE);
if(s.edit().putBoolean("test", true).commit())
{
    // value stored
}
else
    throw new IllegalStateException("Couldn't store data");
```

- Vaker gebruikte vorm
 - Builder classes
- Elke operatie returned zichzelf

```
public class Editor {

    public Editor putBoolean(String name, boolean value)
    {
        // do something to store
        return this;
    }

}
```

Extern geheugen

```
File sdcard = Environment.getExternalStorageDirectory();  
File privateDir = this.getExternalFilesDir("subdir");
```

- SDCard
- “*Privé*” geheugen
- Vereist permissies
 - `Android.permission.WRITE_EXTERNAL_STORAGE`
 - `Android.permission.READ_EXTERNAL_STORAGE`

Android | Handige links

- **Uitleg**

- <http://developer.android.com>
- <http://developer.android.com/training/>
- <http://developer.android.com/guide/>

- **API**

- <http://developer.android.com/reference/>

- **Specifieke problemen**

- *stackoverflow.com (via google)*