A Developers Perspective on Google Glass

Pär Sikö
@per_siko

JAYWAY

Part 1

What it feels like?

What it feels like?

What it feels like?

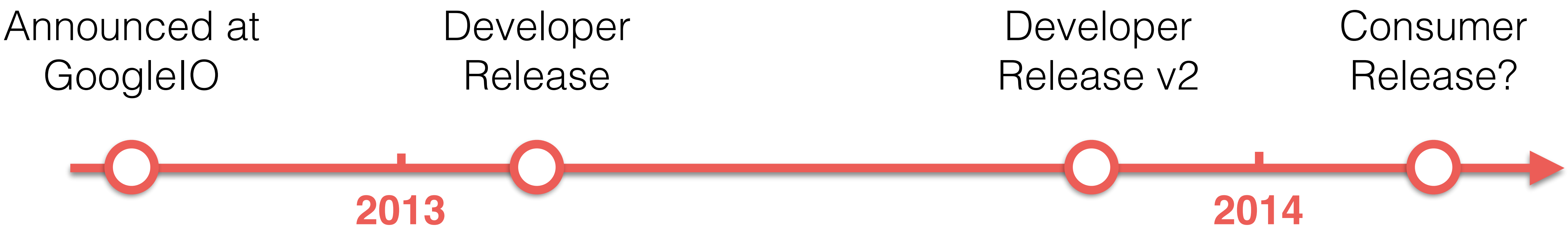
JAYWAY

What it feels like?

What it feels like?

Titanium

History



Announced at GoogleIO

Developer Release

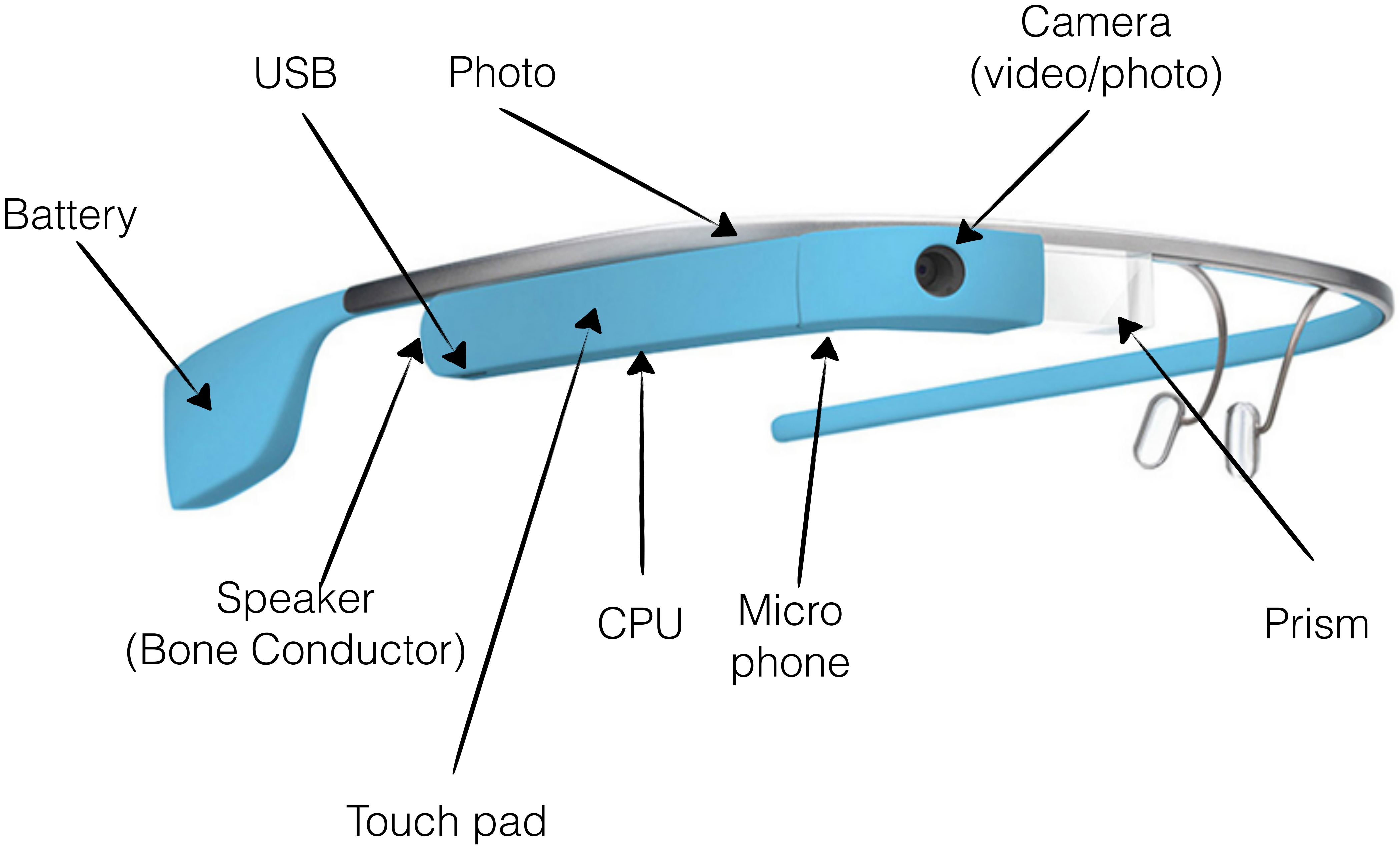
Developer Release v2

Consumer Release?

2013

2014

Google Glass



Battery

USB

Photo

Camera (video/photo)

Speaker (Bone Conductor)

Touch pad

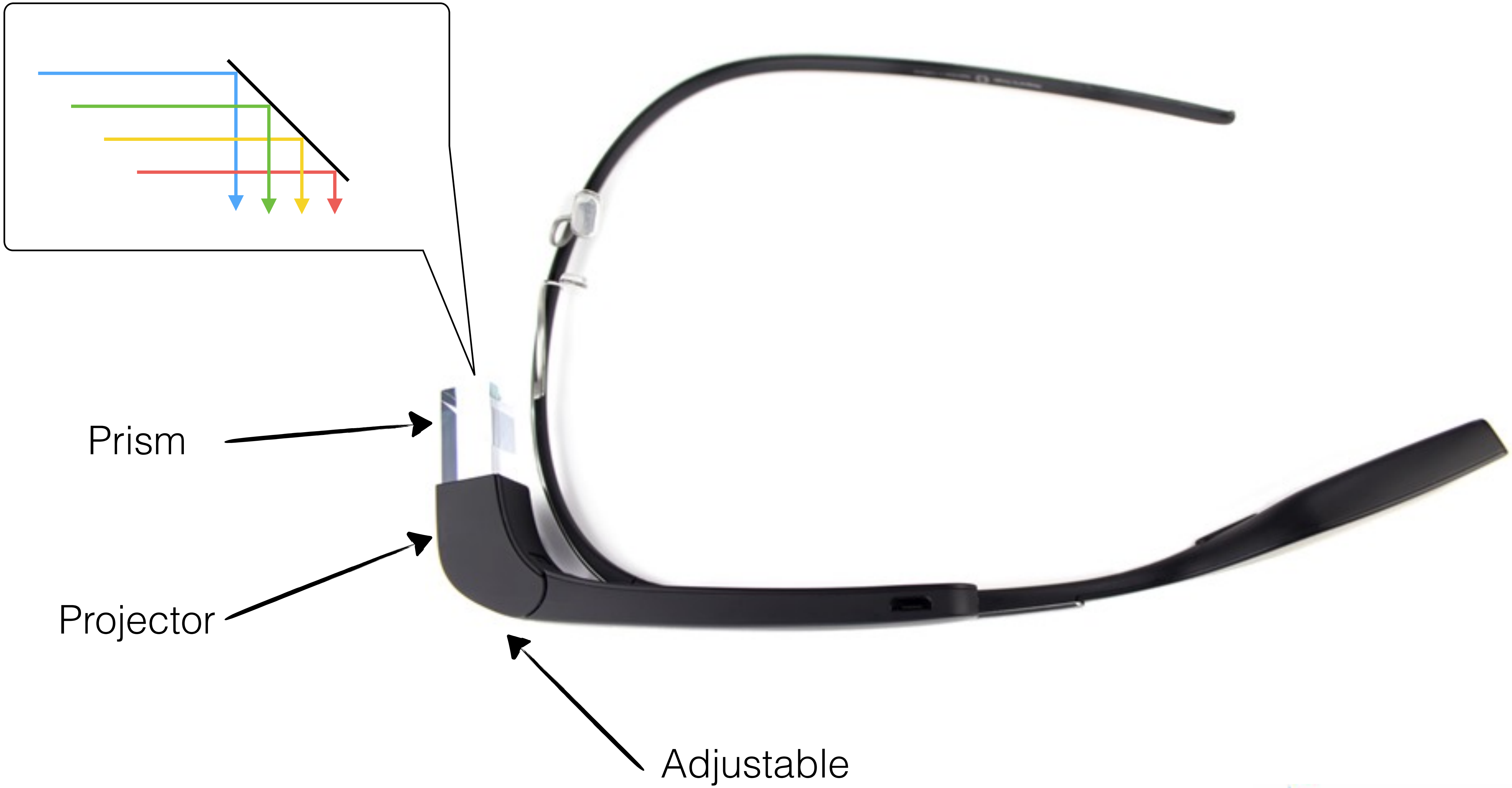
CPU

Micro phone

Prism

JAYWAY

Google Glass



Prism

Projector

Adjustable

JAYWAY

Specification

Display: 640 x 360

Android Version: 4.0.3 (API Level 15)

Processor: TI OMAP 4430 processor

RAM: 1GB

Memory: 16GB

Camera: 5-megapixel (720p video)

Sensors

ACCELEROMETER

GRAVITY

GYROSCOPE

LIGHT

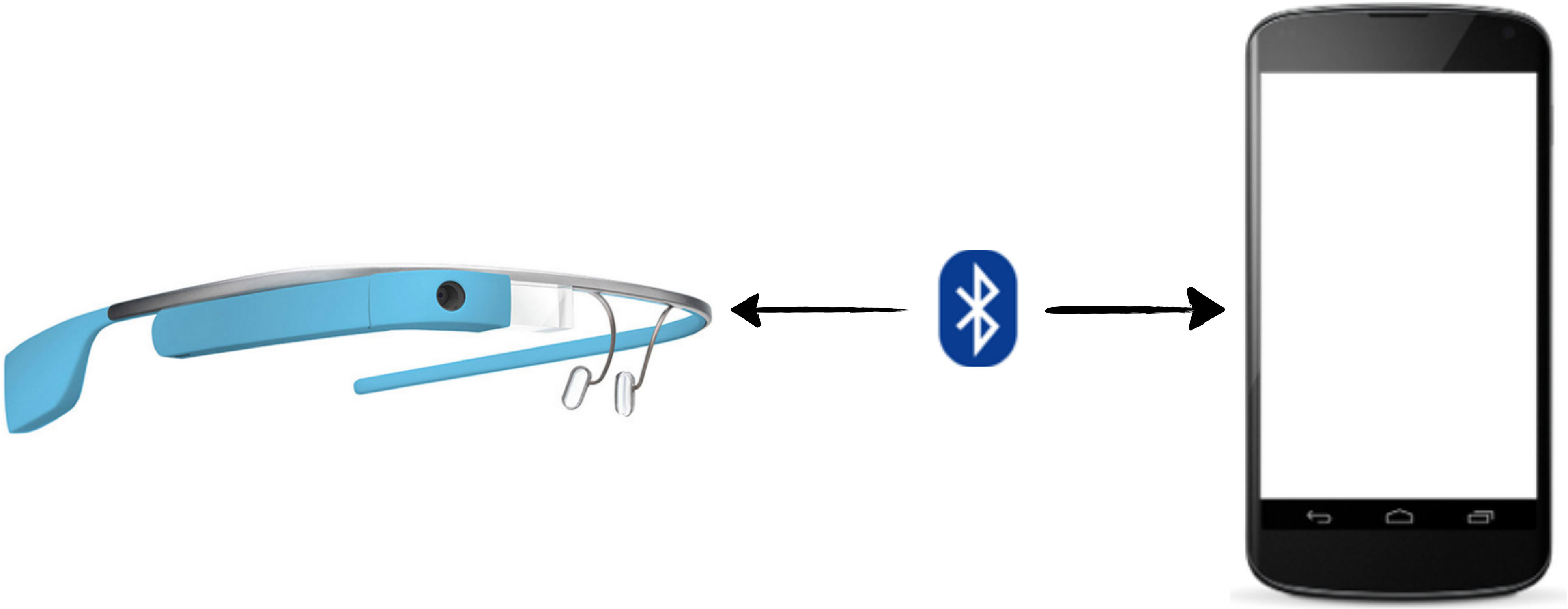
LINEAR ACCELERATION

MAGNETIC FIELD

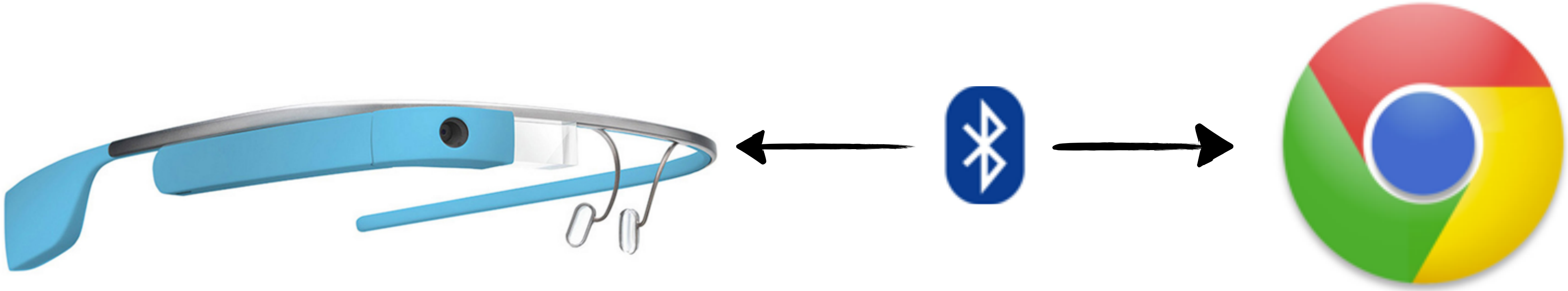
ORIENTATION (deprecated)

ROTATION VECTOR

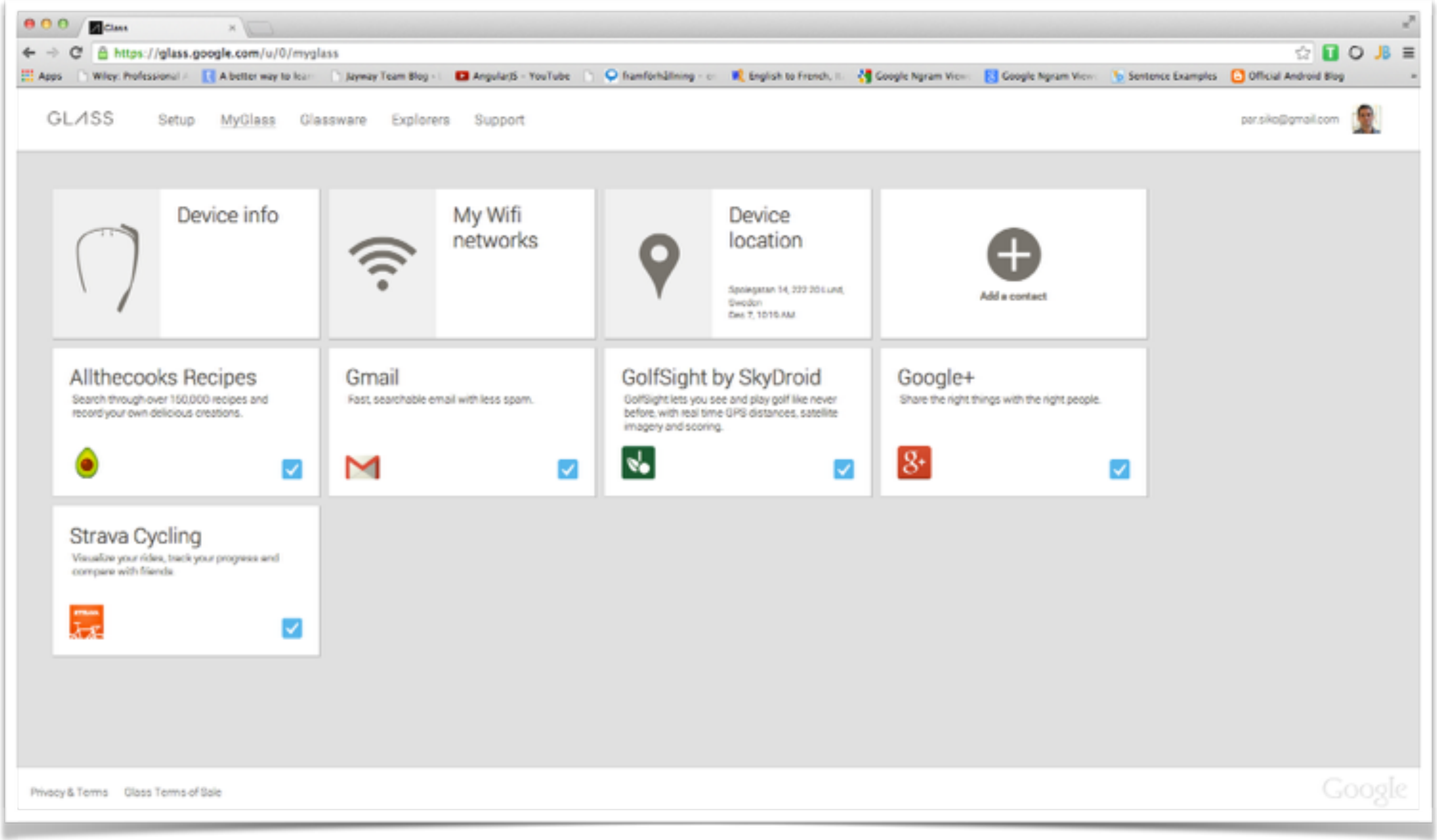
Setup



Setup



Desktop



Device info

My Wifi networks

Device location

Spolegatan 14, 222 20 Lund, Sweden
Dec 7, 10:16 AM

⊕ Add a contact

Allthecooks Recipes
Search through over 150,000 recipes and record your own delicious creations. ☑

Gmail
Fast, searchable email with less spam. ☑

GolfSight by SkyDroid
GolfSight lets you see and play golf like never before, with real time GPS distances, satellite imagery and scoring. ☑

Google+
Share the right things with the right people. ☑

Strava Cycling
Visualize your rides, track your progress and compare with friends. ☑

JAYWAY

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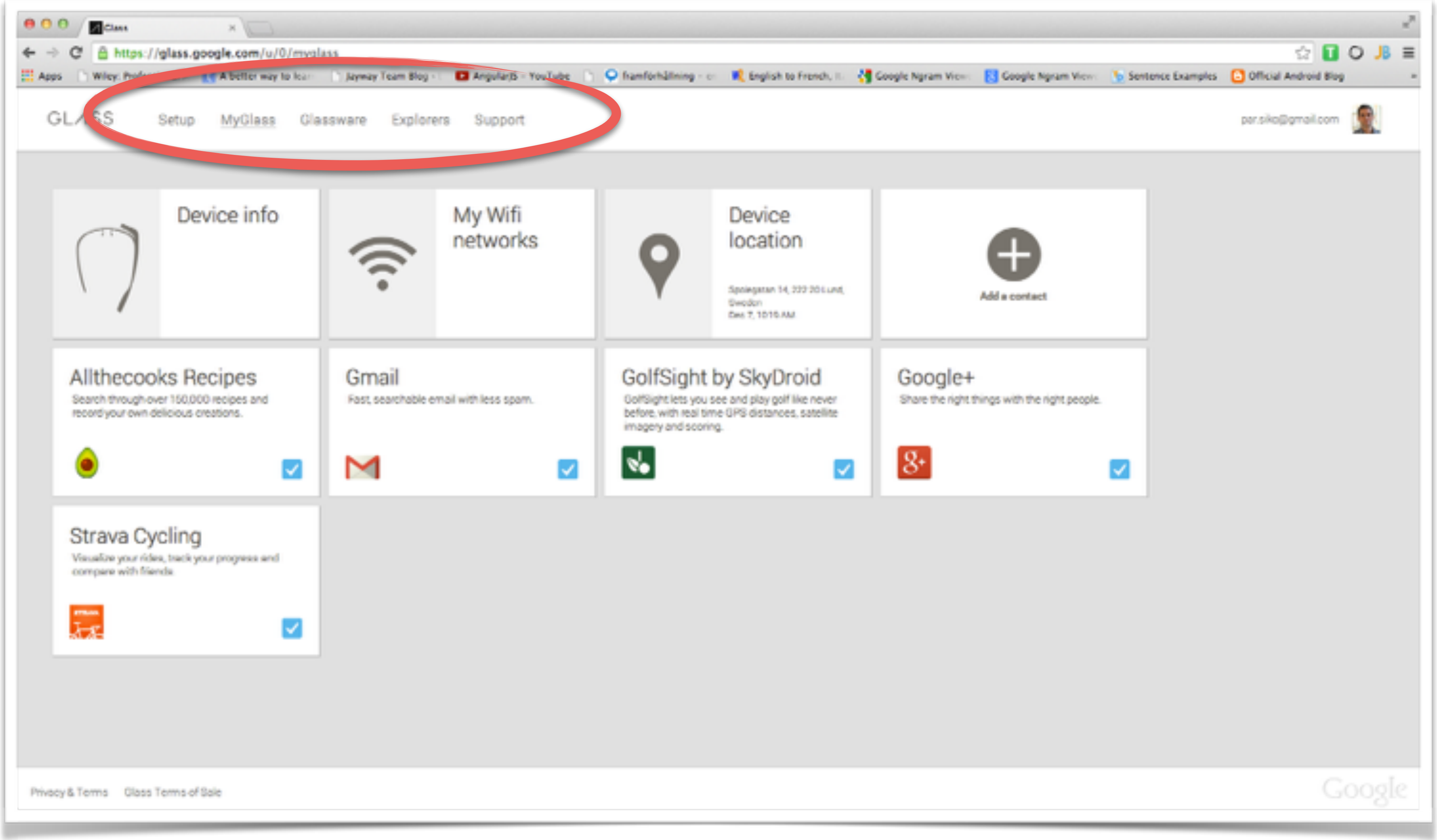

Glass

https://glass.google.com/u/0/myglass

Apps · Wiley: Profe… · A better way to lea… · Jayway Team Blog · AngularJS - YouTube · framförhållning · English to French, … · Google Ngram View… · Google Ngram View… · Sentence Examples · Official Android Blog

GLASS Setup MyGlass Glassware Explorers Support

par.siko@gmail.com

Device info

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Device location

Spolegatan 14, 222 20 Lund, Sweden
Dec 7, 10:10 AM

Add a contact

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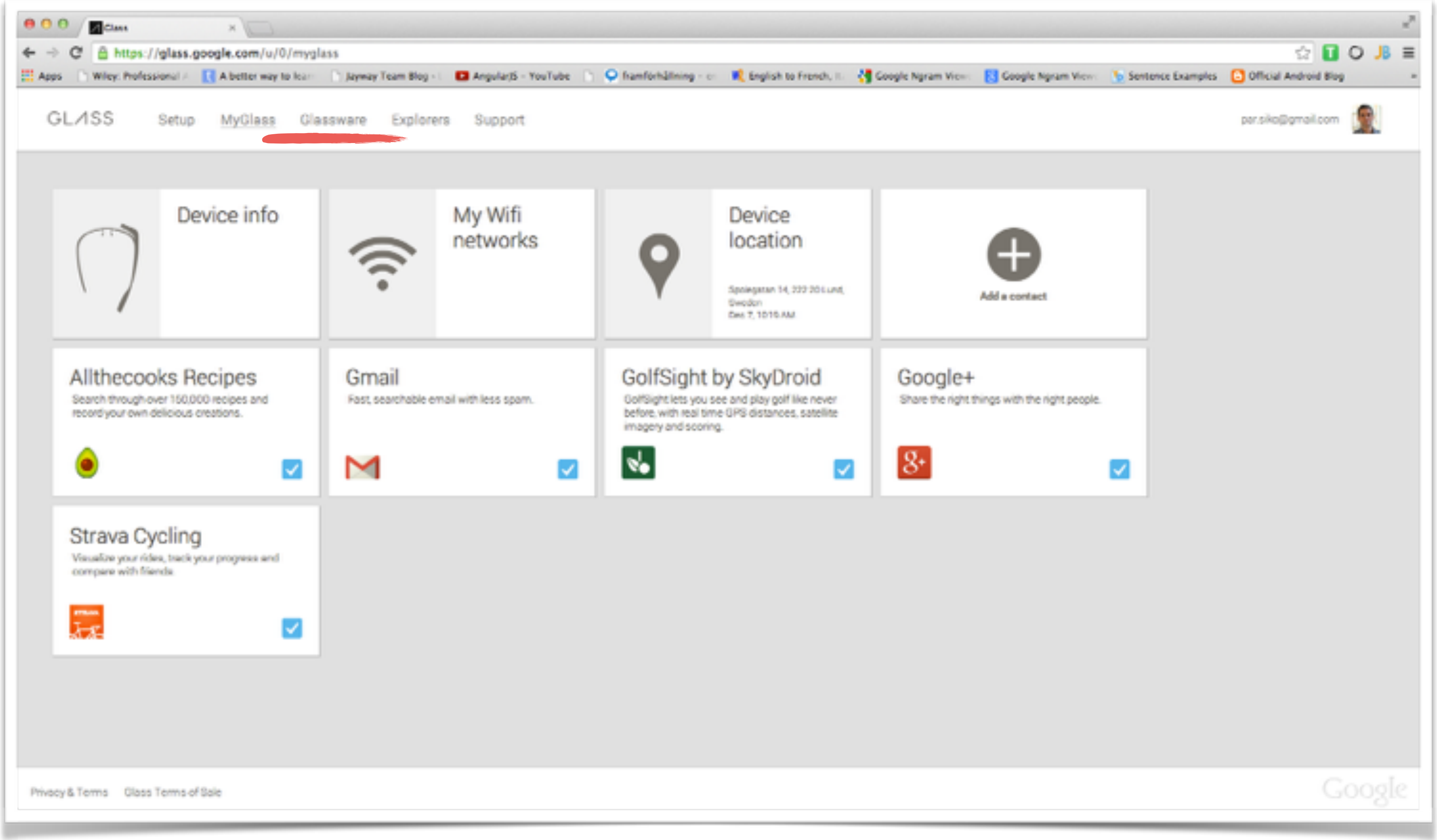
Privacy & Terms Glass Terms of Sale

