View Concepts

iPhone Application Programming Lecture 4: User Interface Design

Chat Wacharamanotham Media Computing Group RWTH Aachen University Winter Semester 2013/2014 http://hci.rwth-aachen.de/iphone

- SDK provide many types of Views to show your content
- At run-time Views are organized as a tree
- Use Interface Builder to design your UI and connect it to code
- Geometry of Views are determined by constraints



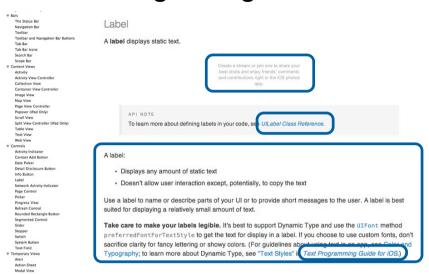
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Finding the Right View

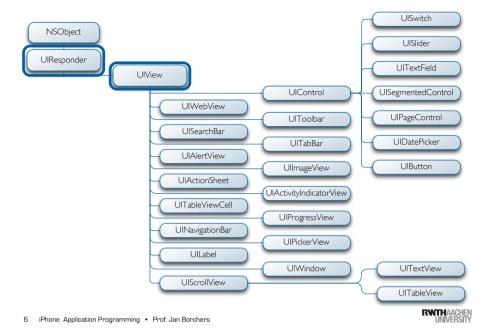


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View Concepts

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Demo: Hacking Calendar







View Concepts

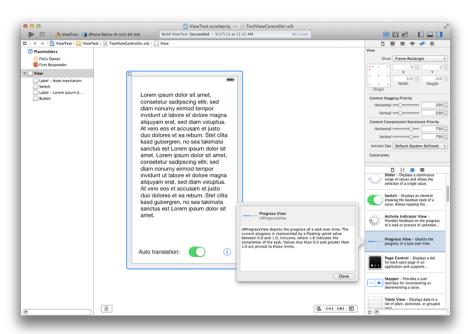
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Interface Builder

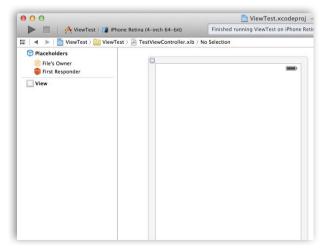
- Graphical tool to layout user interfaces
- Create the widget hierarchy
- Set attributes of widgets
- Set up connections between the widgets
- Store these informations in nib files



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The Anatomy of a xib File







The Source of a xib

```
rchive type="com apple InterfaceBuilder3 CocoaTouch XIR" version="8 00">
                <int key="IBDocument.SystemTarget">1280</int>
<string key="IBDocument.SystemVersion">11C74</string>
<string key="IBDocument.InterfaceBuilderVersion">1938</string>
                 <string key="IBDocument.AppKitVersion">138.23
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                            <string key="NS.key.0">com.apple.InterfaceBuilder.IBCocoaTouchPlugin</string>
                            <string key="NS.object.0">933</string>
                 </object>
<array key="IBDocument.IntegratedClassDependencies">
<string>IBUITextView</string>
                            <string>TBUTSwitch</string>
                             <string>TBUTButton</string>
                           <string>IBUIDUTEON
<string>IBUIView</string>
<string>IBUILabel</string>
<string>IBProxyObject</string>
                 </array>
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                 <string key="MS.key.0">PluginDependencyRecalculationVersion</string>
<integer value="1" key="NS.object.0"/>
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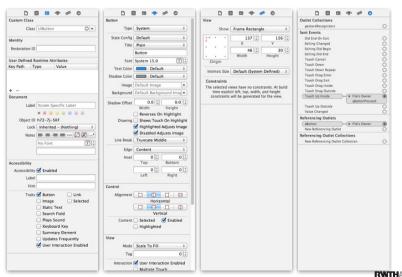
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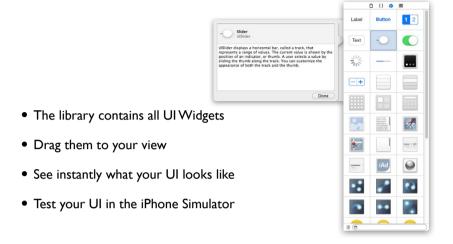
<string key="MSV*Flags">262, 203, 208, 385)]-/string>
                                                              <reference key="NSSuperview" ref="474857037".</pre>
```

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Set Widget Attributes



Laying out the User Interface



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Connecting Widgets and Code

- IBActions
- Tags a method as a target for an interface action
- IBOutlets
- IBOutletCollection
- Variables to populate with objects from a nib file



Connecting Widgets and Code

```
▼ Outlets
                                                                            operatorDivision
                                                                            operatorEqual
                                                                             operatorMulti
                                                                            operatorPlus
                                                                             searchDisplayController
@interface iCalcView: UIView {
                                                                            view
                                                                            Outlet Collections
                                                                                            # Button - 1
- (IBAction)addDigit:(id)sender;
                                                                                            # Button - 2
(IBAction)calculateResult:(id)sender;
                                                                                            # Button - 3
                                                                                            # Button - 5
                                                                                            # Rutton - 6
//declared properties
                                                                                            # Button - 7
//textfield
                                                                                            # Button - 9
@property (nonatomic, weak) IBOutlet UITextField *textfield;
                                                                            Referencing Outlets
//operators: + =
@property (nonatomic, weak) IBOutlet UIButton *operatorPlus

▼ Referencing Outlet Collections

@property (nonatomic, weak) IBOutlet UIButton *operatorEqual;
//digits
@property (nonatomic, weak) IBOutletCollection (UIButton) NSArray* digitButtons;
```