Google

Desktop



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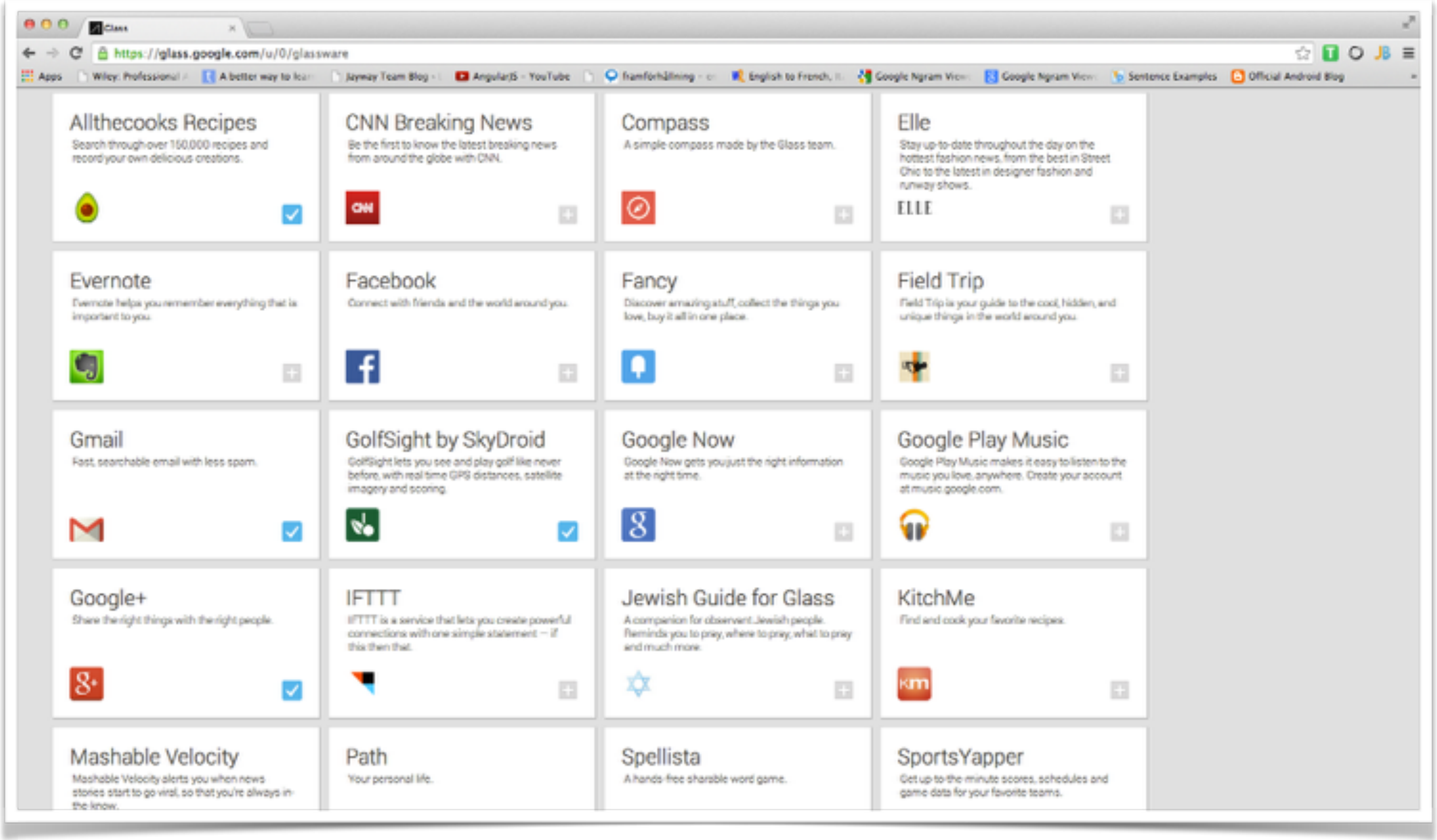

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☑

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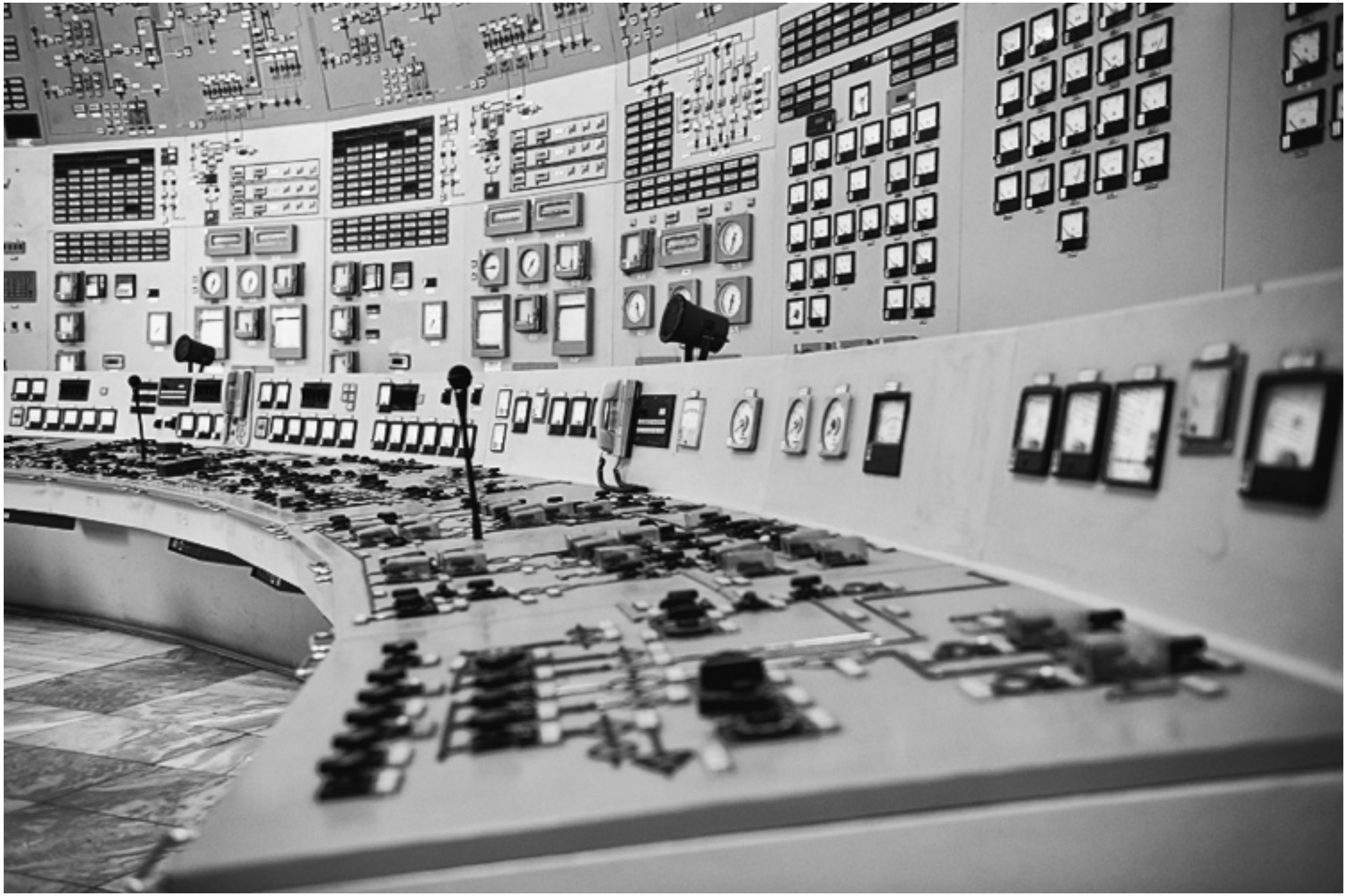
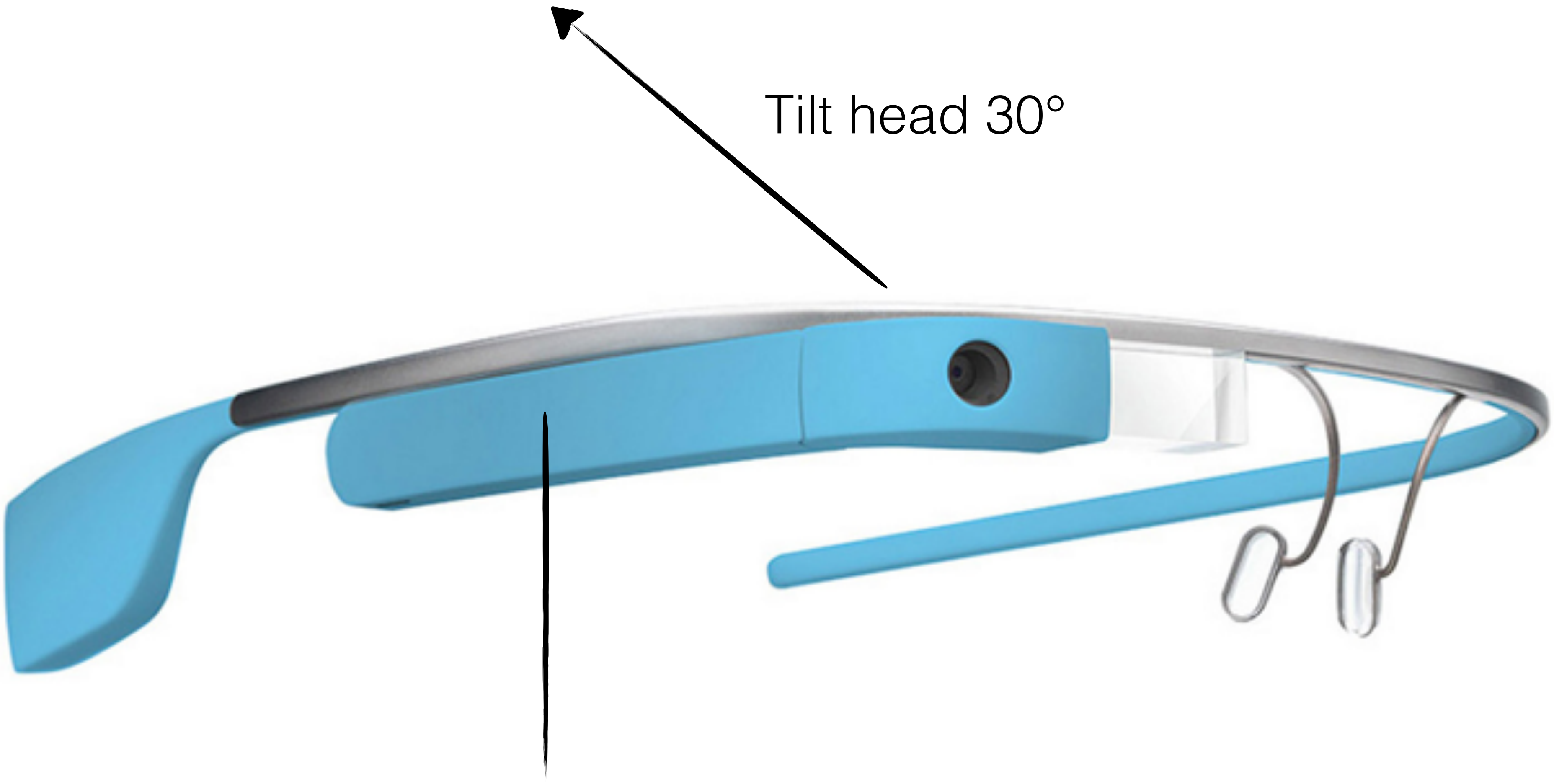
JAYWAY



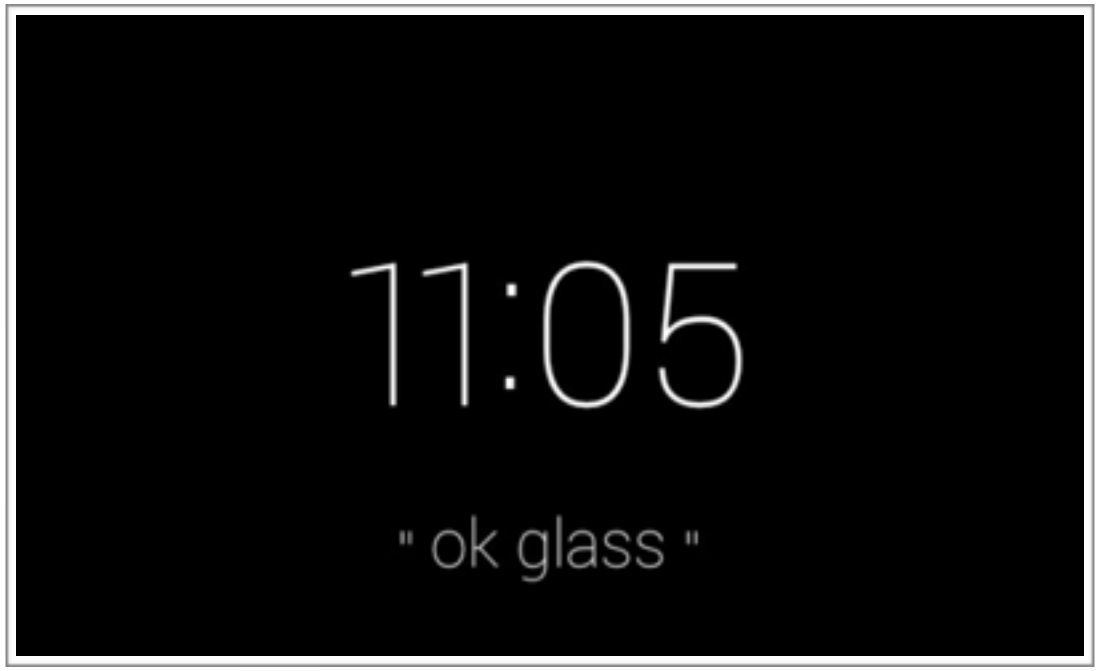
Activate Glass



Tilt head 30°

Single tap

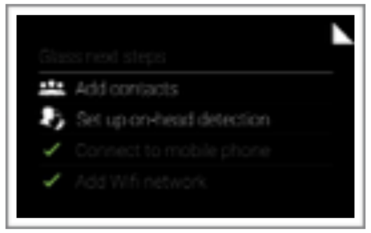
Timeline



11:05

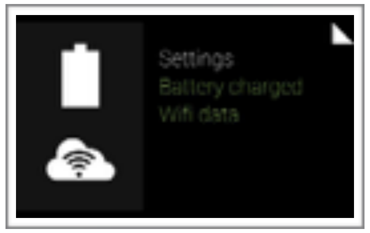
" ok glass "

Timeline

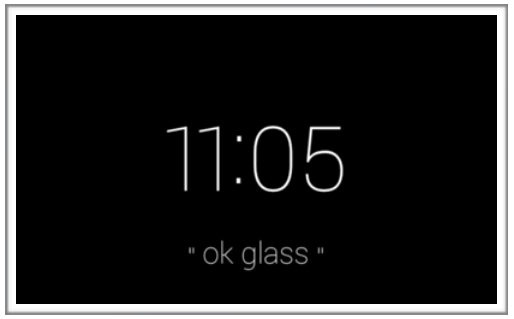


Glass next steps

- Add contacts
- Set up on-head detection
- ✓ Connect to mobile phone
- ✓ Add Wifi network



Settings
Battery charged
Wifi data



11:05

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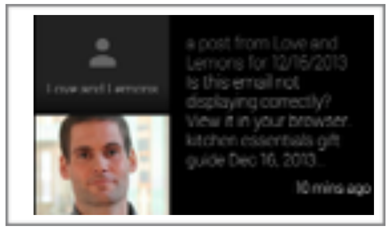
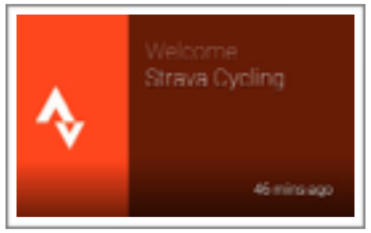


Love and Lemons

a post from Love and Lemons for 12/16/2013 Is this email not displaying correctly? View it in your browser. kitchen essentials gift guide Dec 16, 2013...

10 mins ago

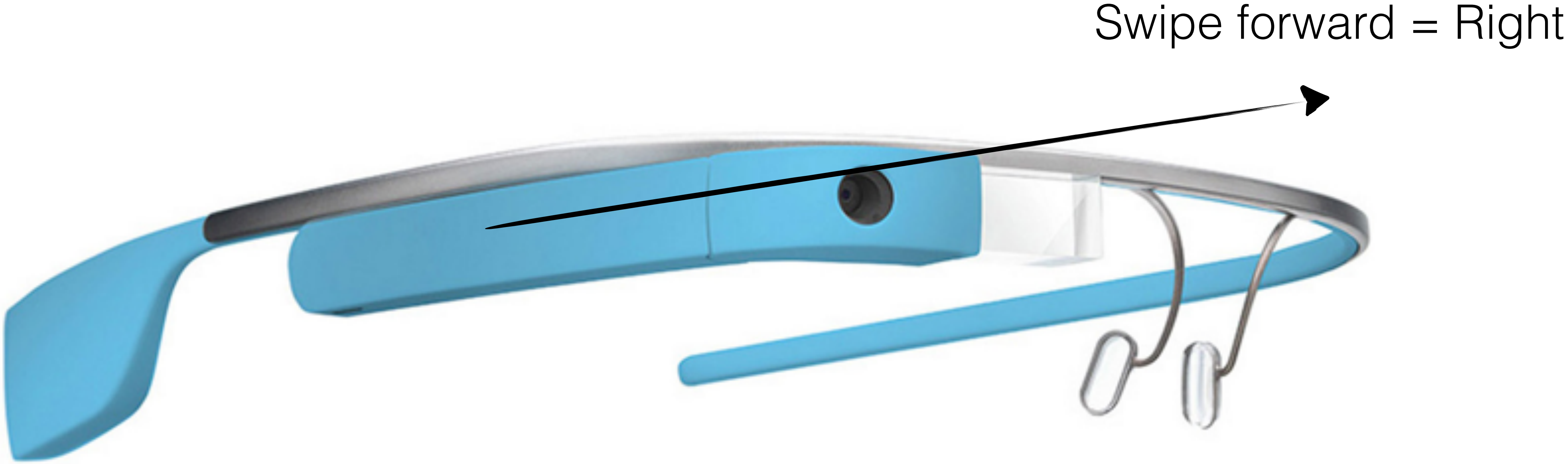


Welcome
Strava Cycling

46 mins ago

Future/Ongoing **Present** **Past**

Google Glass

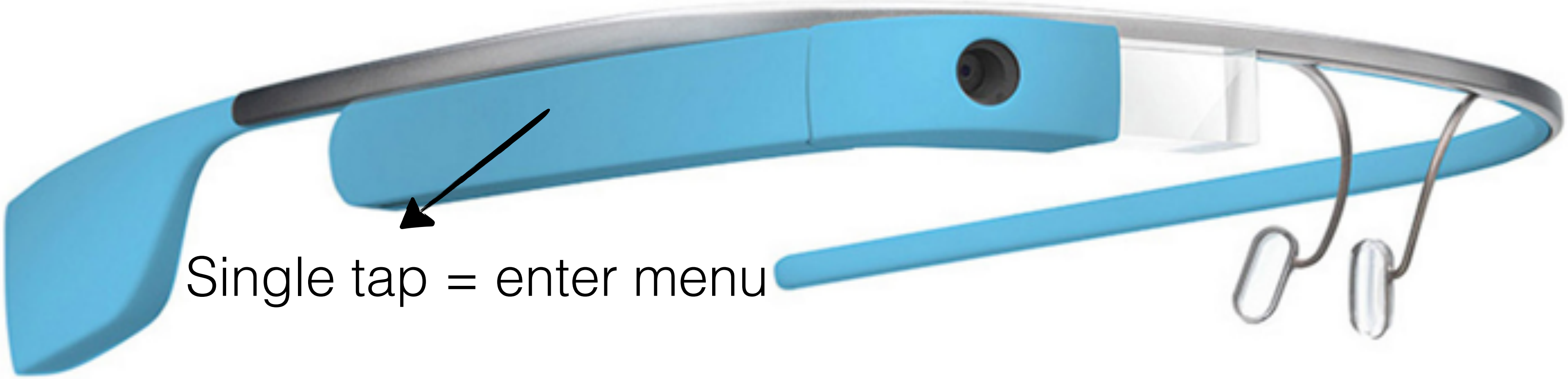


Swipe forward = Right

Google Glass

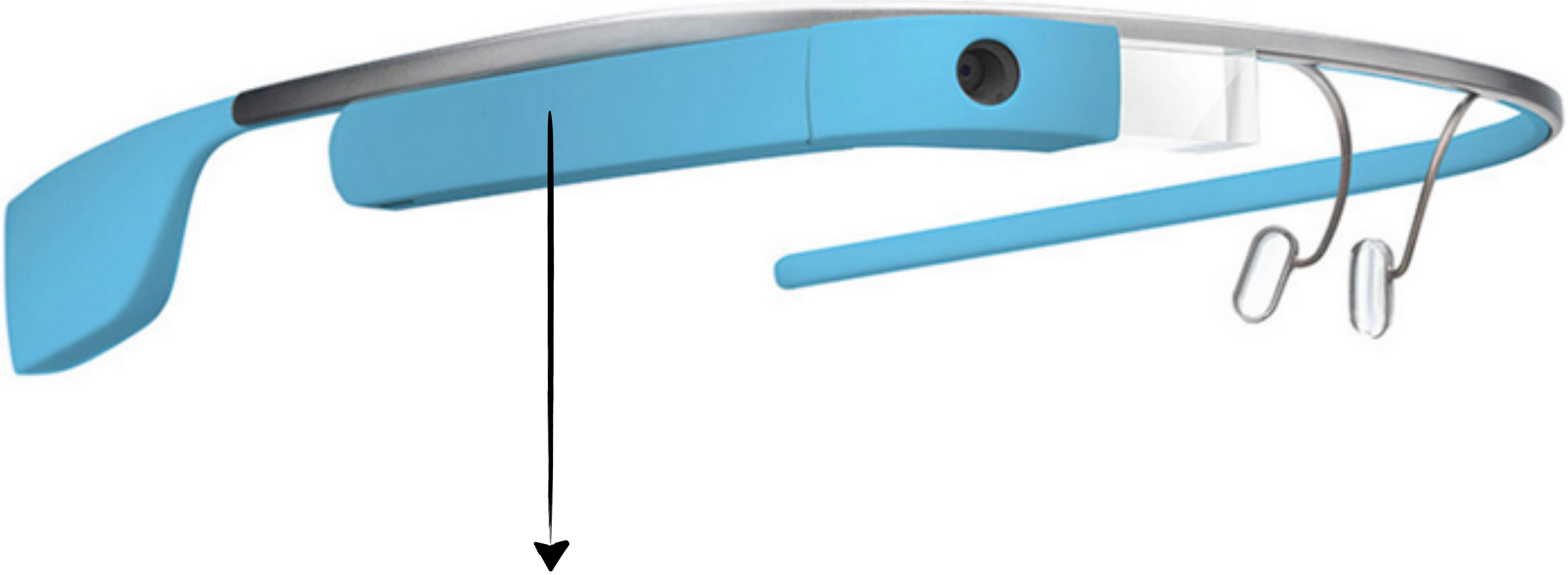
Swipe back = Left

Google Glass



Single tap = enter menu

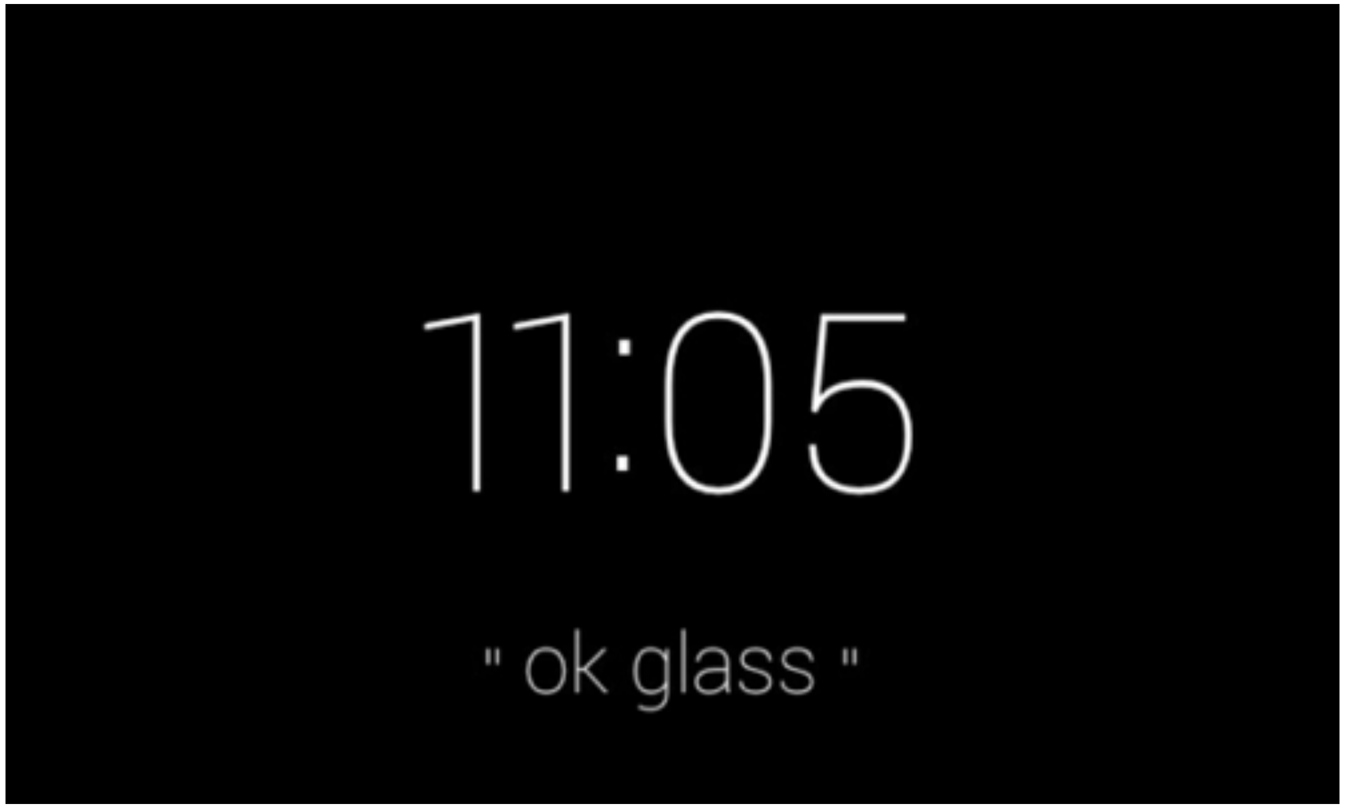
Google Glass



Swipe down = Back

JAYWAY

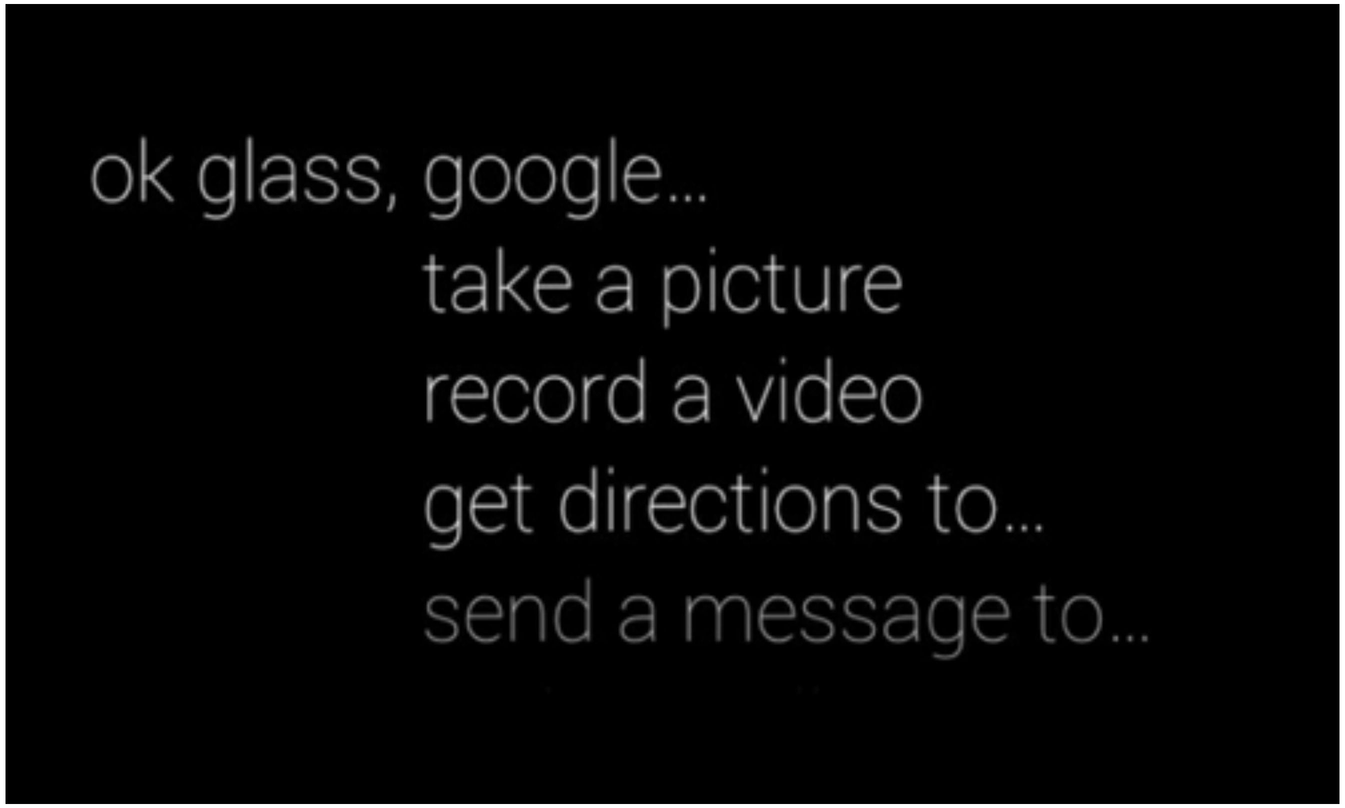
Menu



11:05

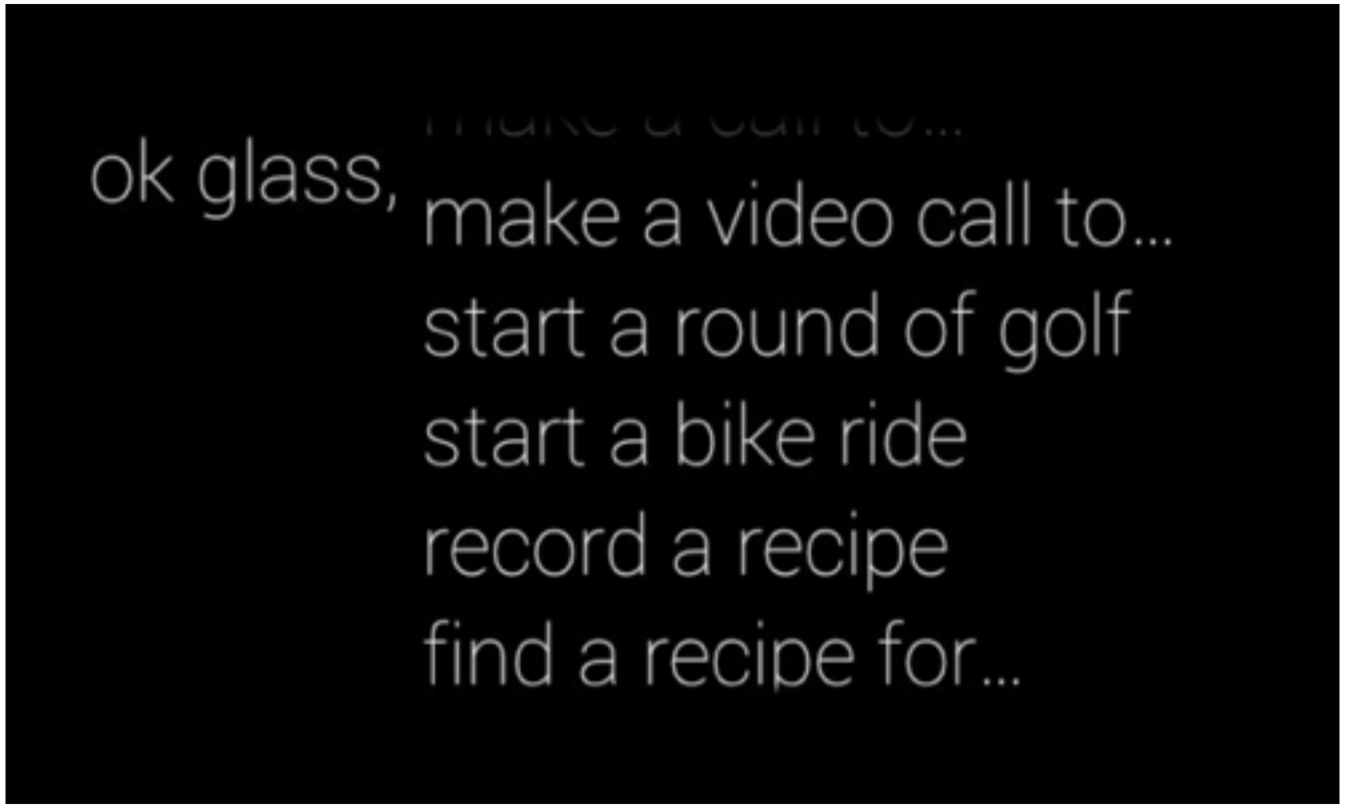
" ok glass "

Menu



ok glass, google…
take a picture
record a video
get directions to…
send a message to…

Menu



ok glass,

make a call to…

make a video call to…

start a round of golf

start a bike ride

record a recipe

find a recipe for…

Demo

JAYWAY

Part 2

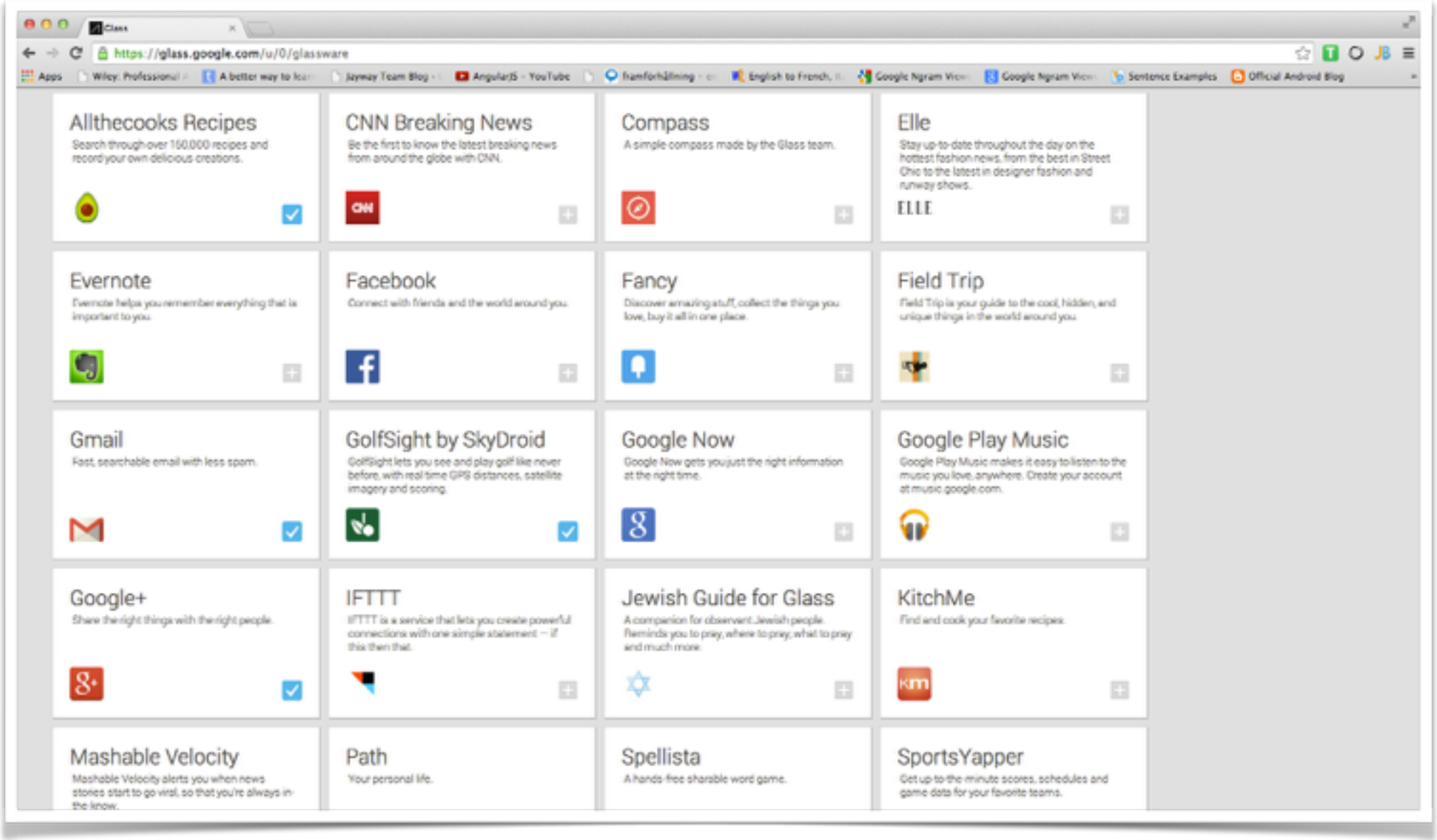
Building Applications

Building Applications

Glassware
(Mirror API)

Native

Glassware



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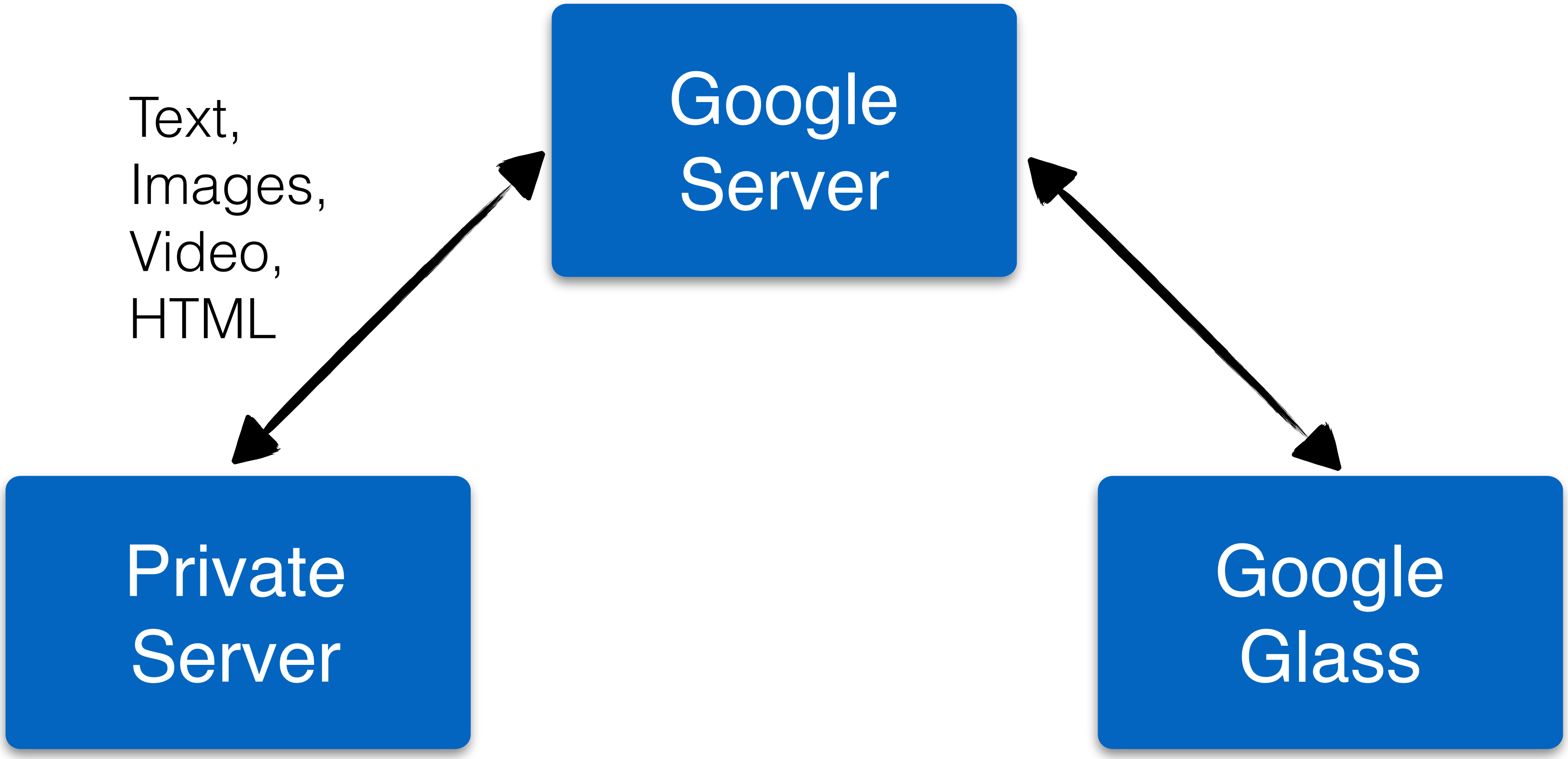
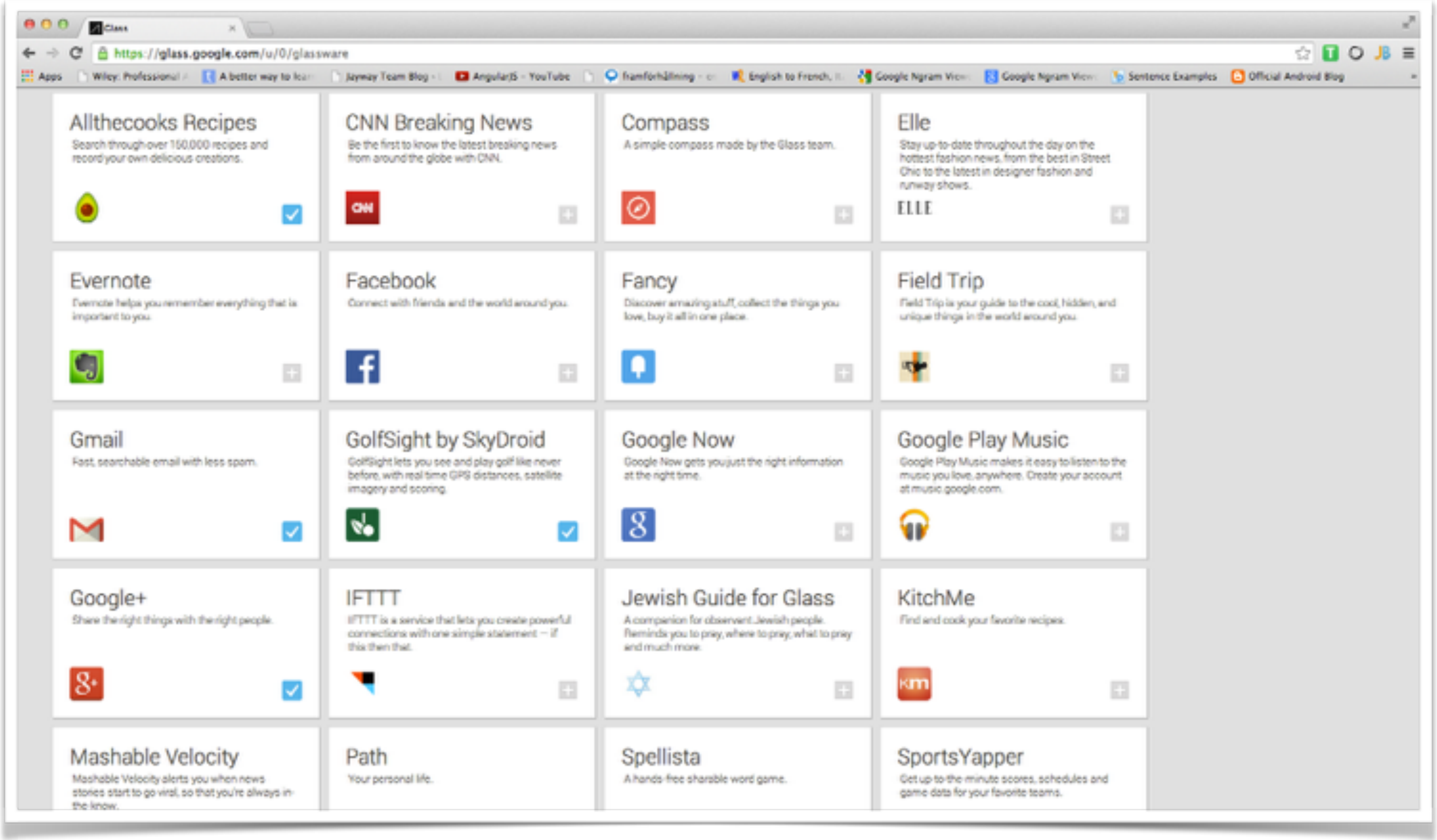
Glassware


Google Server
Text,
Images,
Video,
HTML
Private Server
Google Glass

Glassware



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Get up-to-the minute scores, schedules and game data for your favorite teams.

JAYWAY

Mirror API

Watch Mattias Erlö’s video

GOOGLE GLASS

AN INTRODUCTION FOR DEVELOPERS

By Mattias Erlö

http://vimeo.com/79402551

Building Applications

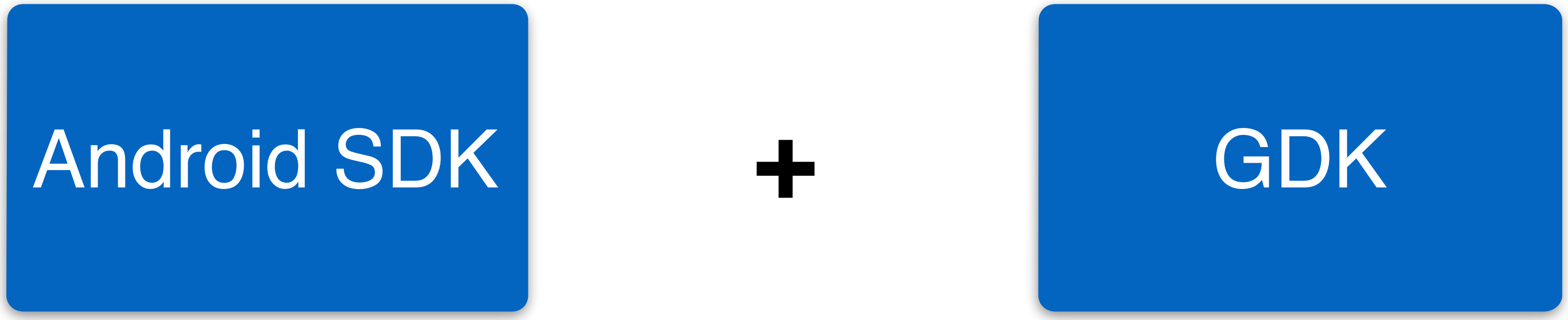
Glassware

Native

Native Applications

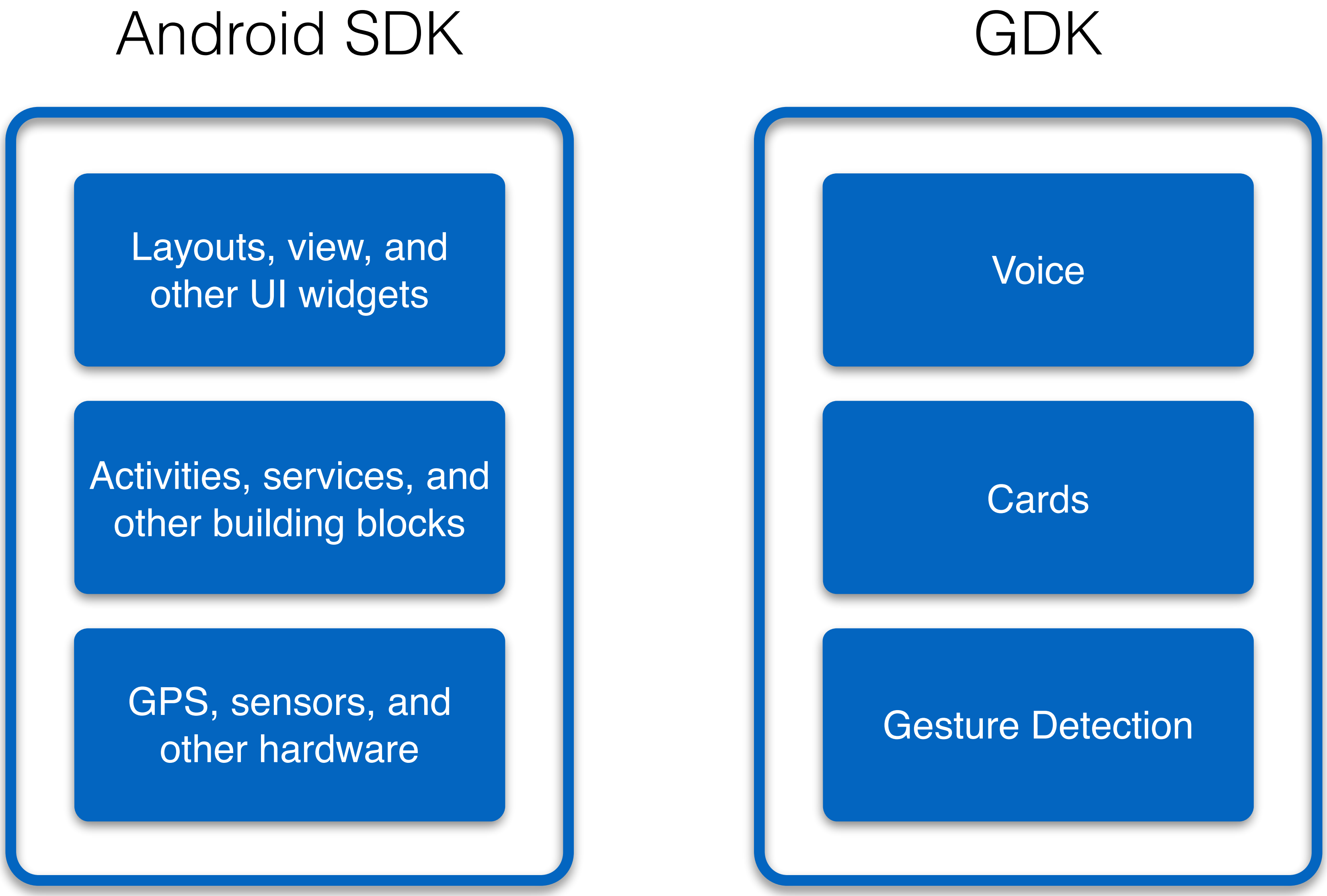
Android SDK

Native Applications



Android SDK + GDK

GDK Stack



Android SDK

Layouts, view, and other UI widgets

Activities, services, and other building blocks

GPS, sensors, and other hardware

GDK

Voice

Cards

Gesture Detection

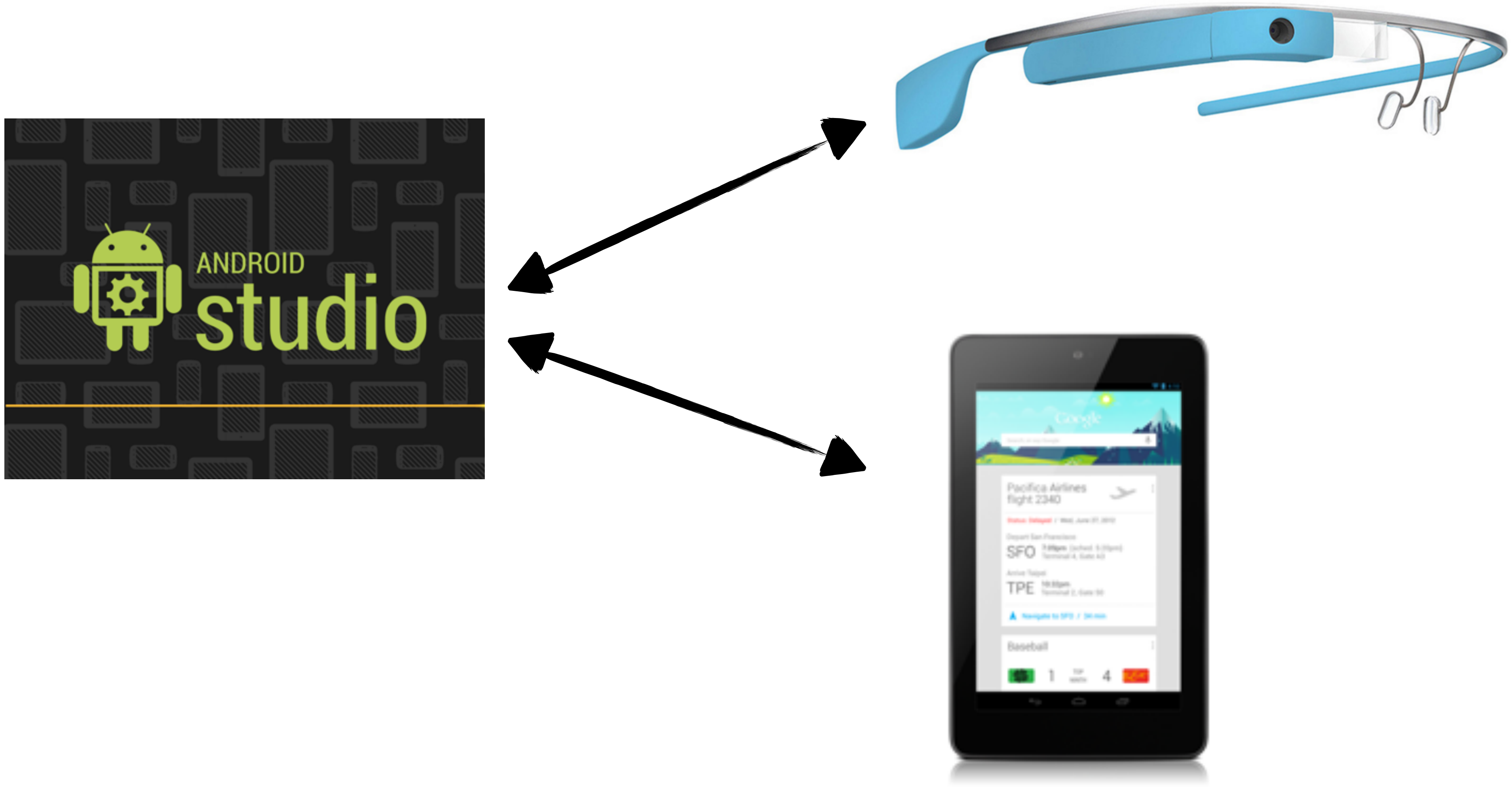
JAYWAY

A Simple application

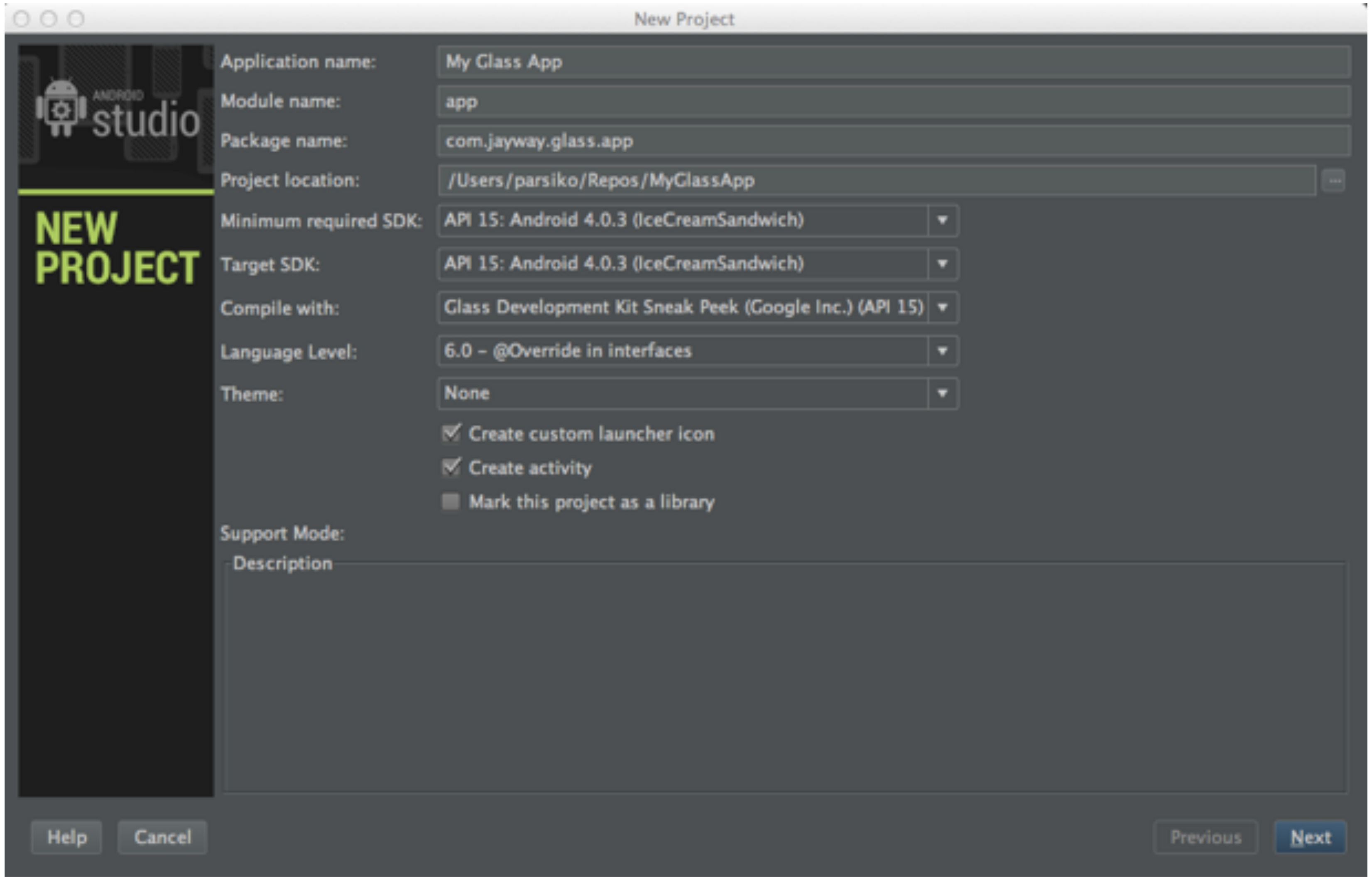
Hello Beer

Requirements & Setup

Requirements & Setup



Create project



Application name: My Glass App

Module name: app

Package name: com.jayway.glass.app

Project location: /Users/parsiko/Repos/MyGlassApp

Minimum required SDK: API 15: Android 4.0.3 (IceCreamSandwich)