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Interface Builder Demo



View Concepts

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Auto Layout

• Preferred layout management

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- Allows you to create views that work both in portrait and landscape mode
- Available in iOS 6 and higher
- Spatial relationships expressed by constraints





Auto Layout Constraints

- Constraints are mathematical expressions
 - <=, ==, =>
- Constraints have a priority level
- The runtime tries to solve the system of equations

RWITHAACHEN UNIVERSITY Adding Constraints

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UIView

- Defines a rectangular area on the screen
- Two responsibilities
- Render content
- React to user input
- Manage subviews
- Layout as view hierarchy





THE TIMES

Clarke to shut six prisons to save cash

Move as 'hellish' conditions attacked by jails watchdog

Richard Ford, Rachel Sylvester

Six prisons are facing closure under government plans to send thousands fewer criminals to jail, The Times has learnt. About 5,000 cells and 10,000 jobs will be lost in England and

Wales as Kenneth Clarke waies as Reinieri Clarke prepares to enact a huge budget reduction at the Ministry of Justice. Officials are drawing up a Green Paper to overhaul number of offenders behind har



sentencing, aimed at reducing the Flight from Fire Mountain. Villagers flee from deadly volcanic ash cloud

Woolas ousted over election

A Labour frontbencher was stripped of his seat and susp from the party yesterday a judges found that he know

cry meets its match

England's rugby players will today carry out the time-honoured fey lemons as the world's best

detainee

Damning footage of British soldiers mistreating an Iraqi man at a secret detention facility was

Eight hurt as cement mixer

Eight hurt as cement mixer falls on train Several people were injured yesterday when a cement mixer fell from a bridge on to a train in Surrey. The lorry appeared to



The Times

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Woolas ousted over election slurs

Woolas ousted over election s

Former Immigration Minister suspended for Iving about Lib Dem

stripped of his seat and suspender from the party yesterday after two judges found that he knowingly

judges found that he knowingly lied about his opponent in campaign leaflets. Phil Woolas, the former Immigration Minister who was appointed to the shadow home affairs team by Ed Miliband last month, wrongly and deliberately accused his Lib Dem opponent of accused his Lib Dem opponent of "wooing Muslim extremists". He also issued leaflets days before the election suggesting his rival "reneged on his promise to live in

in general and local elections or standing for any elected public office for three years, in the first such ruling for 99 years.

Saddleworth, which Mr Wools won in May by a margin of 103.

Harriet Harman, Labour



election while this is pending.

The coalition is all but certain to face the first by-election telestrature. Woolas's and its stem became to face the first by-election telestrature. Woolas's to face the first by-election telestrature woolas's to face the first by-election telestrature to the displayment of the disp



The influential Labour figure was barred yesterday from voting constituency of Oldham East & sai Saddleworth which Mr Woolas chi



office for three years, in the girls when the such ruling for 99 years. Woolss was also ordered to paye costs, which are likely to be substantial, to his Lib Dem opponent. He confirmed yesterdigy that he would seek a placeful and said that the party would not judicial reives, withough he will not be allowed to stand in a by-likely to influence what is effectiven while this perading.

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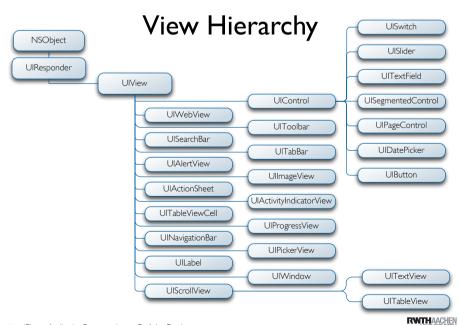
reneged on his promise to live in the continuous, in the continuous interest and the c

Saddleworth, which Mr Woolas won in May by a mangin of 103. Harriet Harman, Labours' deputy leader, announced Woolas's suspension, saying it was 'not part of Labour's politics to try to win elections by telling lies' and said that the party would not support an appeal. The rulling is likely to influence what is considered acceptable in future election literature. Woolas's societoe, Gerald Shamushi, inside

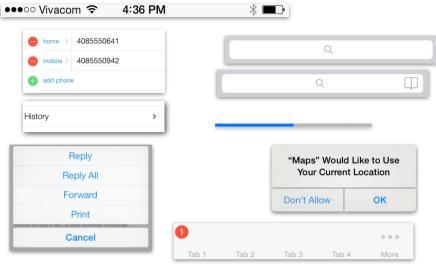
"It is vital to our democracy that those who make statements about the political character and seats in the conduct of election candidates are

The Times



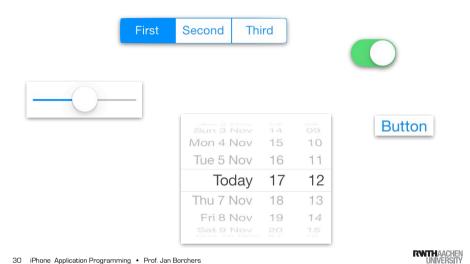


UI Widgets



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Control Widgets



View Categories: Examples

Containers: UIScrollView

• Controls: UlButton

• Display views: UllmageView

Text and web views: UITextView

Alert views: UIAlertView

• Navigation views: UITabBar

UIWindow

UIViewController

- Manages typically one screen
- Flushes the view on low-memory situations
- Resizes the view on orientation change
- Creates modal views on top of the current view