Target SDK: API 15: Android 4.0.3 (IceCreamSandwich)

Compile with: Glass Development Kit Sneak Peek (Google Inc.) (API 15)

Language Level: 6.0 – @Override in interfaces

Theme: None

☑ Create custom launcher icon

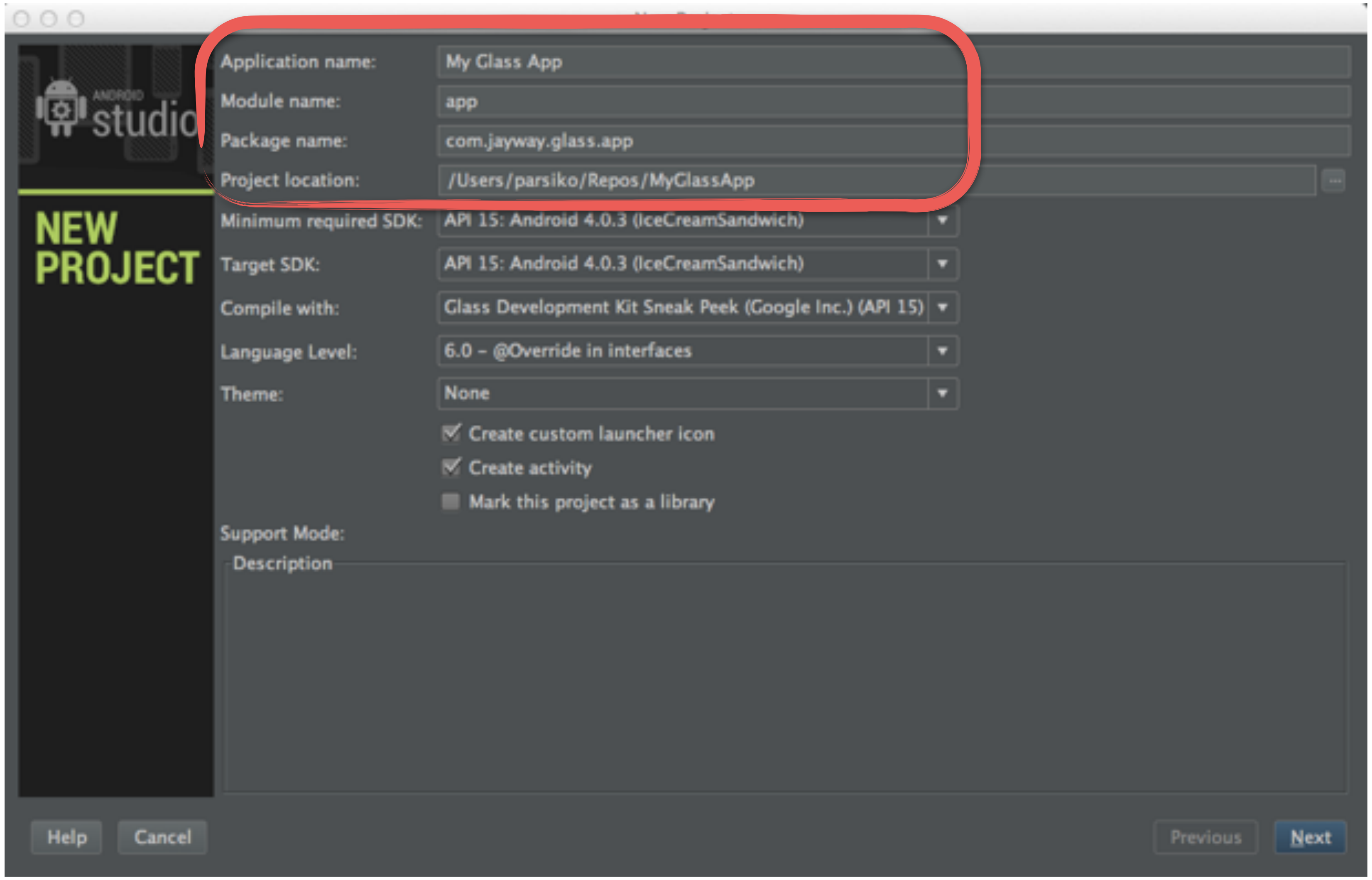
☑ Create activity

☐ Mark this project as a library

Support Mode:

Description

Create project



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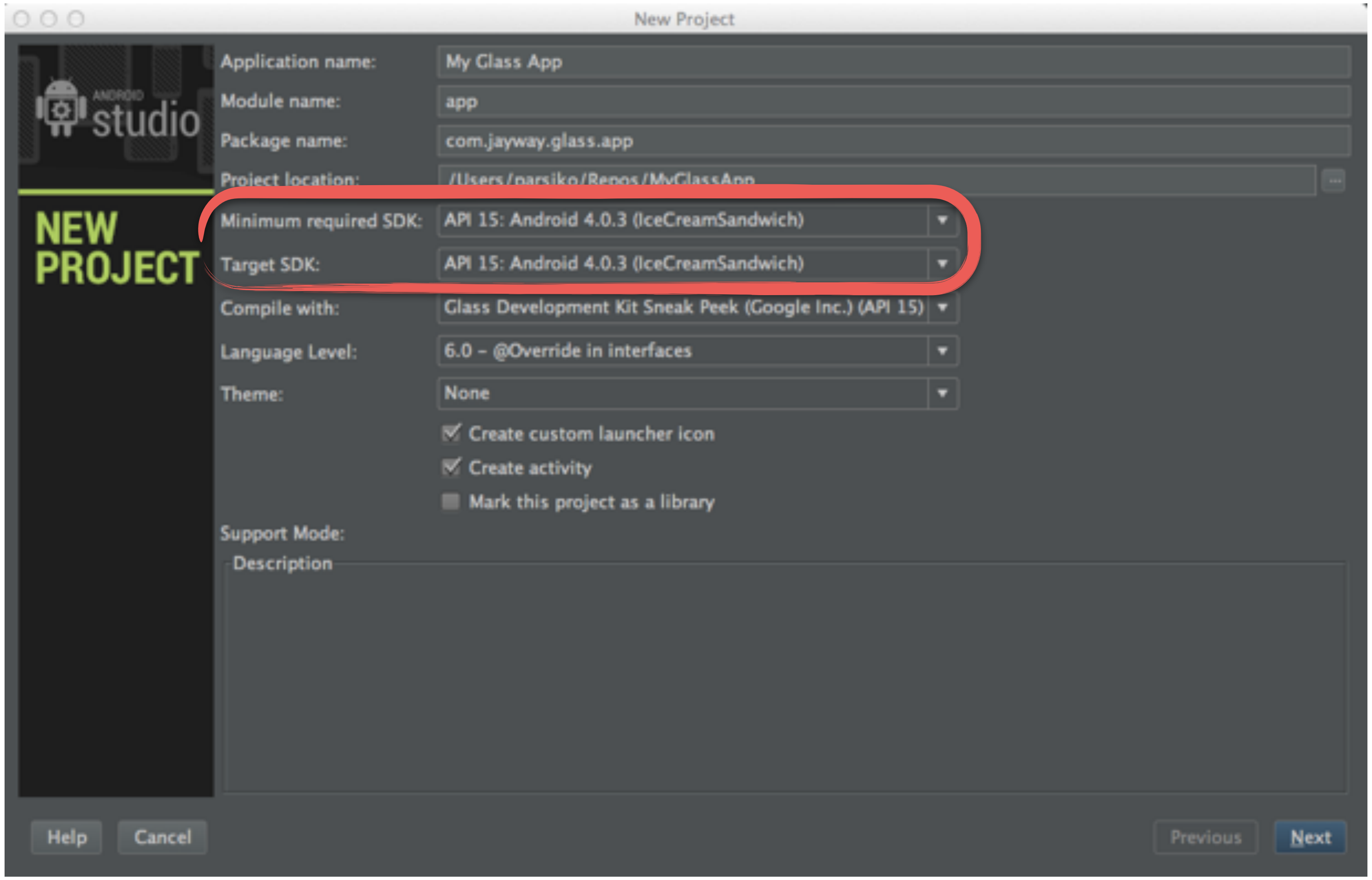
☑ Create activity

□ Mark this project as a library

Support Mode:

Description

Create project



New Project

Application name: My Glass App

Module name: app

Package name: com.jayway.glass.app

Project location: /Users/parsiko/Repos/MyGlassApp

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Compile with: Glass Development Kit Sneak Peek (Google Inc.) (API 15)

Language Level: 6.0 – @Override in interfaces

Theme: None

☑ Create custom launcher icon

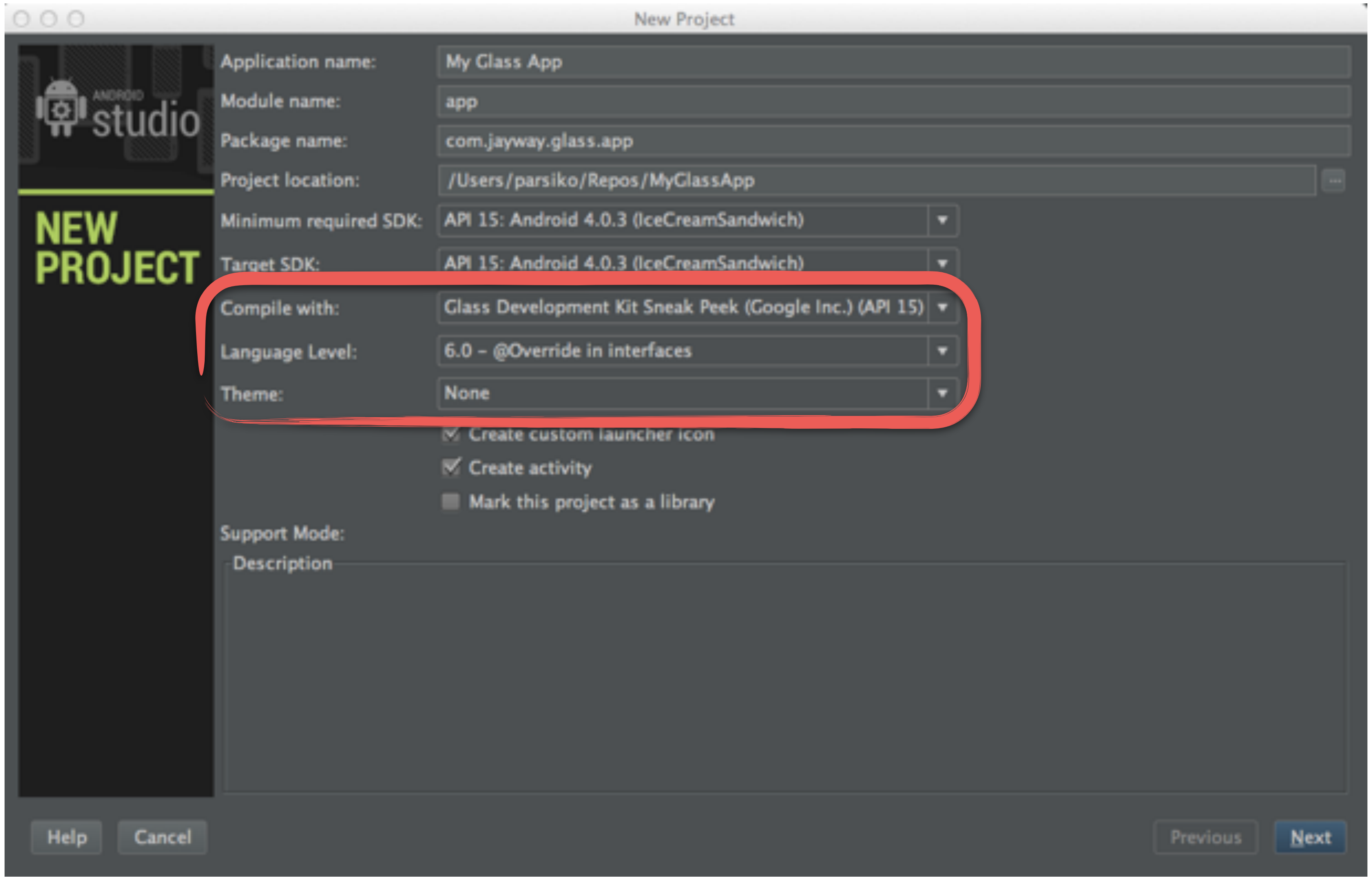
☑ Create activity

□ Mark this project as a library

Support Mode:

Description

Create project



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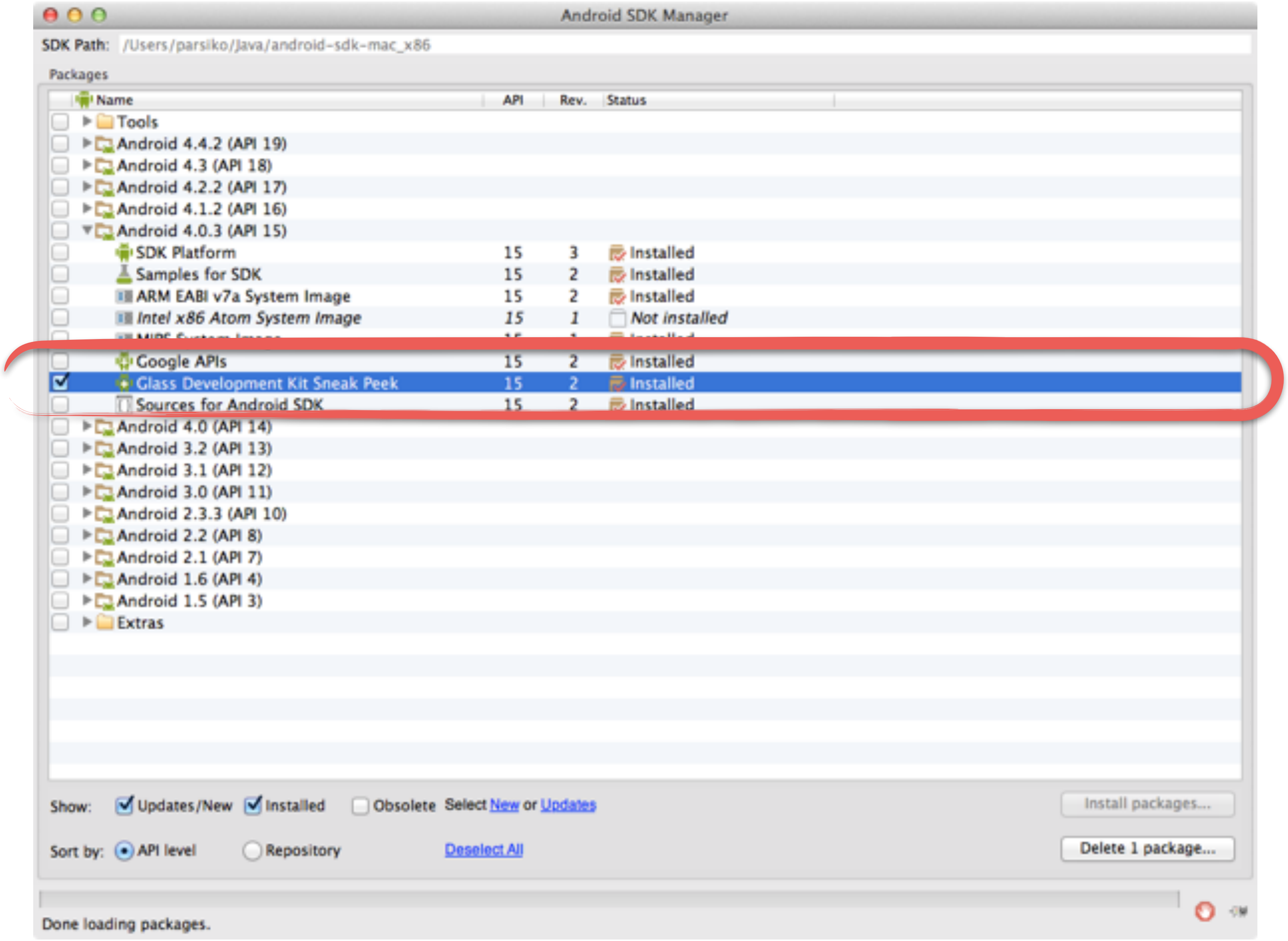
Support Mode:

Description

Create project



Android SDK Manager

SDK Path: /Users/parsiko/Java/android-sdk-mac_x86

Packages

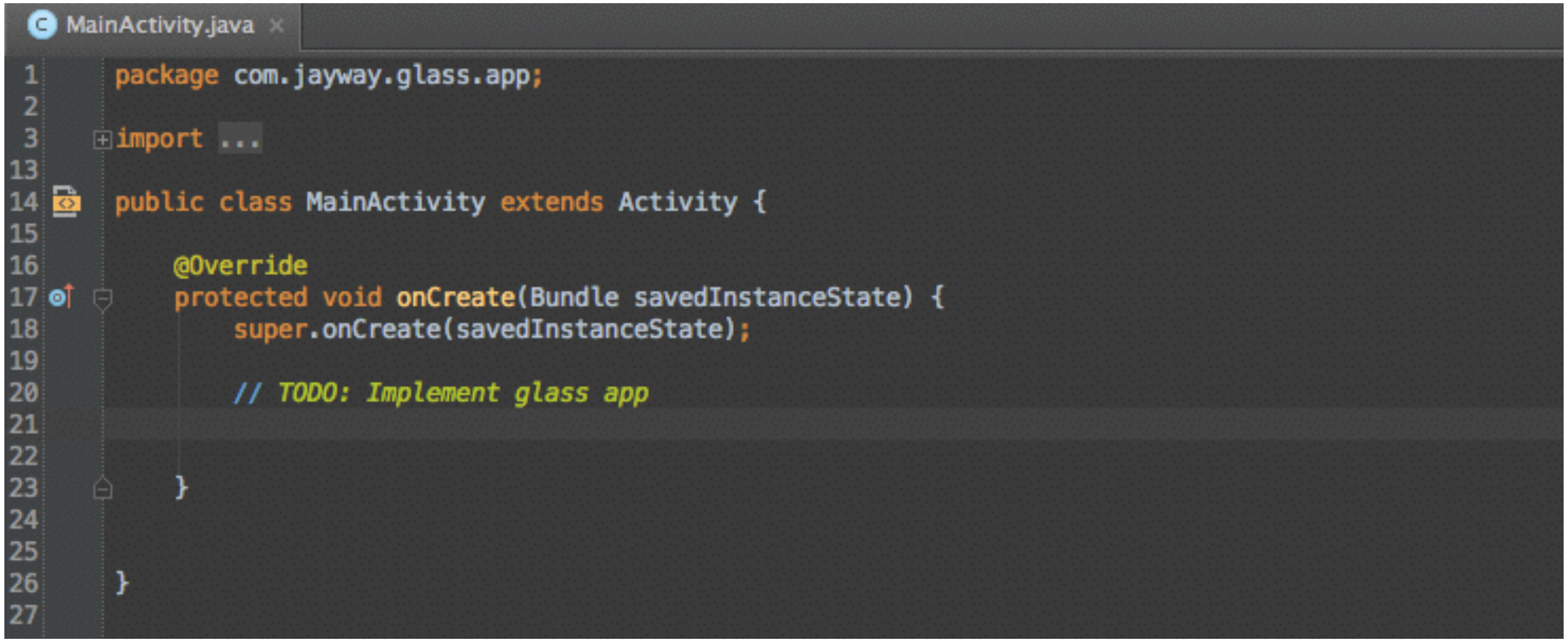
	Name	API	Rev.	Status
□	▶ Tools			
□	▶ Android 4.4.2 (API 19)			
□	▶ Android 4.3 (API 18)			
□	▶ Android 4.2.2 (API 17)			
□	▶ Android 4.1.2 (API 16)			
□	▼ Android 4.0.3 (API 15)			
□	SDK Platform	15	3	Installed
□	Samples for SDK	15	2	Installed
□	ARM EABI v7a System Image	15	2	Installed
□	*Intel x86 Atom System Image*	*15*	*1*	□ *Not installed*
□	MIPS System Image	15	1	Installed
□	Google APIs	15	2	Installed
☑	Glass Development Kit Sneak Peek	15	2	Installed
□	Sources for Android SDK	15	2	Installed
□	▶ Android 4.0 (API 14)			
□	▶ Android 3.2 (API 13)			
□	▶ Android 3.1 (API 12)			
□	▶ Android 3.0 (API 11)			
□	▶ Android 2.3.3 (API 10)			
□	▶ Android 2.2 (API 8)			
□	▶ Android 2.1 (API 7)			
□	▶ Android 1.6 (API 4)			
□	▶ Android 1.5 (API 3)			
□	▶ Extras			

Show: ☑ Updates/New ☑ Installed □ Obsolete Select New or Updates

Sort by: ● API level ○ Repository Deselect All

Done loading packages.

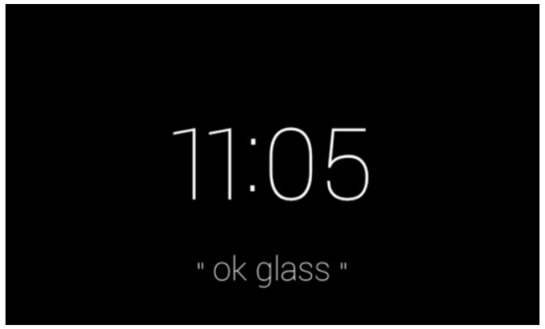
Create project



```java
package com.jayway.glass.app;

import ...

public class MainActivity extends Activity {

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

        // TODO: Implement glass app


    }


}

```

Starting Application

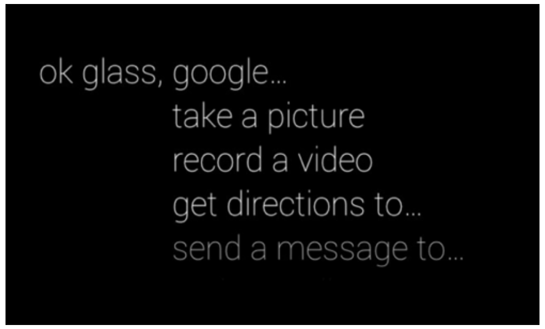
Starting Application



11:05

" ok glass "

“Ok Glass”



ok glass, google...
take a picture
record a video
get directions to...
send a message to...

“beer time”

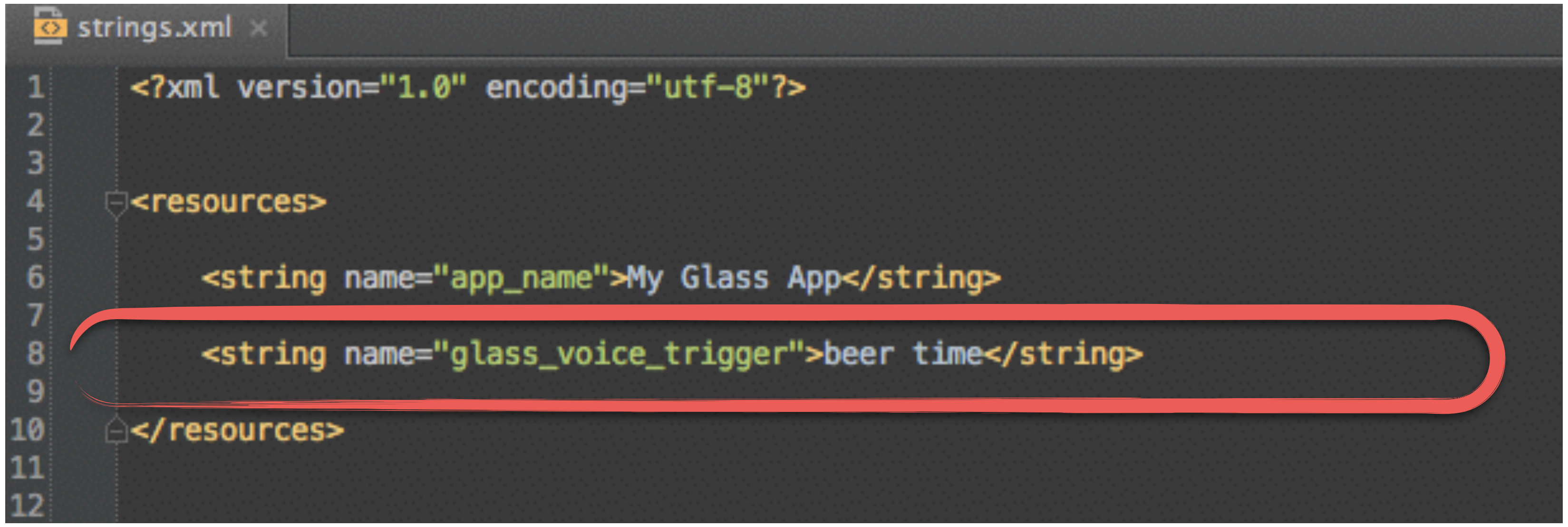
Starting Application

strings.xml

trigger

Manifest

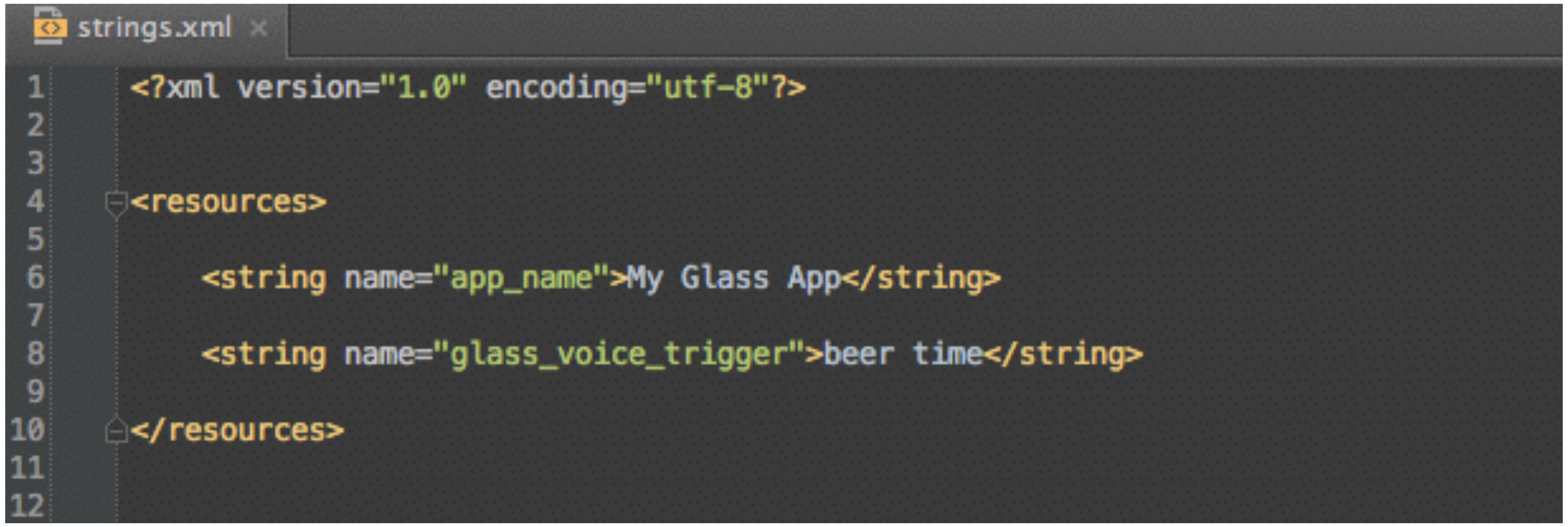
Starting Application



strings.xml

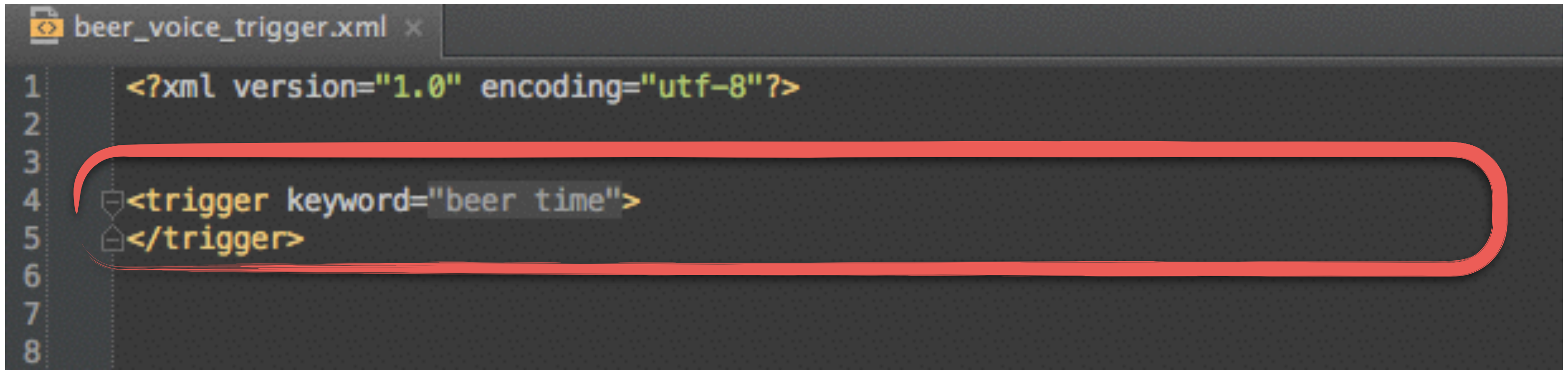
```
<?xml version="1.0" encoding="utf-8"?>


<resources>

    <string name="app_name">My Glass App</string>

    <string name="glass_voice_trigger">beer time</string>

</resources>
```

Starting Application



strings.xml

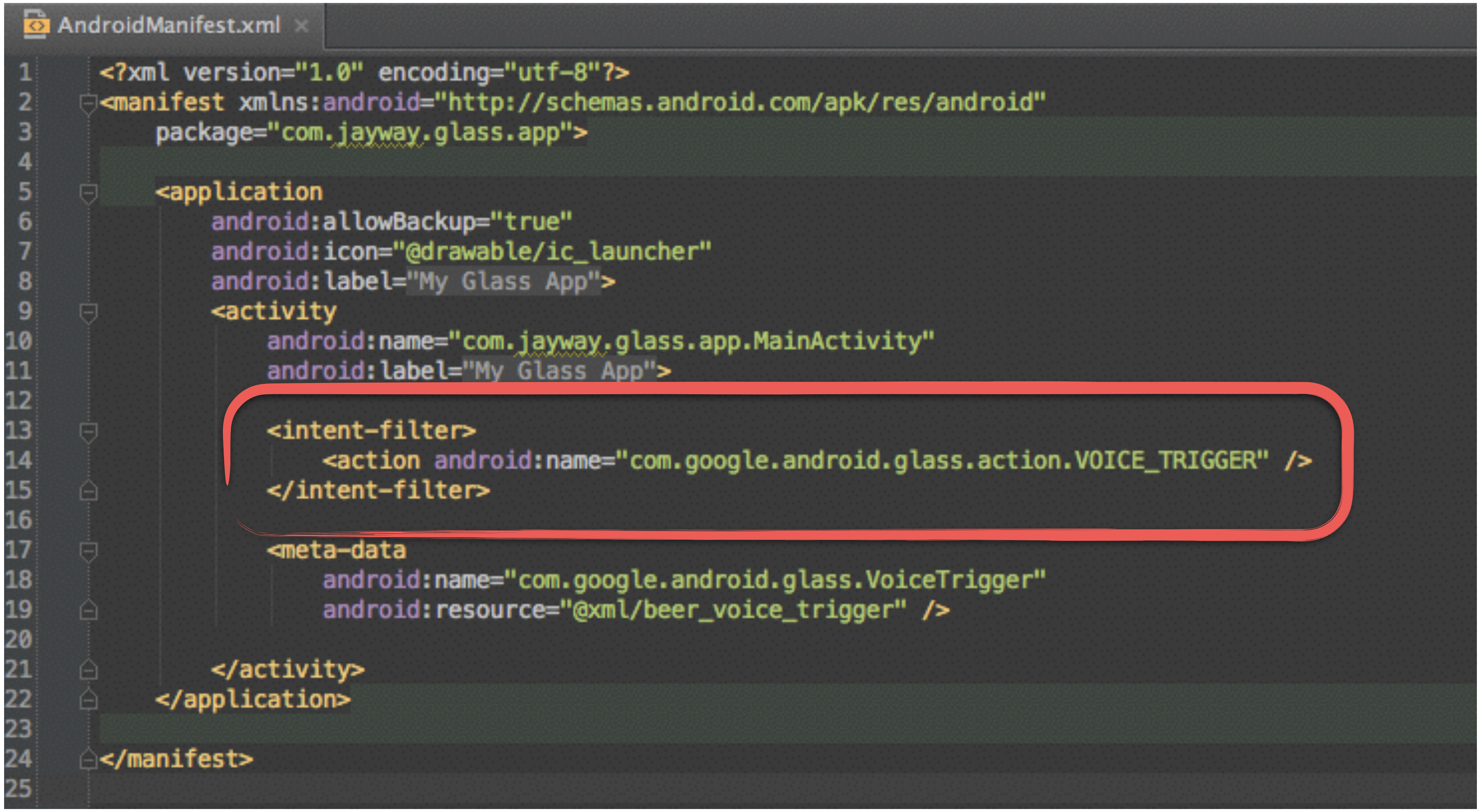
```xml
<?xml version="1.0" encoding="utf-8"?>


<resources>

    <string name="app_name">My Glass App</string>

    <string name="glass_voice_trigger">beer time</string>

</resources>
```



beer_voice_trigger.xml

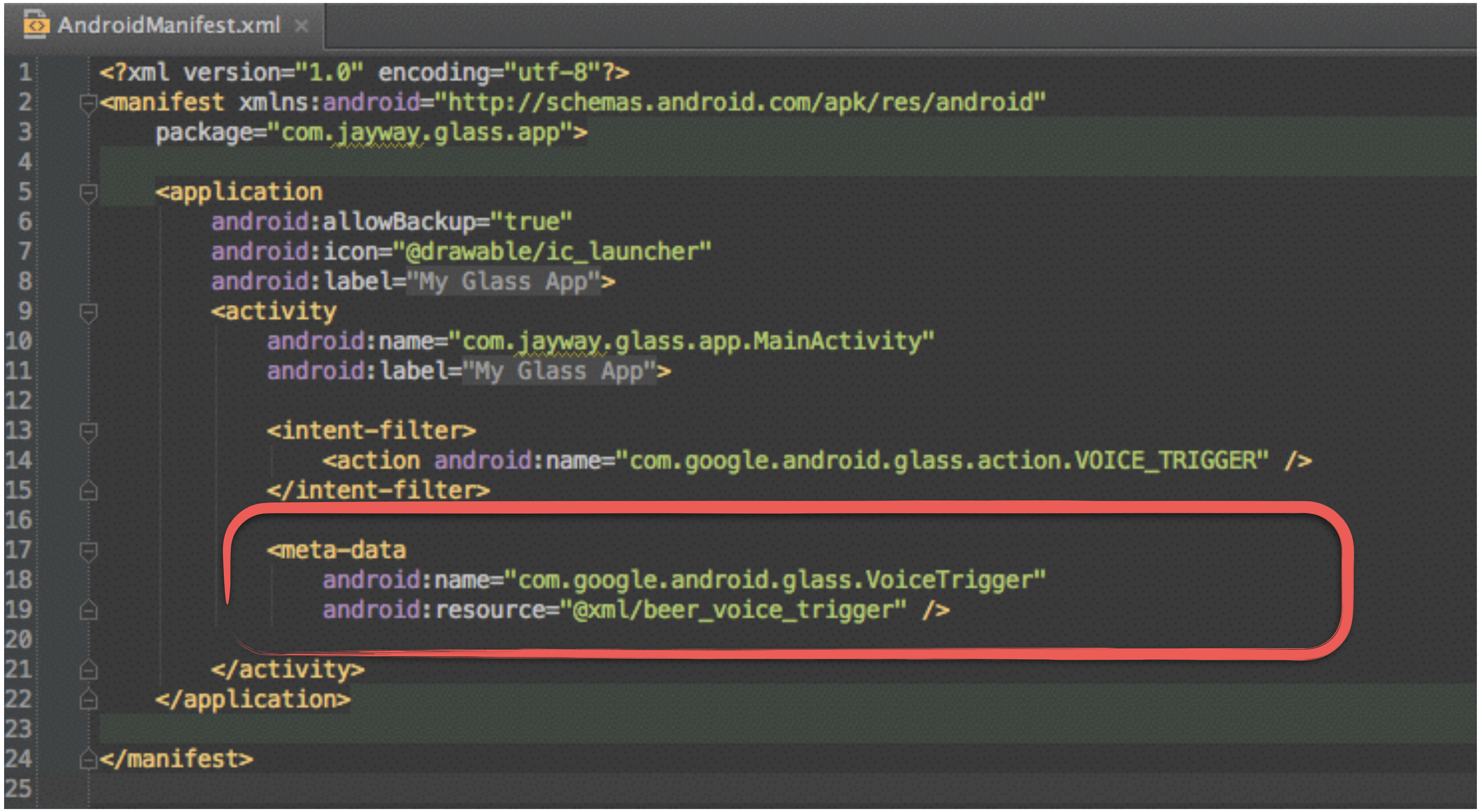
```xml
<?xml version="1.0" encoding="utf-8"?>


<trigger keyword="beer time">
</trigger>
```

Starting Application



```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.jayway.glass.app">

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="My Glass App">
        <activity
            android:name="com.jayway.glass.app.MainActivity"
            android:label="My Glass App">

            <intent-filter>
                <action android:name="com.google.android.glass.action.VOICE_TRIGGER" />
            </intent-filter>

            <meta-data
                android:name="com.google.android.glass.VoiceTrigger"
                android:resource="@xml/beer_voice_trigger" />

        </activity>
    </application>

</manifest>

```

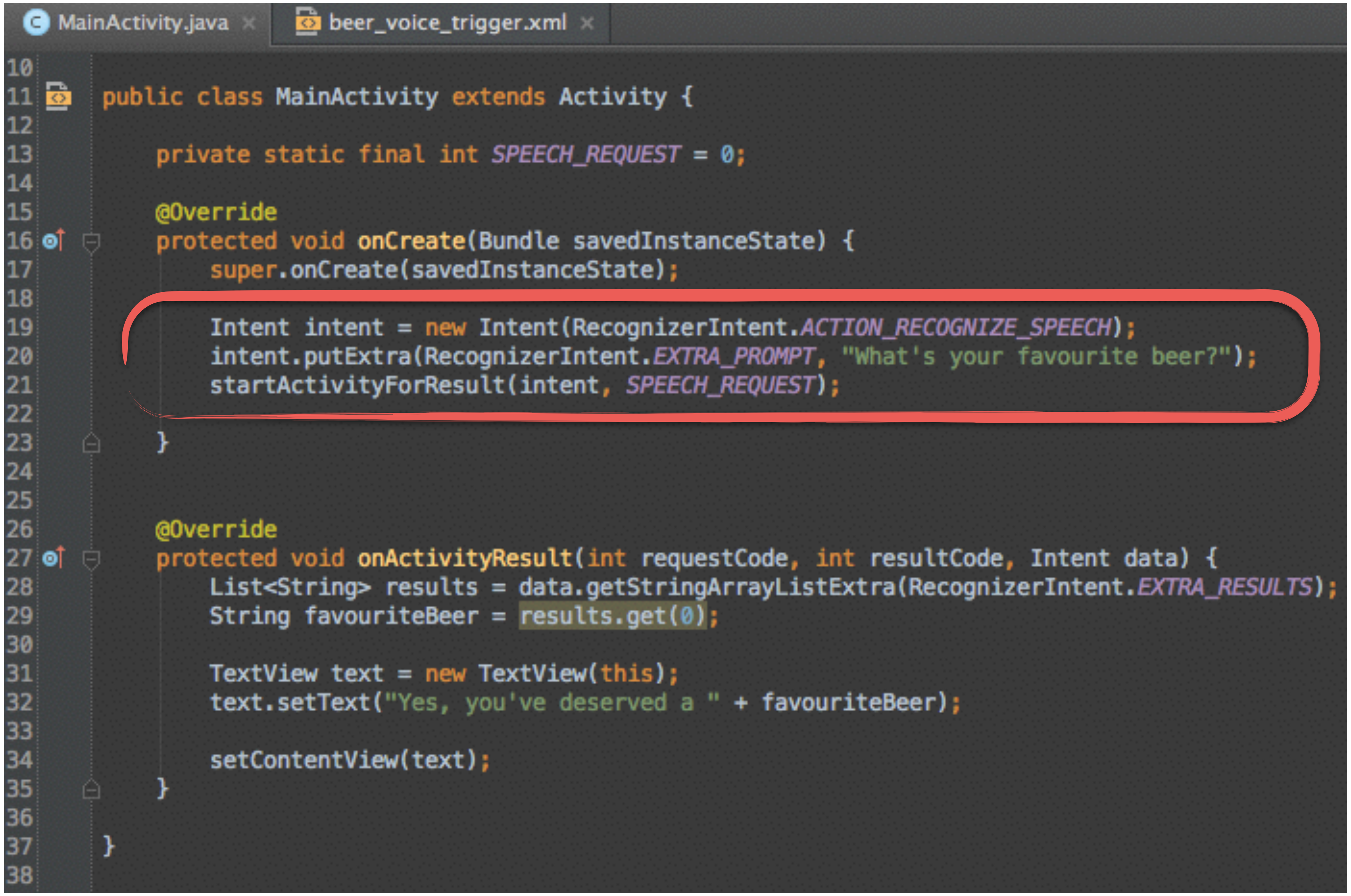
Starting Application



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.jayway.glass.app">

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="My Glass App">
        <activity
            android:name="com.jayway.glass.app.MainActivity"
            android:label="My Glass App">

            <intent-filter>
                <action android:name="com.google.android.glass.action.VOICE_TRIGGER" />
            </intent-filter>

            <meta-data
                android:name="com.google.android.glass.VoiceTrigger"
                android:resource="@xml/beer_voice_trigger" />

        </activity>
    </application>

</manifest>
```

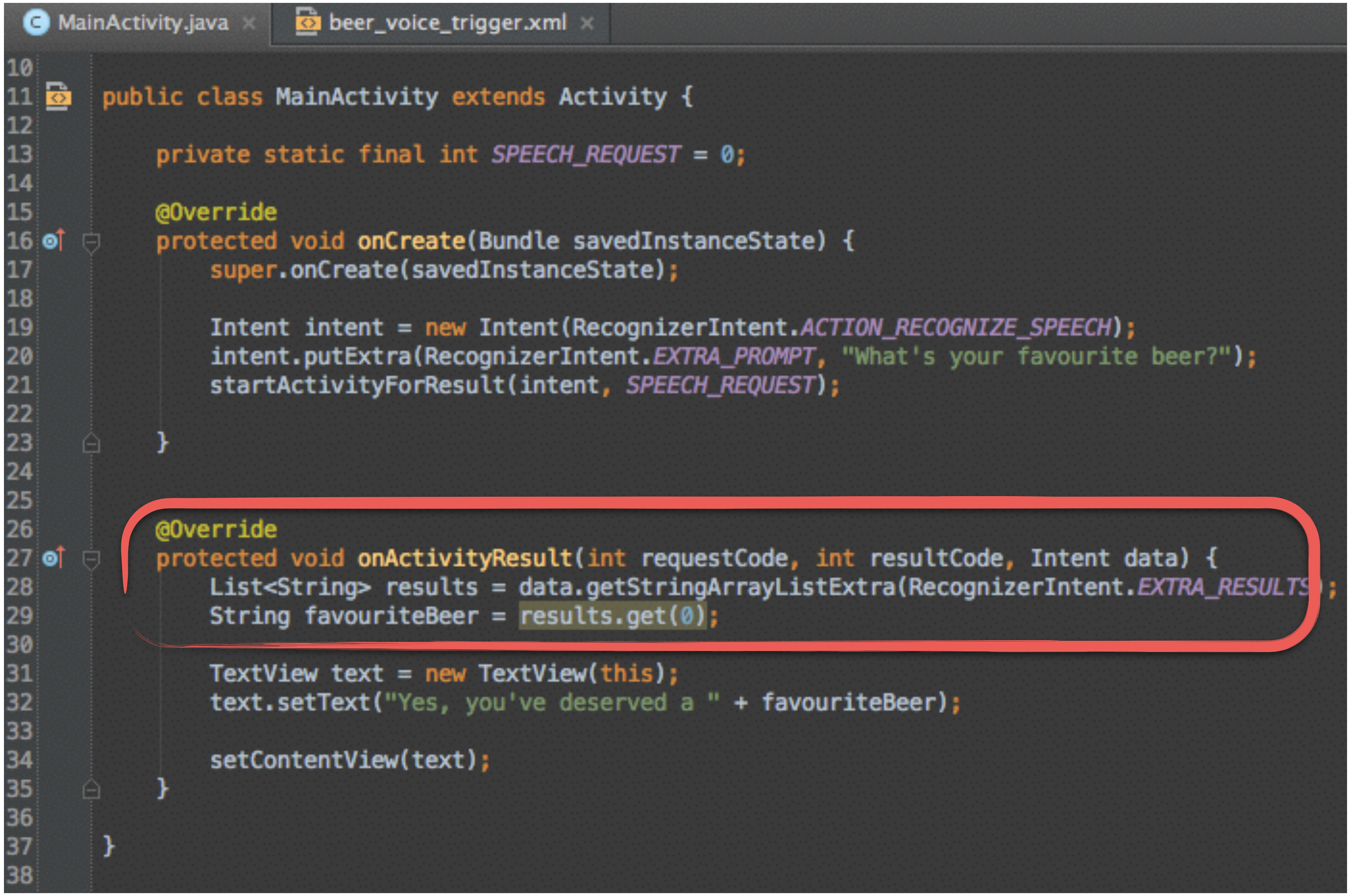
Speech Recognition

Speech Recognition



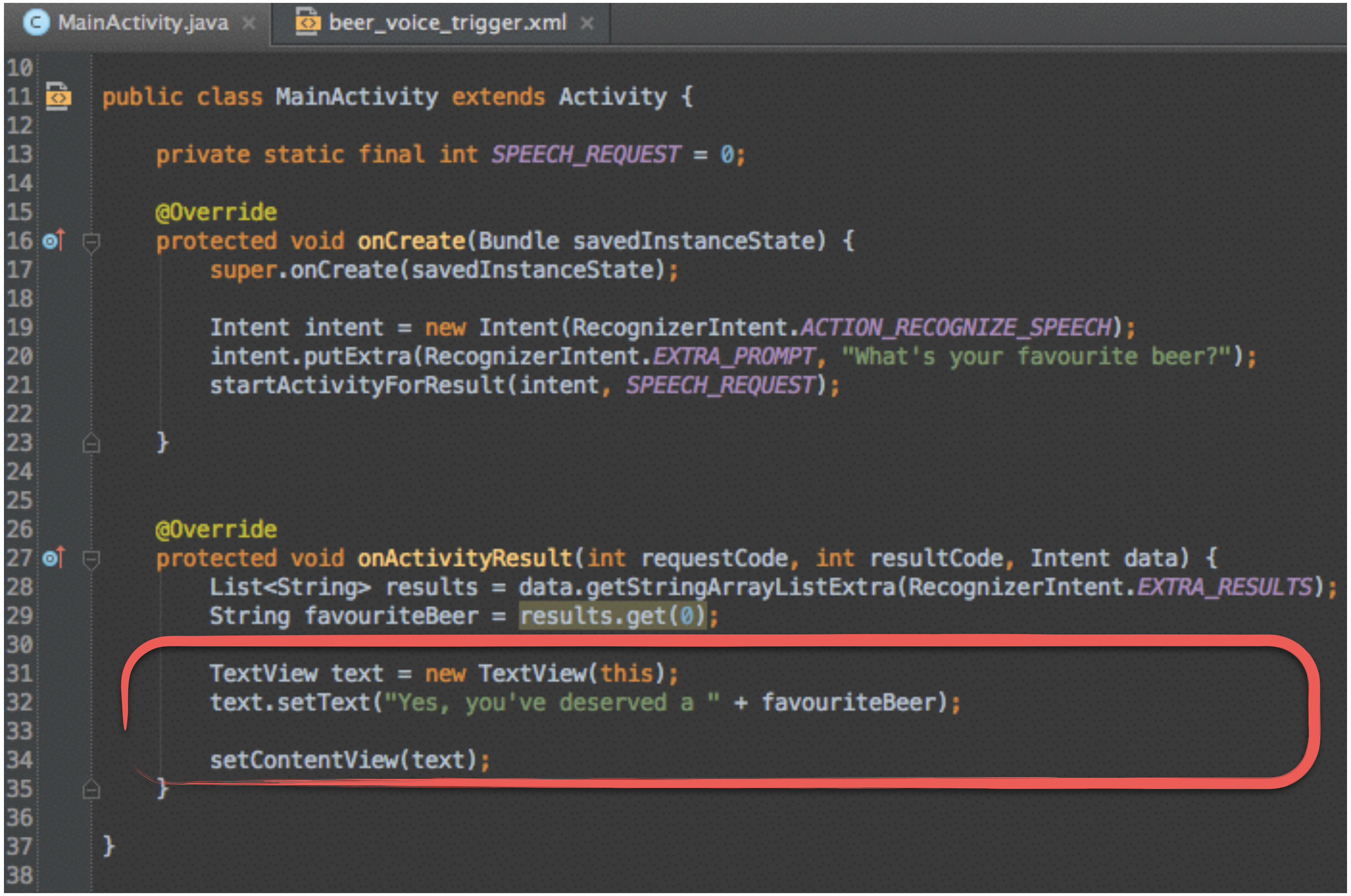
```java
public class MainActivity extends Activity {

    private static final int SPEECH_REQUEST = 0;

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

        Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
        intent.putExtra(RecognizerIntent.EXTRA_PROMPT, "What's your favourite beer?");
        startActivityForResult(intent, SPEECH_REQUEST);

    }


    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        List<String> results = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
        String favouriteBeer = results.get(0);

        TextView text = new TextView(this);
        text.setText("Yes, you've deserved a " + favouriteBeer);

        setContentView(text);
    }

}
```

Speech Recognition



```java

public class MainActivity extends Activity {

    private static final int SPEECH_REQUEST = 0;

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

        Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
        intent.putExtra(RecognizerIntent.EXTRA_PROMPT, "What's your favourite beer?");
        startActivityForResult(intent, SPEECH_REQUEST);

    }


    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        List<String> results = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
        String favouriteBeer = results.get(0);

        TextView text = new TextView(this);
        text.setText("Yes, you've deserved a " + favouriteBeer);

        setContentView(text);
    }

}

```

Speech Recognition

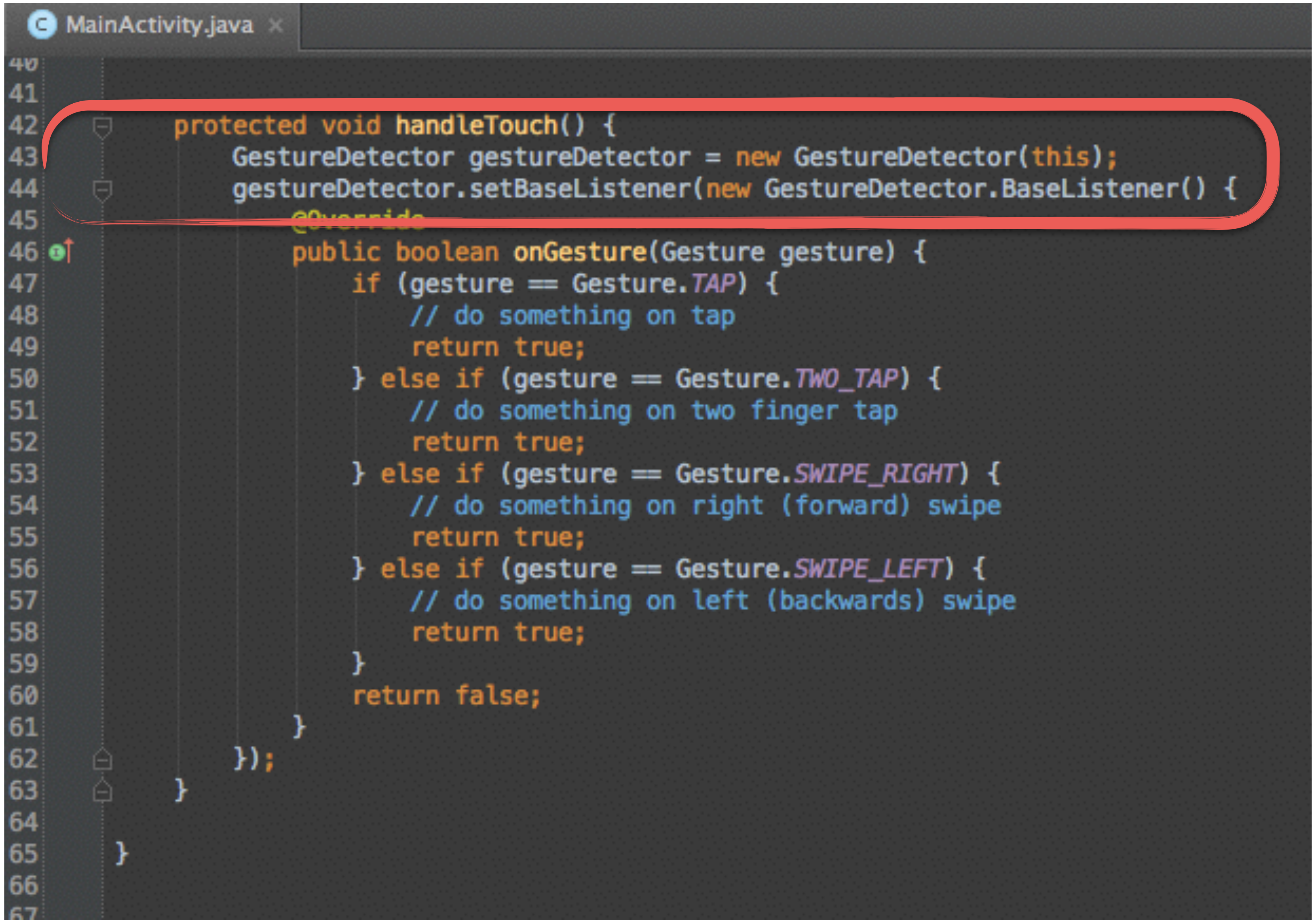


```java

public class MainActivity extends Activity {

    private static final int SPEECH_REQUEST = 0;

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

        Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
        intent.putExtra(RecognizerIntent.EXTRA_PROMPT, "What's your favourite beer?");
        startActivityForResult(intent, SPEECH_REQUEST);

    }


    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        List<String> results = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
        String favouriteBeer = results.get(0);

        TextView text = new TextView(this);
        text.setText("Yes, you've deserved a " + favouriteBeer);

        setContentView(text);
    }

}

```

Demo

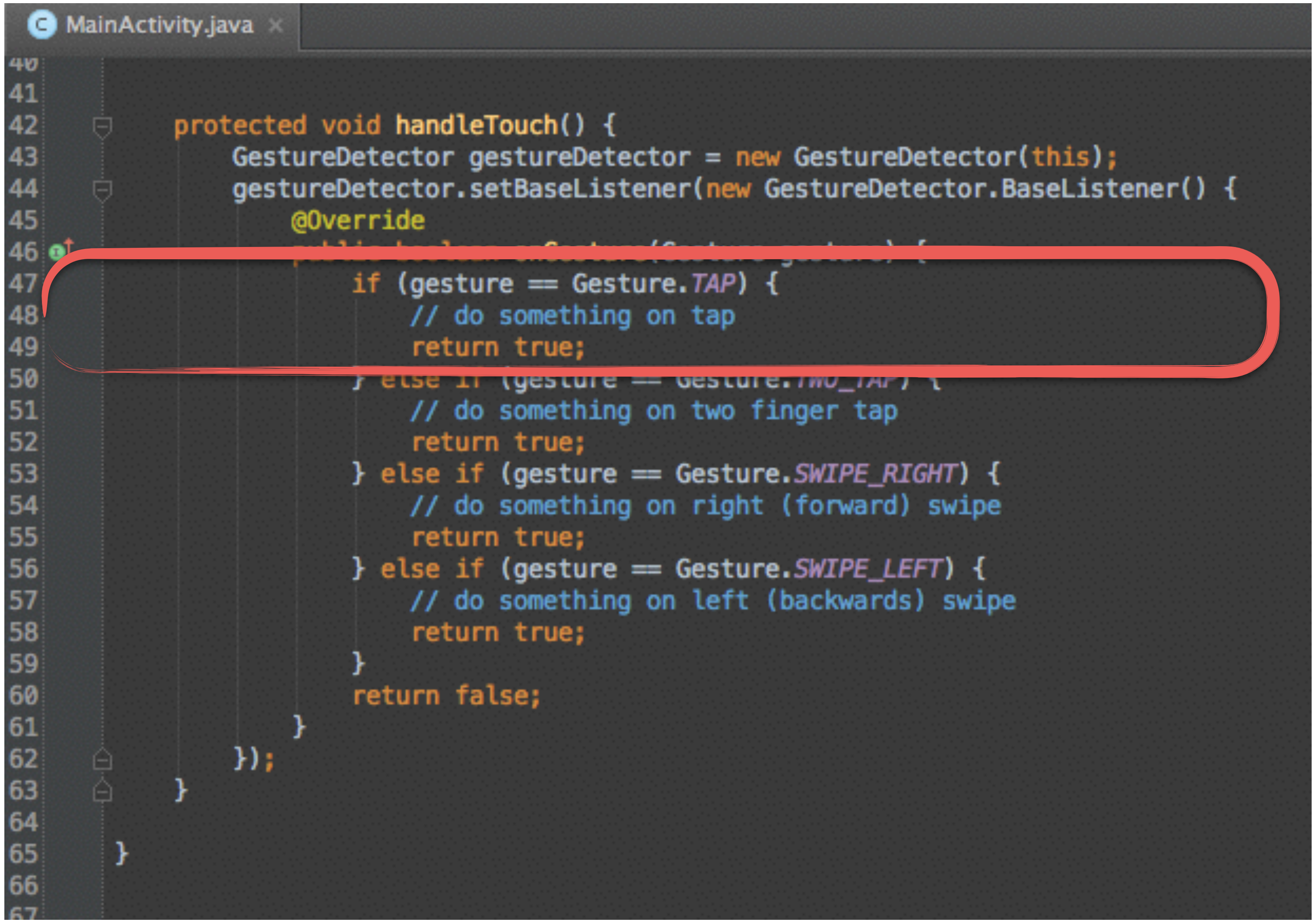
Touch Gestures

Touch Gestures



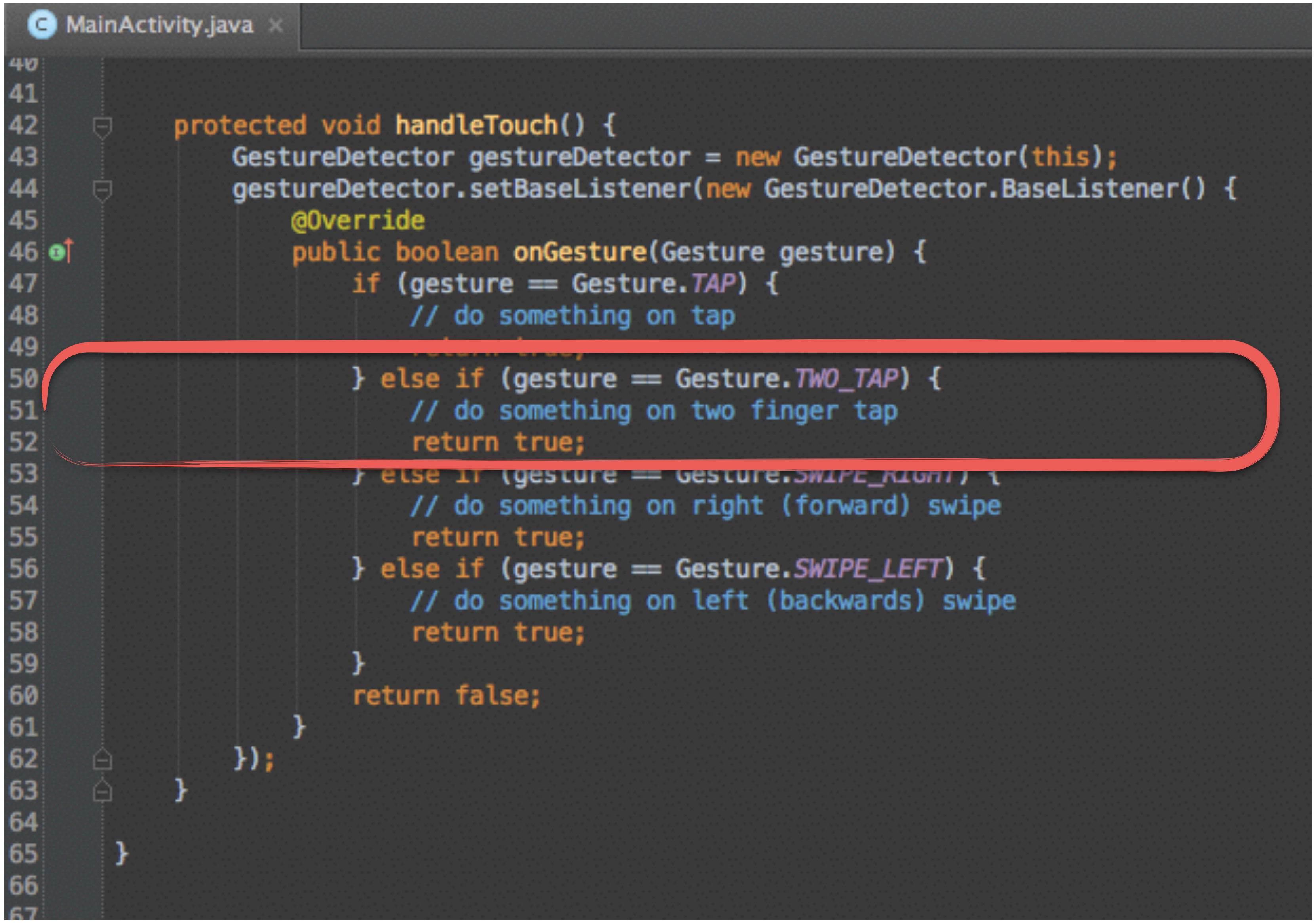
```
    protected void handleTouch() {
        GestureDetector gestureDetector = new GestureDetector(this);
        gestureDetector.setBaseListener(new GestureDetector.BaseListener() {
            @Override
            public boolean onGesture(Gesture gesture) {
                if (gesture == Gesture.TAP) {
                    // do something on tap
                    return true;
                } else if (gesture == Gesture.TWO_TAP) {
                    // do something on two finger tap
                    return true;
                } else if (gesture == Gesture.SWIPE_RIGHT) {
                    // do something on right (forward) swipe
                    return true;
                } else if (gesture == Gesture.SWIPE_LEFT) {
                    // do something on left (backwards) swipe
                    return true;
                }
                return false;
            }
        });
    }

}
```

Touch Gestures



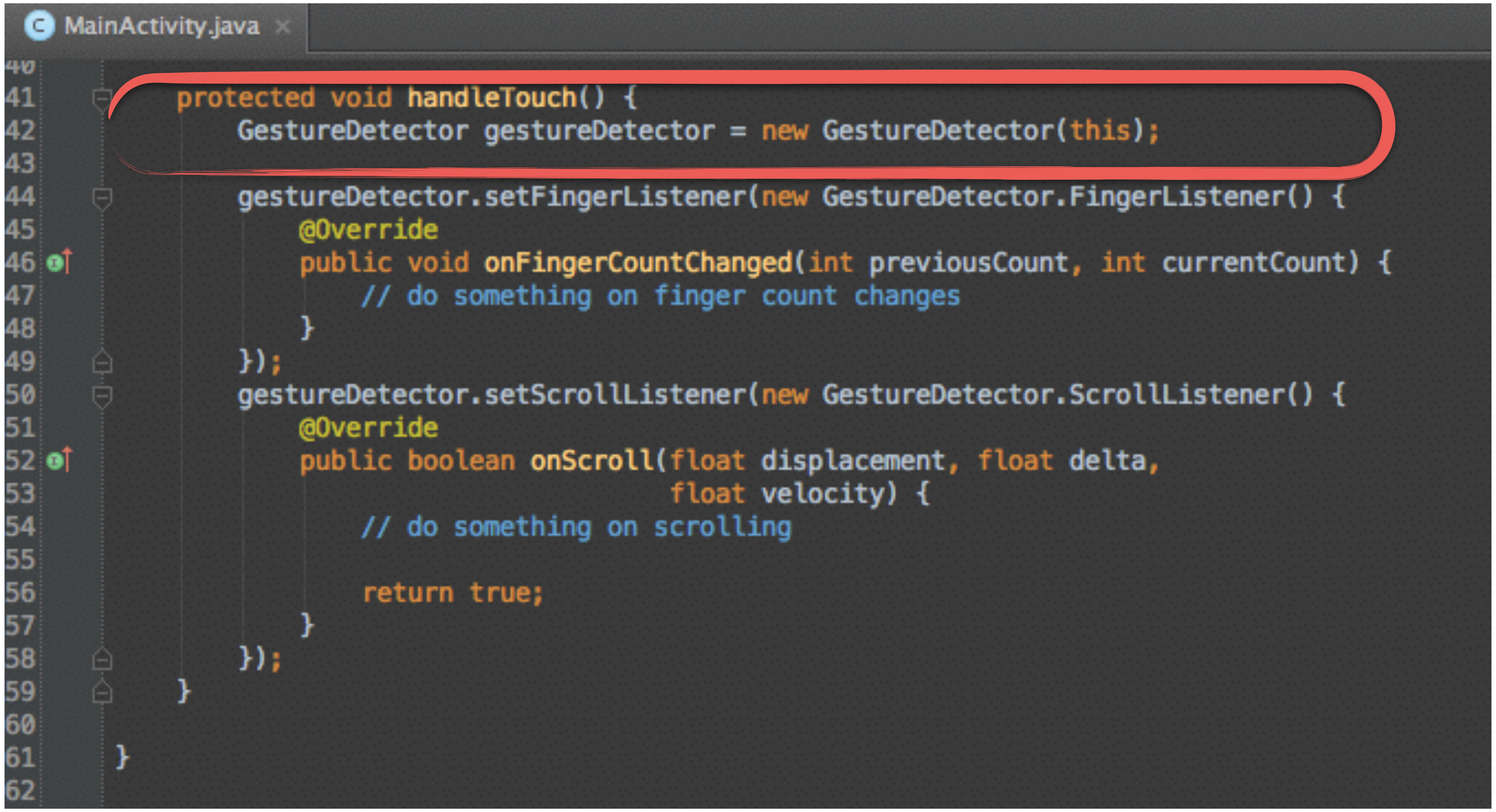
```java

    protected void handleTouch() {
        GestureDetector gestureDetector = new GestureDetector(this);
        gestureDetector.setBaseListener(new GestureDetector.BaseListener() {
            @Override
            public boolean onGesture(Gesture gesture) {
                if (gesture == Gesture.TAP) {
                    // do something on tap
                    return true;
                } else if (gesture == Gesture.TWO_TAP) {
                    // do something on two finger tap
                    return true;
                } else if (gesture == Gesture.SWIPE_RIGHT) {
                    // do something on right (forward) swipe
                    return true;
                } else if (gesture == Gesture.SWIPE_LEFT) {
                    // do something on left (backwards) swipe
                    return true;
                }
                return false;
            }
        });
    }

}

```

Touch Gestures



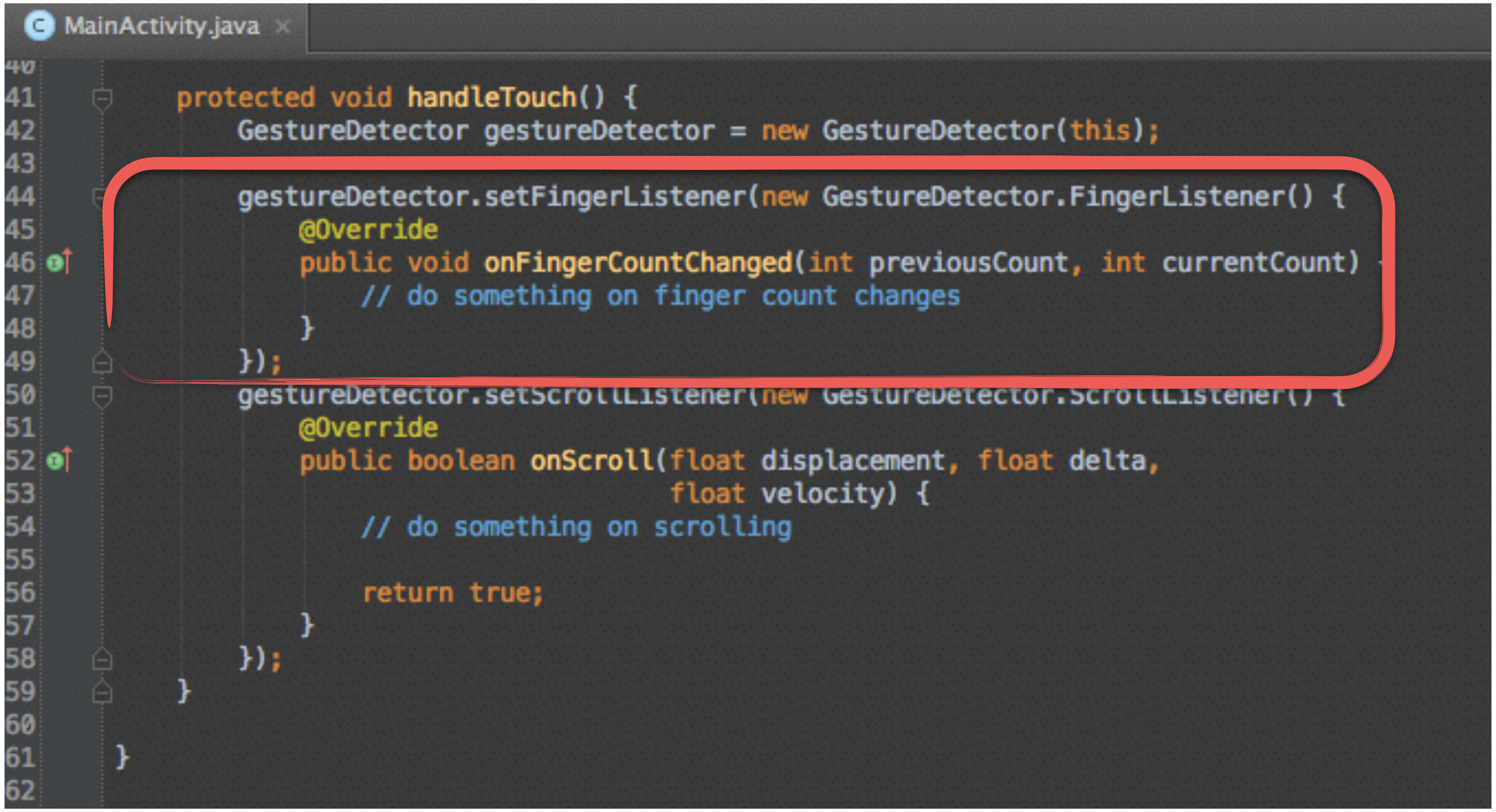
```
        protected void handleTouch() {
            GestureDetector gestureDetector = new GestureDetector(this);
            gestureDetector.setBaseListener(new GestureDetector.BaseListener() {
                @Override
                public boolean onGesture(Gesture gesture) {
                    if (gesture == Gesture.TAP) {
                        // do something on tap
                        return true;
                    } else if (gesture == Gesture.TWO_TAP) {
                        // do something on two finger tap
                        return true;
                    } else if (gesture == Gesture.SWIPE_RIGHT) {
                        // do something on right (forward) swipe
                        return true;
                    } else if (gesture == Gesture.SWIPE_LEFT) {
                        // do something on left (backwards) swipe
                        return true;
                    }
                    return false;
                }
            });
        }

    }
```

Touch Gestures



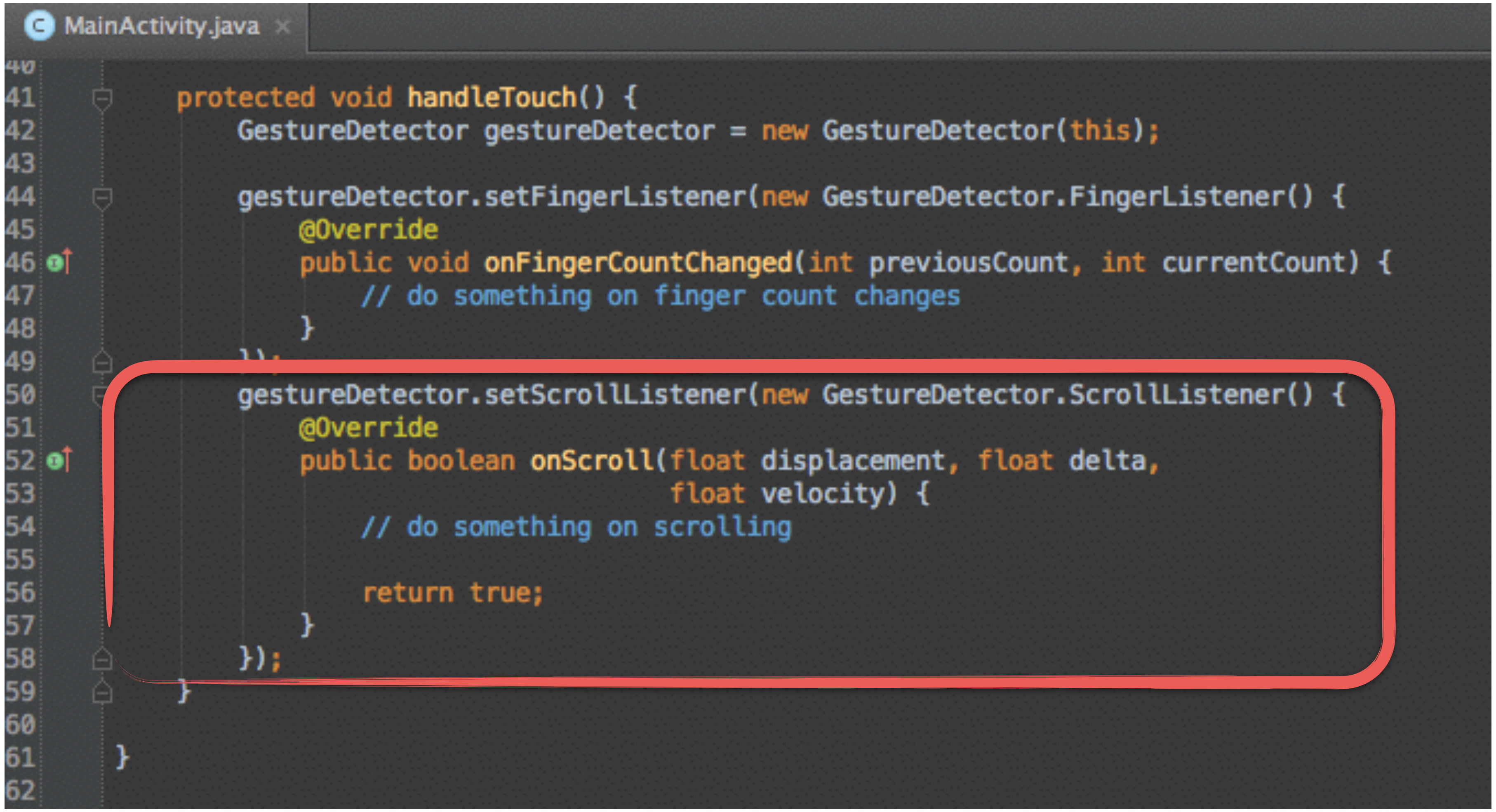
```java
    protected void handleTouch() {
        GestureDetector gestureDetector = new GestureDetector(this);

        gestureDetector.setFingerListener(new GestureDetector.FingerListener() {
            @Override
            public void onFingerCountChanged(int previousCount, int currentCount) {
                // do something on finger count changes
            }
        });
        gestureDetector.setScrollListener(new GestureDetector.ScrollListener() {
            @Override
            public boolean onScroll(float displacement, float delta,
                                    float velocity) {
                // do something on scrolling

                return true;
            }
        });
    }

}
```

Touch Gestures



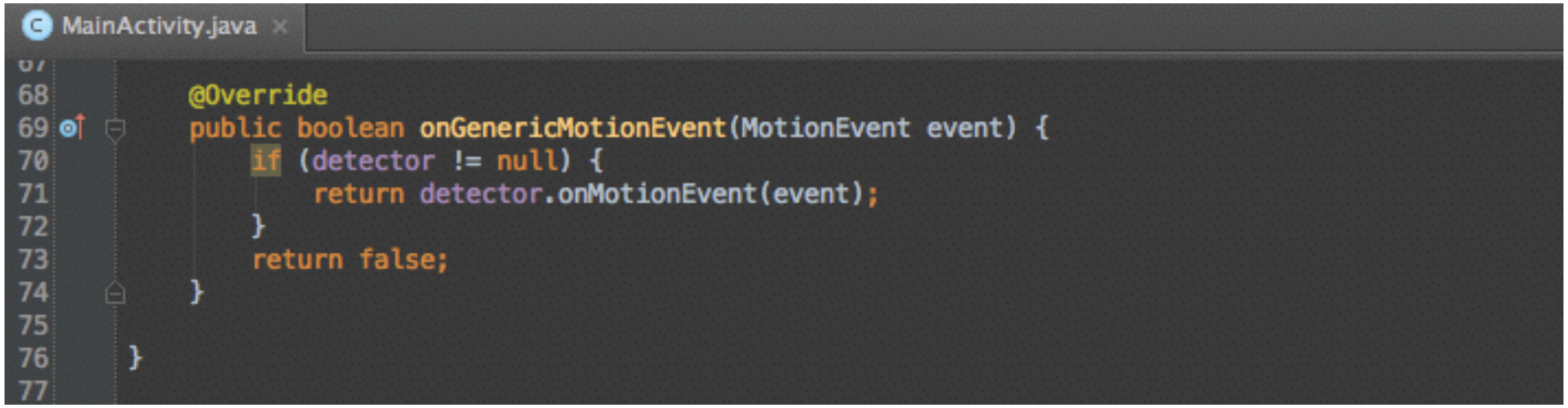
```
    protected void handleTouch() {
        GestureDetector gestureDetector = new GestureDetector(this);

        gestureDetector.setFingerListener(new GestureDetector.FingerListener() {
            @Override
            public void onFingerCountChanged(int previousCount, int currentCount)
                // do something on finger count changes
            }
        });
        gestureDetector.setScrollListener(new GestureDetector.ScrollListener() {
            @Override
            public boolean onScroll(float displacement, float delta,
                                    float velocity) {
                // do something on scrolling

                return true;
            }
        });
    }

}
```

Touch Gestures



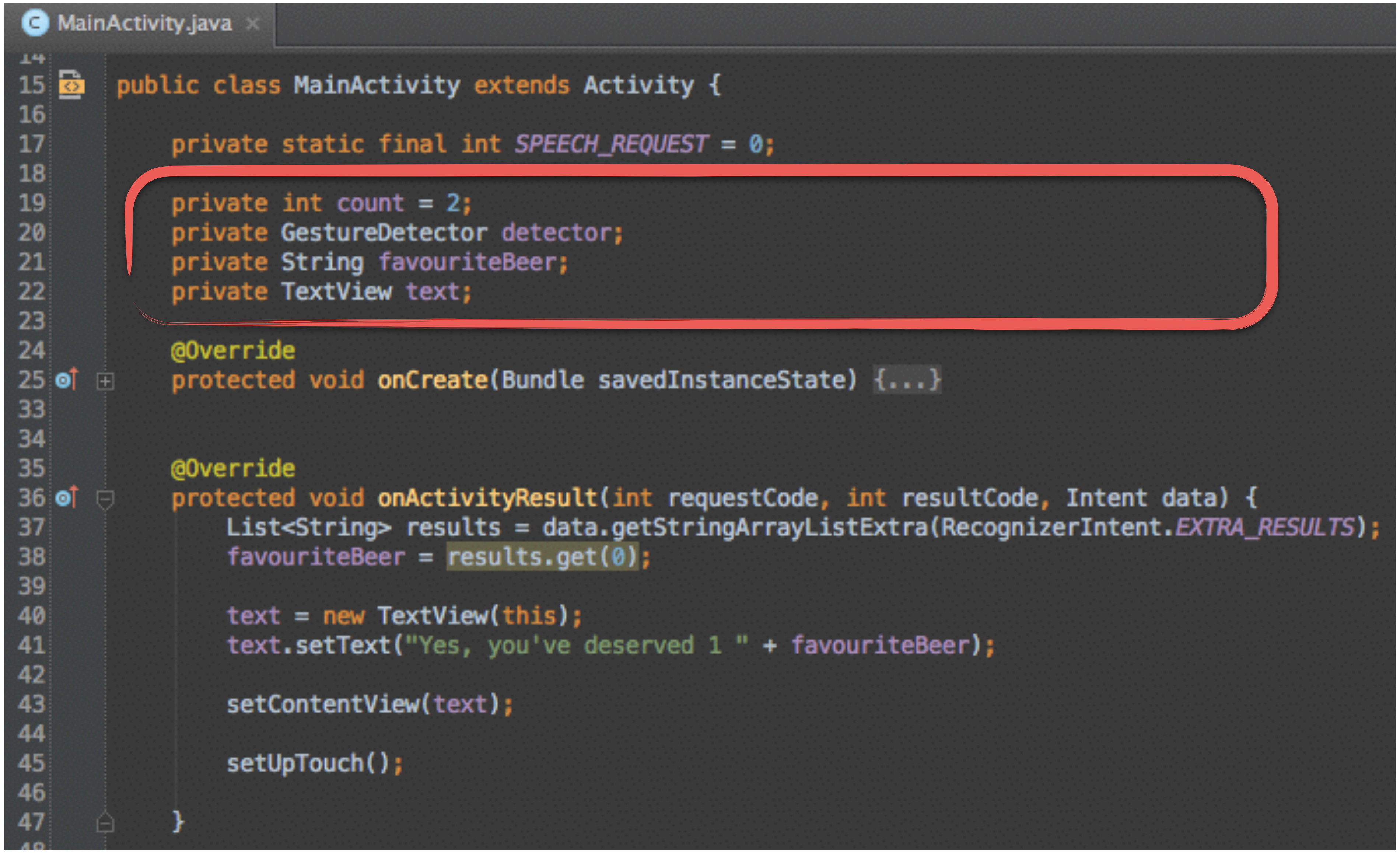
```java
    protected void handleTouch() {
        GestureDetector gestureDetector = new GestureDetector(this);

        gestureDetector.setFingerListener(new GestureDetector.FingerListener() {
            @Override
            public void onFingerCountChanged(int previousCount, int currentCount) {
                // do something on finger count changes
            }
        });
        gestureDetector.setScrollListener(new GestureDetector.ScrollListener() {
            @Override
            public boolean onScroll(float displacement, float delta,
                                    float velocity) {
                // do something on scrolling

                return true;
            }
        });
    }

}
```

Touch Gestures



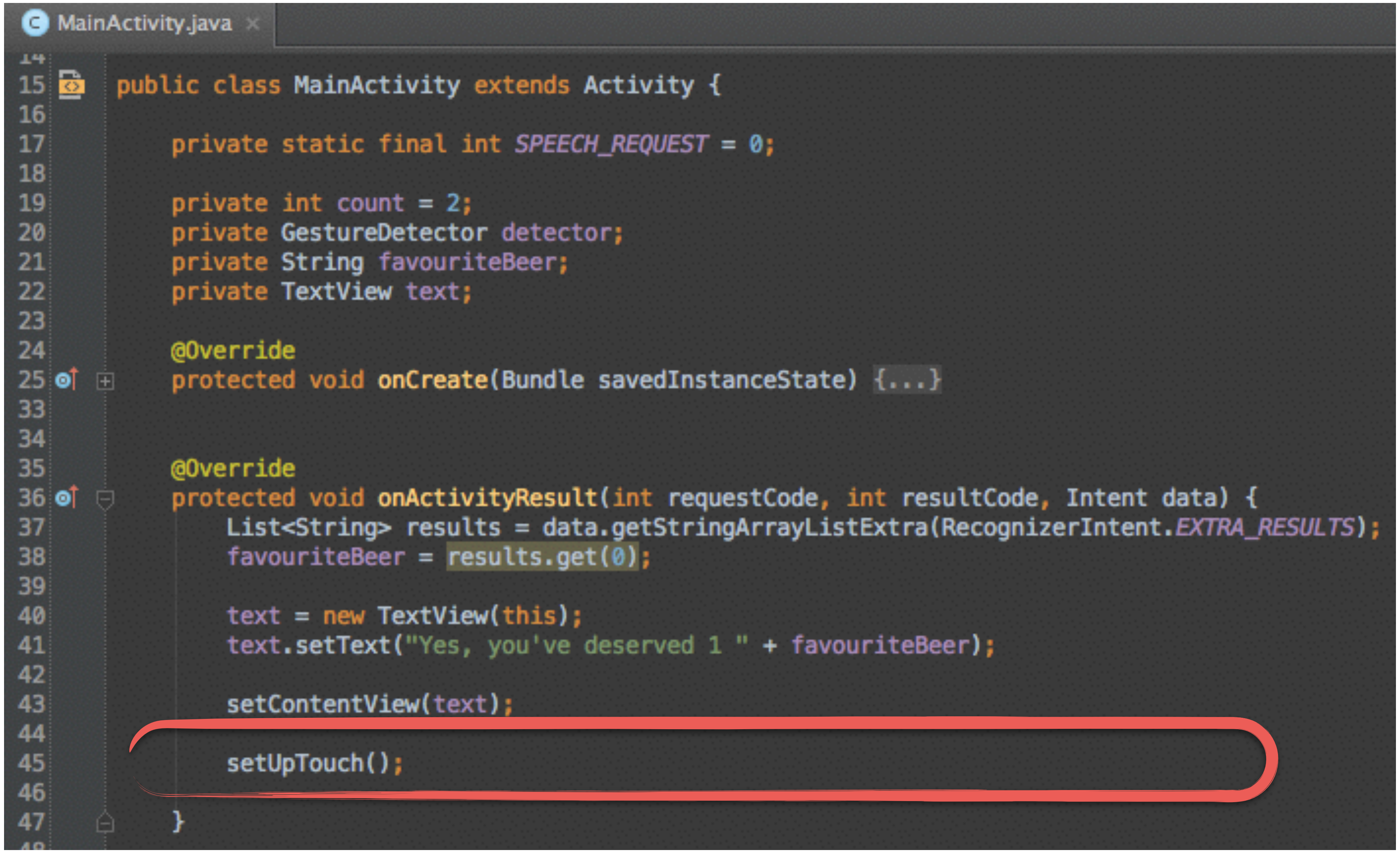
```java
    @Override
    public boolean onGenericMotionEvent(MotionEvent event) {
        if (detector != null) {
            return detector.onMotionEvent(event);
        }
        return false;
    }

}
```

Touch Gestures



```java
public class MainActivity extends Activity {

    private static final int SPEECH_REQUEST = 0;

    private int count = 2;
    private GestureDetector detector;
    private String favouriteBeer;
    private TextView text;

    @Override
    protected void onCreate(Bundle savedInstanceState) {...}


    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        List<String> results = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
        favouriteBeer = results.get(0);

        text = new TextView(this);
        text.setText("Yes, you've deserved 1 " + favouriteBeer);

        setContentView(text);

        setUpTouch();

    }
```

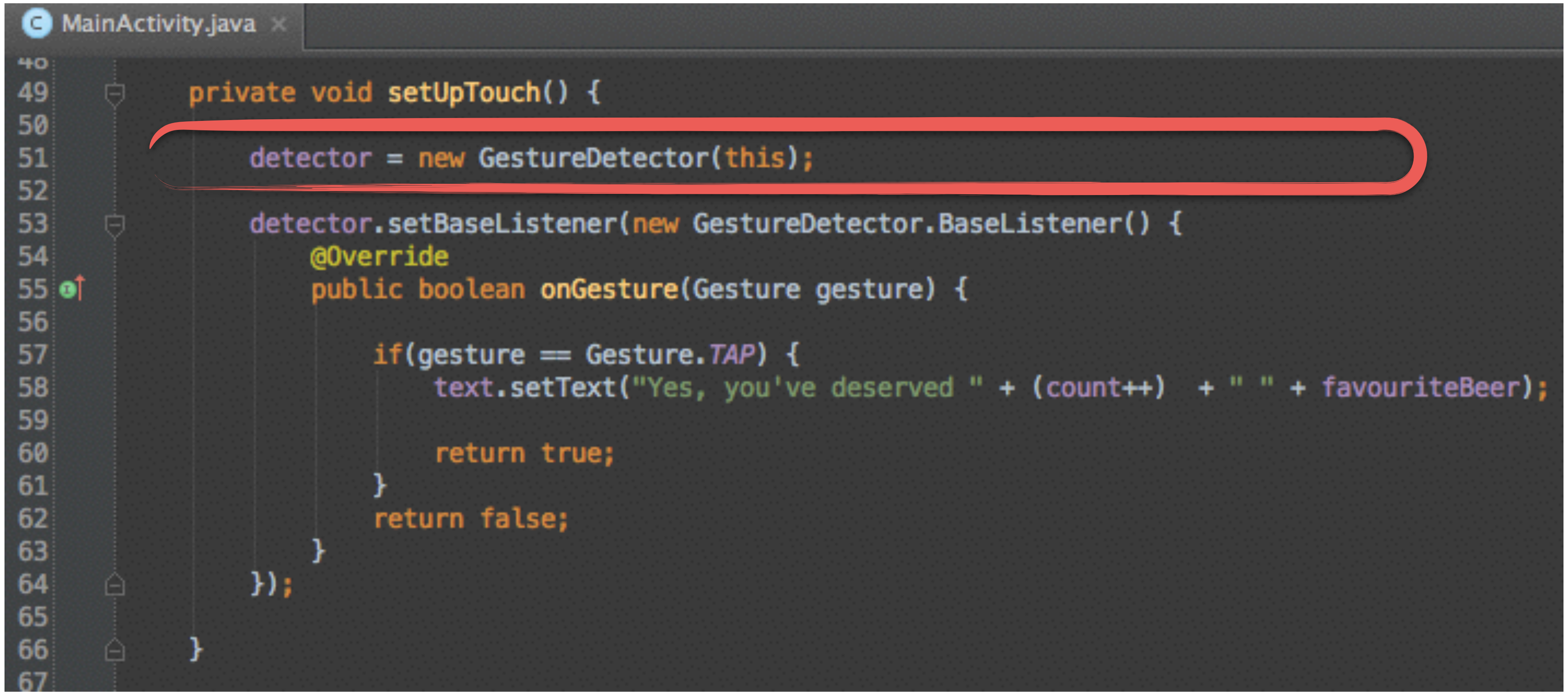
Touch Gestures



MainActivity.java

```java
public class MainActivity extends Activity {

    private static final int SPEECH_REQUEST = 0;

    private int count = 2;
    private GestureDetector detector;
    private String favouriteBeer;
    private TextView text;

    @Override
    protected void onCreate(Bundle savedInstanceState) {...}


    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        List<String> results = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
        favouriteBeer = results.get(0);

        text = new TextView(this);
        text.setText("Yes, you've deserved 1 " + favouriteBeer);

        setContentView(text);

        setUpTouch();

    }
```

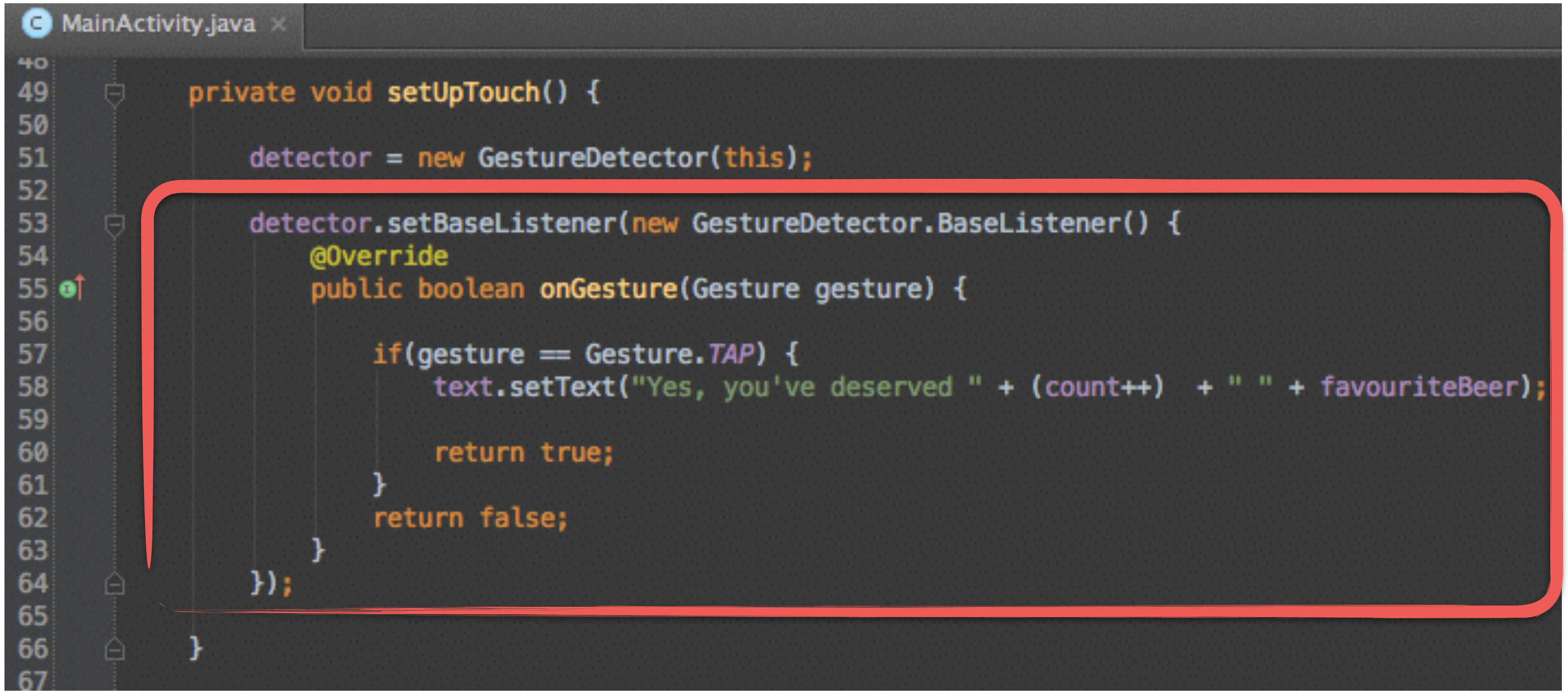
Touch Gestures



MainActivity.java

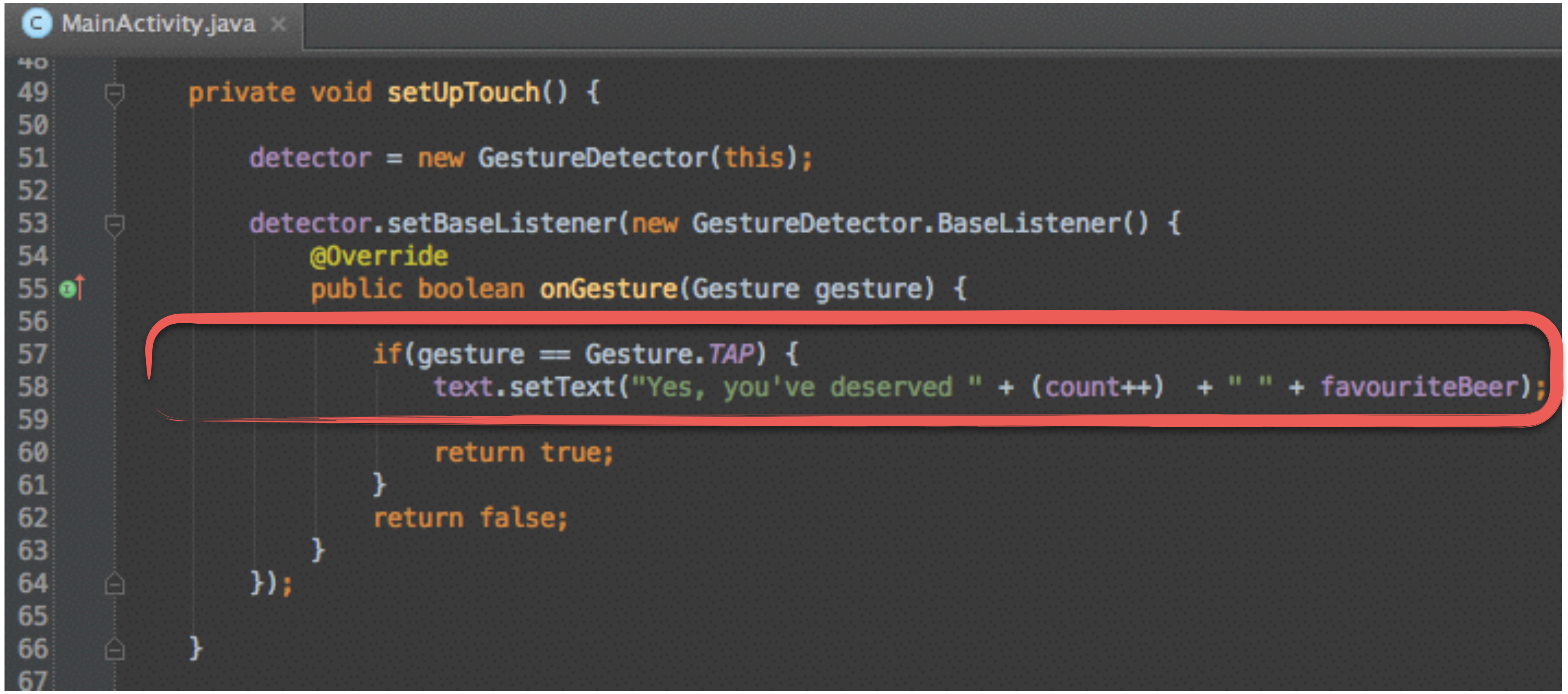
```java
private void setUpTouch() {

    detector = new GestureDetector(this);

    detector.setBaseListener(new GestureDetector.BaseListener() {
        @Override
        public boolean onGesture(Gesture gesture) {

            if(gesture == Gesture.TAP) {
                text.setText("Yes, you've deserved " + (count++)  + " " + favouriteBeer);

                return true;
            }
            return false;
        }
    });

}
```

Touch Gestures



```
    private void setUpTouch() {

        detector = new GestureDetector(this);

        detector.setBaseListener(new GestureDetector.BaseListener() {
            @Override
            public boolean onGesture(Gesture gesture) {

                if(gesture == Gesture.TAP) {
                    text.setText("Yes, you've deserved " + (count++)  + " " + favouriteBeer);

                    return true;
                }
                return false;
            }
        });

    }
```

Touch Gestures



```java
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        detector = new GestureDetector(this);

        detector.setBaseListener(new GestureDetector.BaseListener() {
            @Override
            public boolean onGesture(Gesture gesture) {

                if(gesture == Gesture.TAP) {
                    text.setText("Yes, you've deserved " + (count++)  + " " + favouriteBeer);

                    return true;
                }
                return false;
            }
        });

    }
```
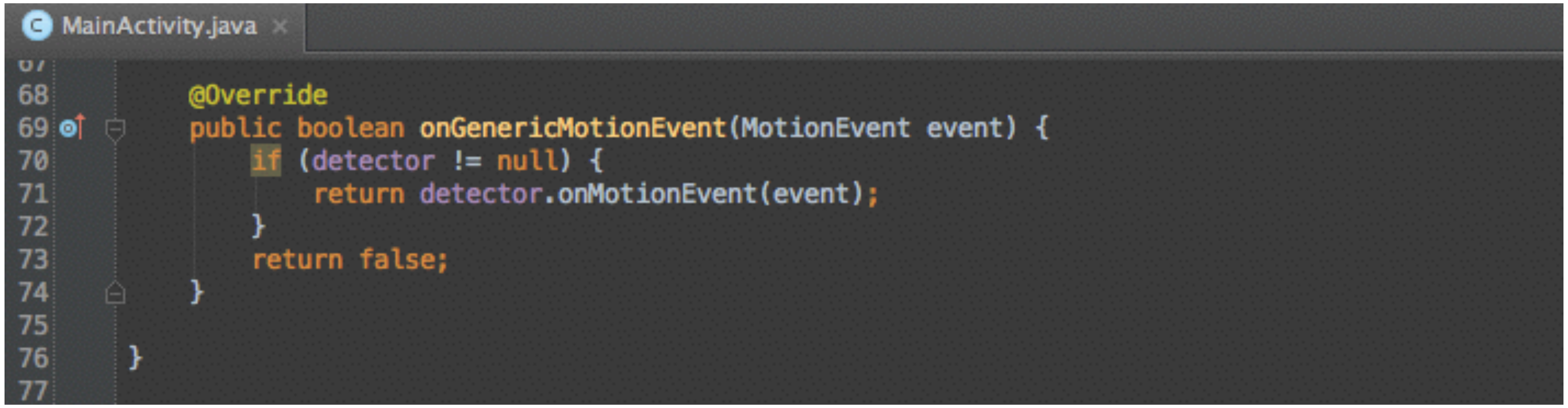

Touch Gestures



```
    @Override
    public boolean onGenericMotionEvent(MotionEvent event) {
        if (detector != null) {
            return detector.onMotionEvent(event);
        }
        return false;
    }

}
```

Demo

Convert existing apps

Convert existing apps

Voice

Convert existing apps

Voice

Navigation

Convert existing apps

Voice

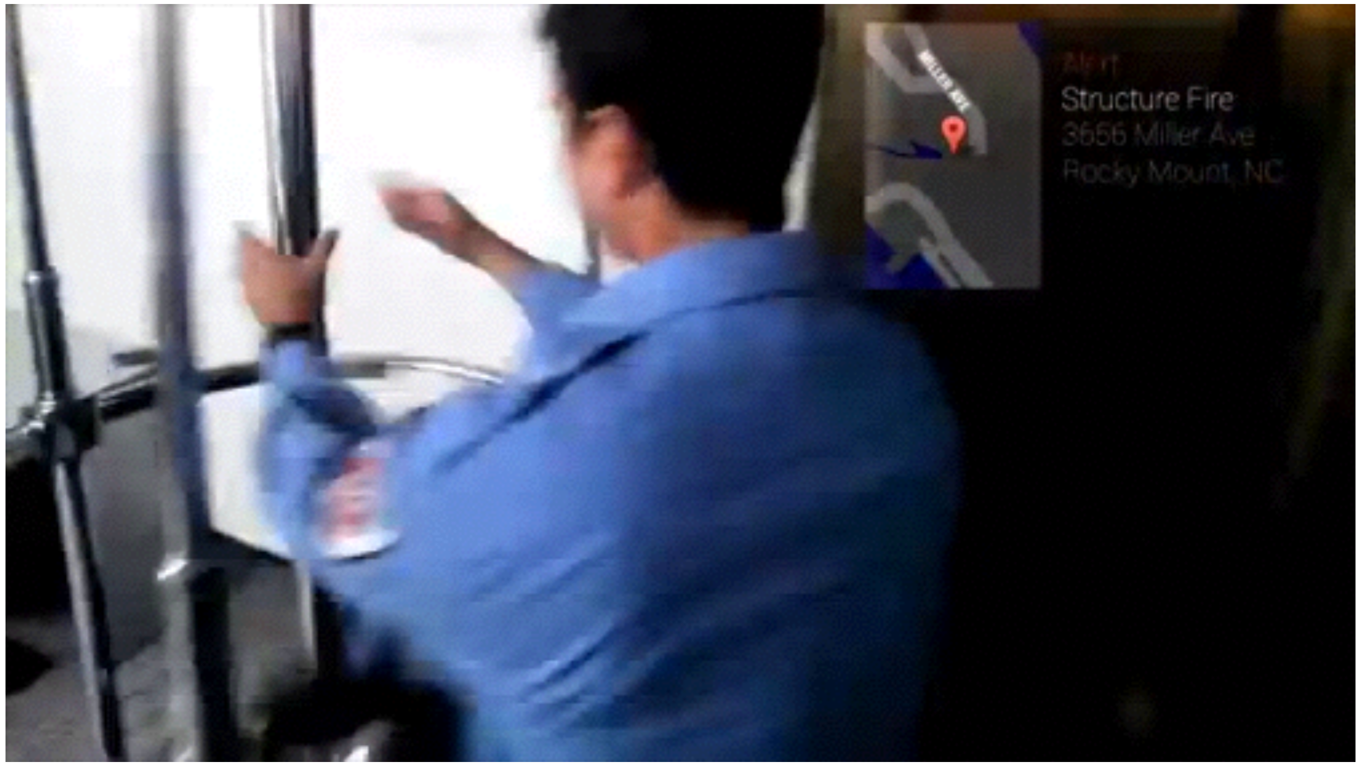
Navigation

UX

Part 3

Existing Apps

Firefighter



Alert

Structure Fire

3656 Miller Ave

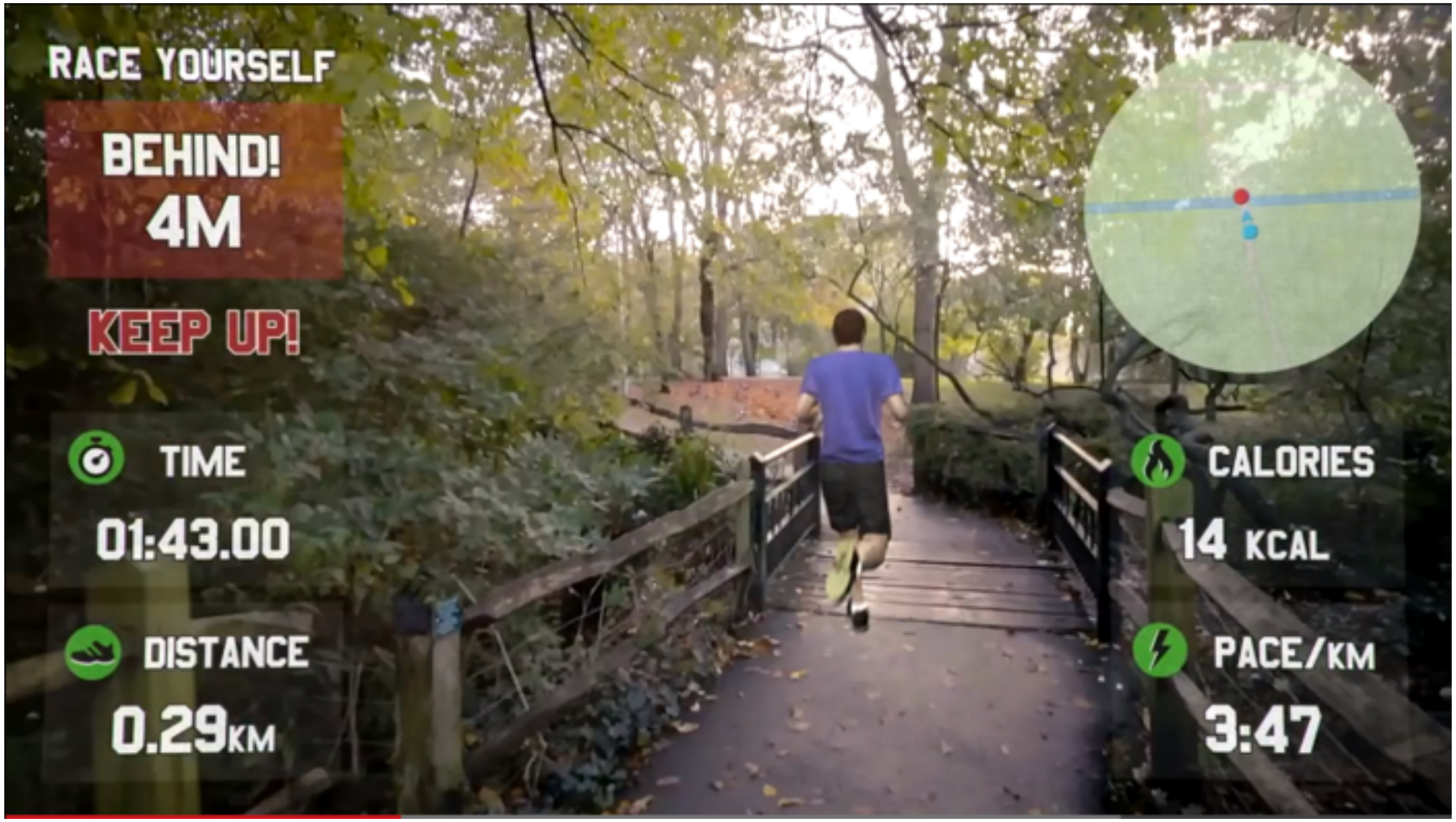
Rocky Mount, NC

Firefighter

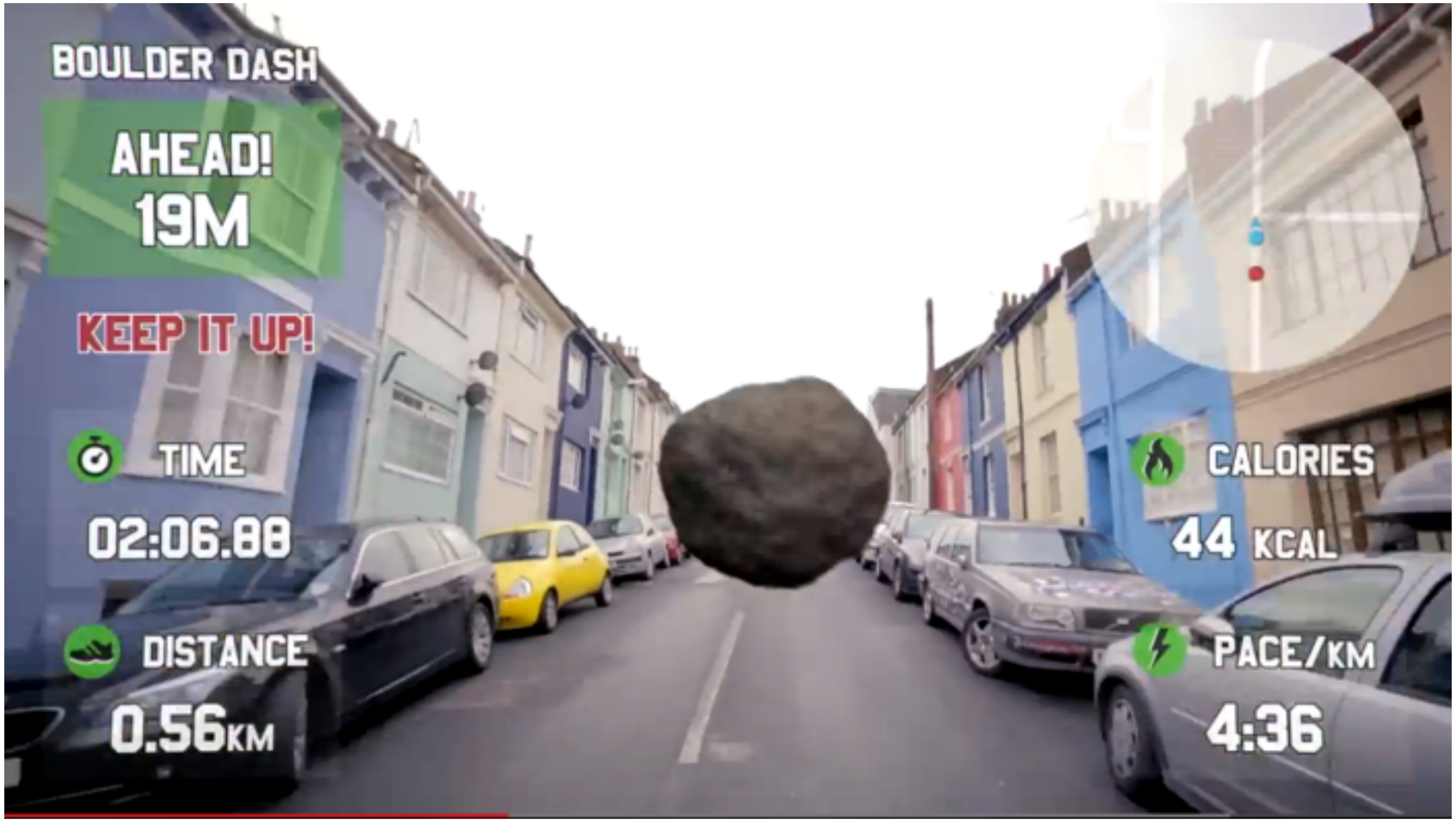
Firefighter

Exercise

Exercise

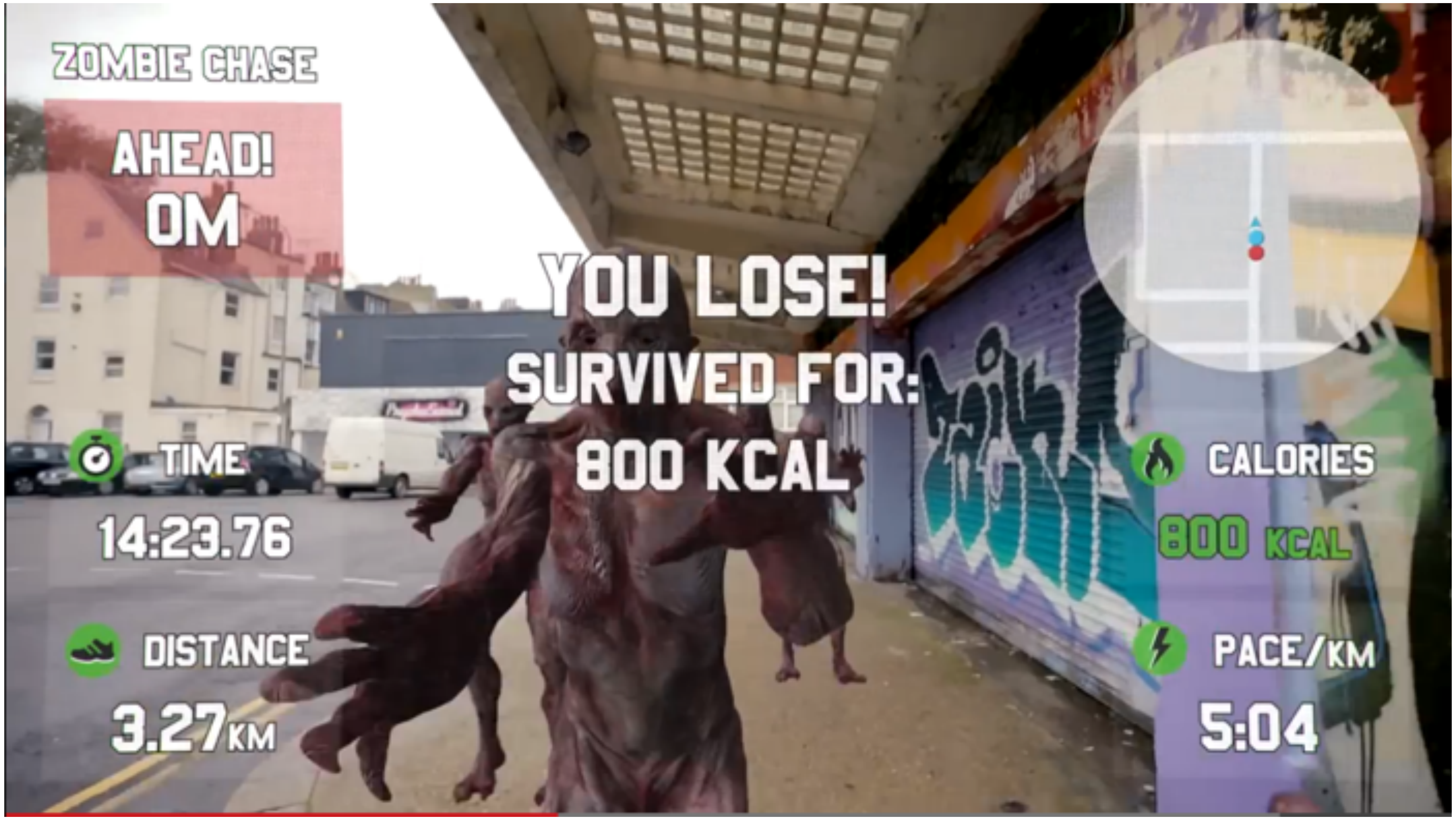

RACE YOURSELF
BEHIND!
4M
KEEP UP!
TIME
01:43.00
DISTANCE
0.29KM
CALORIES
14 KCAL
PACE/KM
3:47

Exercise



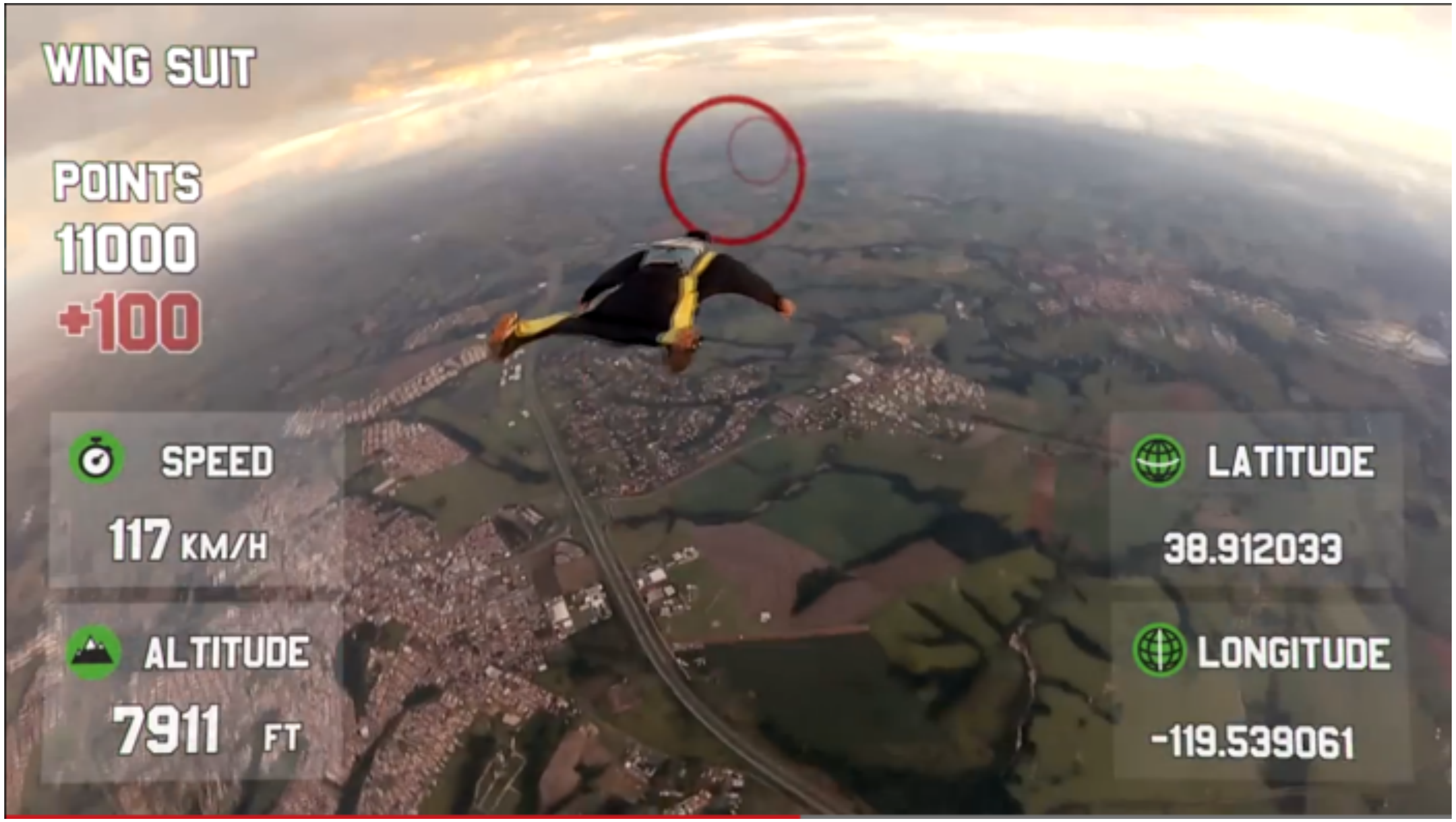
JAYWAY

Exercise

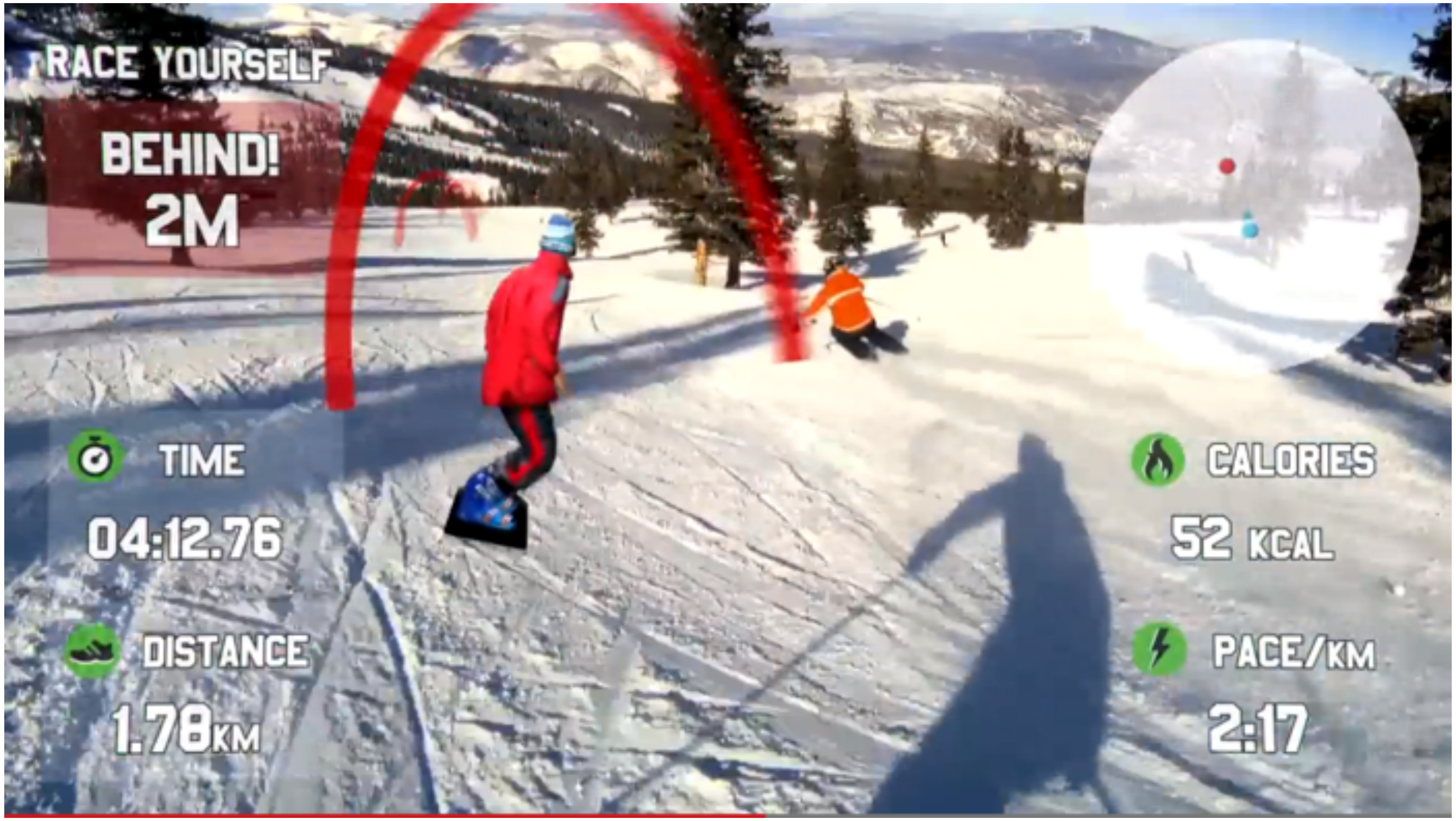


JAYWAY

Exercise

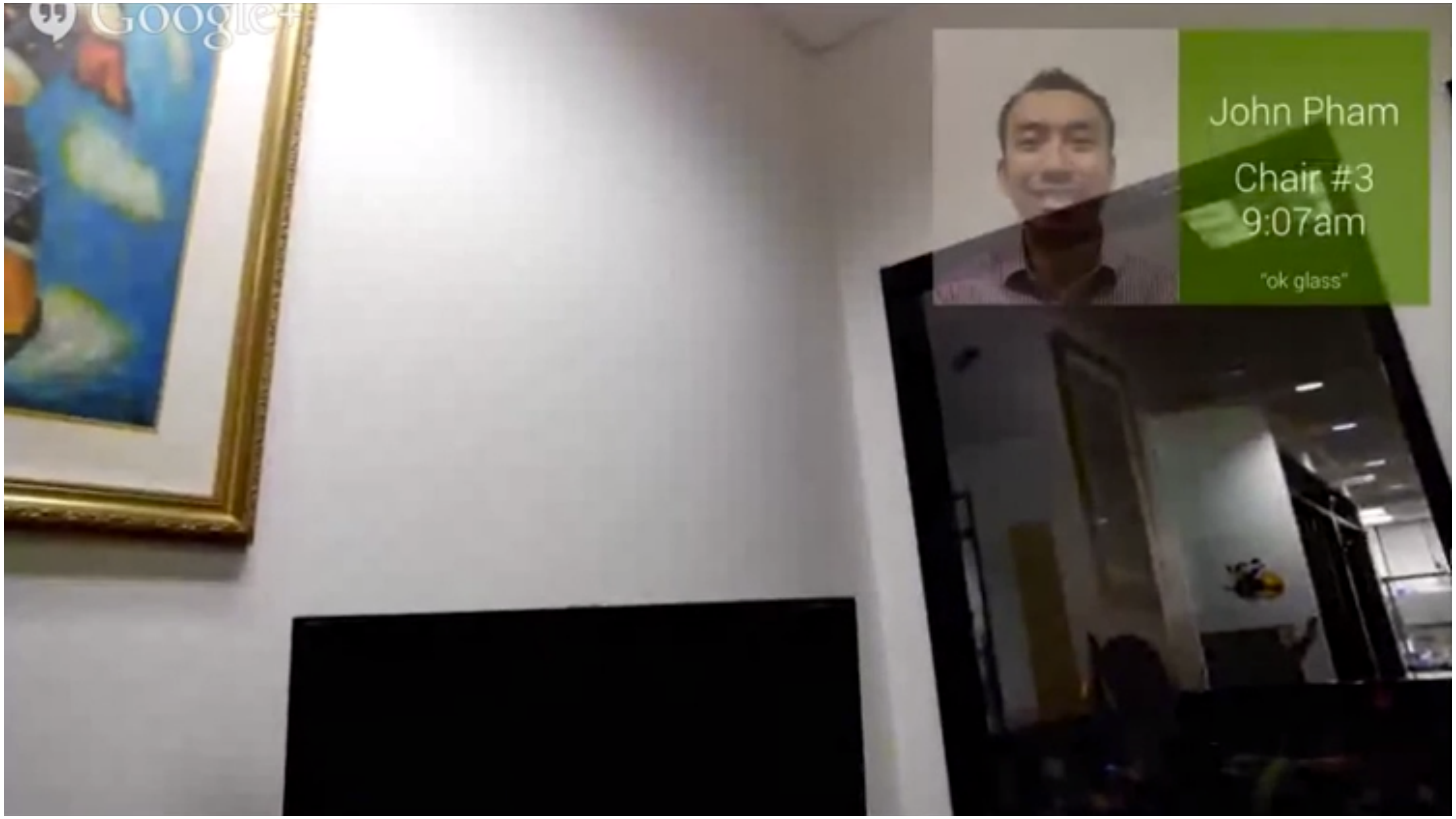

WING SUIT
POINTS
11000
+100
SPEED
117 KM/H
ALTITUDE
7911 FT
LATITUDE
38.912033
LONGITUDE
-119.539061

Exercise


RACE YOURSELF
BEHIND!
2M
TIME
04:12.76
DISTANCE
1.78KM
CALORIES
52 KCAL
PACE/KM
2:17

Dentist

Dentist

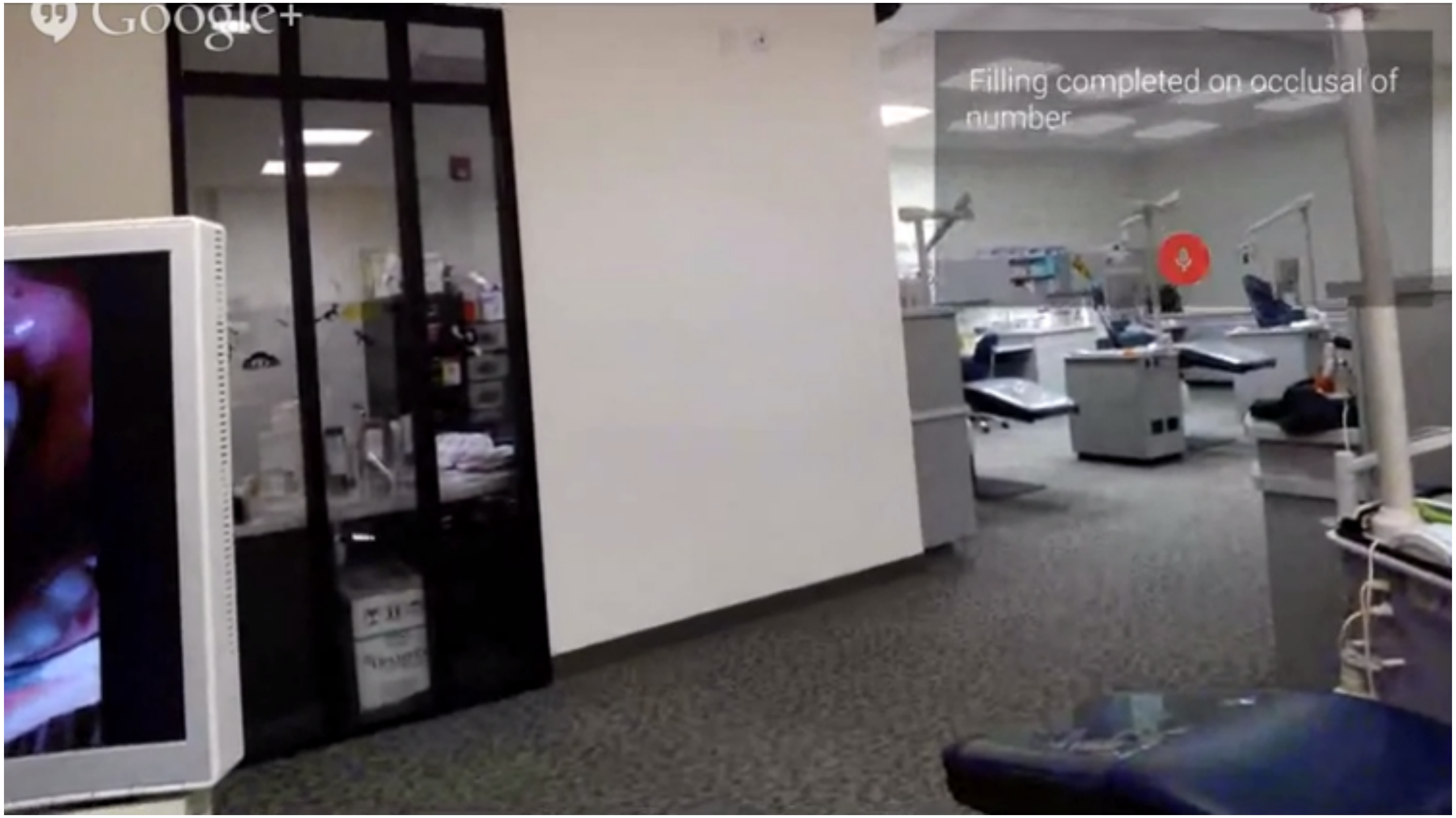


Dentist

JAYWAY

Dentist

Dentist



Surgery

Surgery

Surgery

Overall impressions

Competing Technology

Competing Technology

Competing Technology

JAYWAY

Competing Technology

Competing Technology

Competing Technology

Competing Technology

JAYWAY

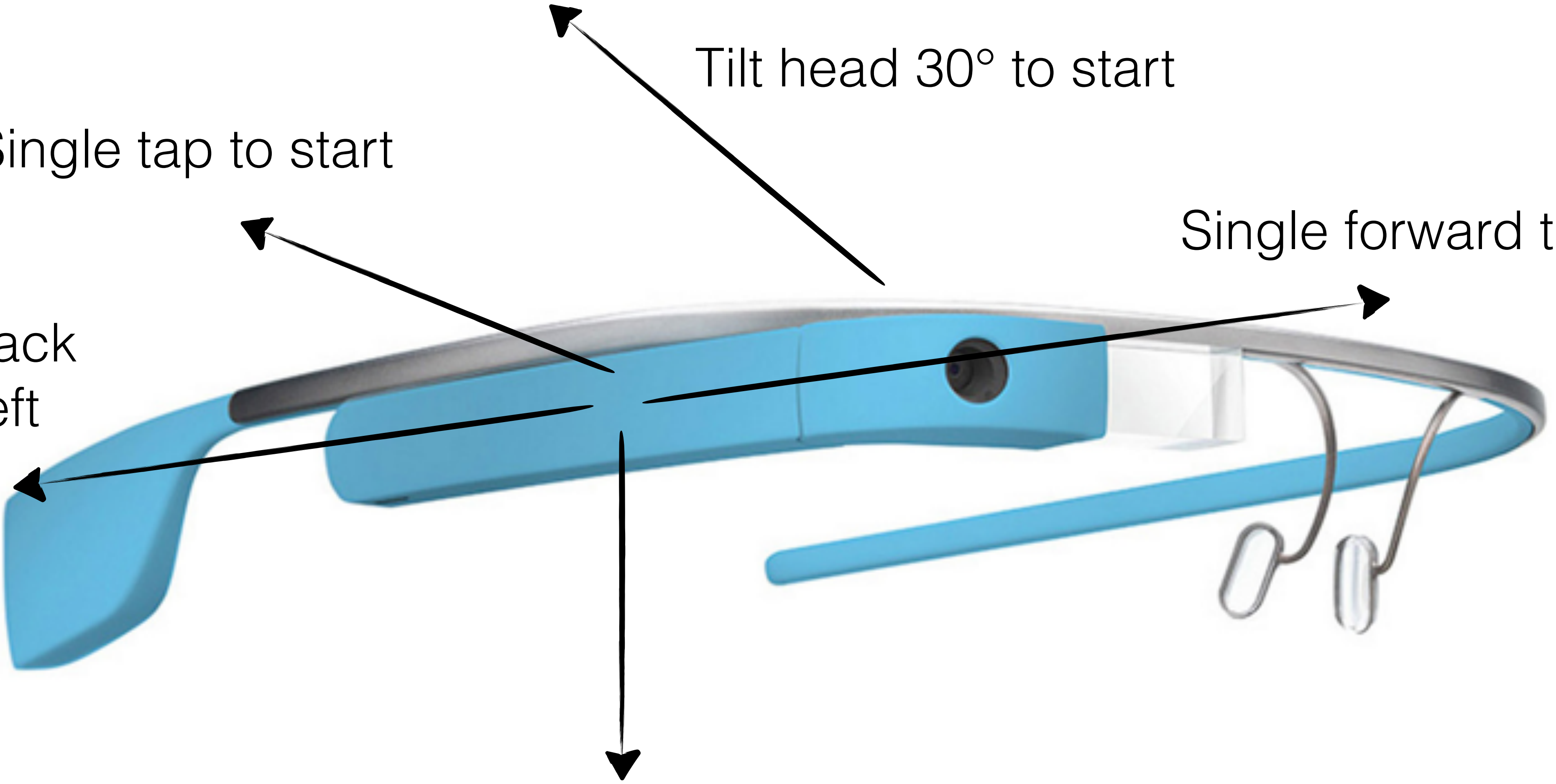
Questions

JAYWAY

Thank You!

JAYWAY

Quick Start



Tilt head 30° to start

Single tap to start

Single forward to go right

Single back
to go left

Single down to go back