iPhone Specialist Lab
L05: Drawing I (Views and CoreGraphics)

Prof. Dr. Jan Borchers, Florian Heller, Jonathan Diehl
Media Computing Group, RWTH Aachen University

2011

http://hci.rwth-aachen.de/iphone

View Controllers

The First View Controller

```
   // create the view controller
myViewController = [[MyViewController alloc]
initWithNibName:@"MyViewController" bundle:nil];

// attach the view controller's view to the window
[self.window addSubview:myViewController.view];

// show the window
[self.window makeKeyAndVisible];
```

Modal View Controller

```
   // create the view controller
MyViewController *myViewController = [[MyViewController alloc]
initWithNibName:@"MyViewController" bundle:nil];

// present it modally
[self presentModalViewController:myViewController animated:YES];

// clean up memory
[myViewController release];
```

Navigation Controller

```
   // create the navigation view controller
navigationController = [[UINavigationController alloc]
initWithRootViewController:rootViewController];

// attach the navigation view controller's view to the window
[self.window addSubview:navigationController.view];
```

In RootViewController:

```
// push a new view controller to the top of the navigation stack
[self.navigationController pushViewController:myViewController
animated:YES];

// pop the active view controller from the navigation stack
[self.navigationController popViewControllerAnimated:YES];
```

Tab Bar Controller

```
   // create the tab bar controller
tabBarController = [[UITabBarController alloc] init];
tabBarController.viewControllers = [NSArray arrayWithObjects:vc1,
vc2, nil];

// attach the tab bar controller's view to the window
[self.window addSubview:tabBarController.view];
```

Lab 6.1

- Create a new Window-based Application
- Create a TabBarController with 2 tabs:
  - Navigation Controller
  - MyViewController
- Every time MyViewController is shown, ModalViewController is displayed modally
- ModalViewController should offer a button to dismiss itself

Views

UIView

- Defines a rectangular area on the screen
- Responsibilities:
  - Render content
  - Arrange subviews
  - React to user input

iPad 17:44 Not Charging

THE TIMES

Samstag, 6 November, 2010

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 prepares to enact a huge budget reduction at the Ministry of Justice. Officials are drawing up a Green Paper to overhaul sentencing, aimed at reducing the number of offenders behind bars.

The move, a reversal of the previous Government's plans to increase spaces from the current 88,000 to 96,000, will fuel unease

Flight from Fire Mountain. Villagers flee from deadly volcanic ash cloud

IN THE NEWS

Woolas ousted over election slurs
A Labour frontbencher was stripped of his seat and suspended from the party yesterday after two judges found that he knowingly lied about his opponent in campaign leaflets.

Hacked off with haka? War cry meets its match
England's rugby players will today carry out the time-honoured tradition of huddling together like fey lemons as the world's best team rages about life, death and the hairy man.

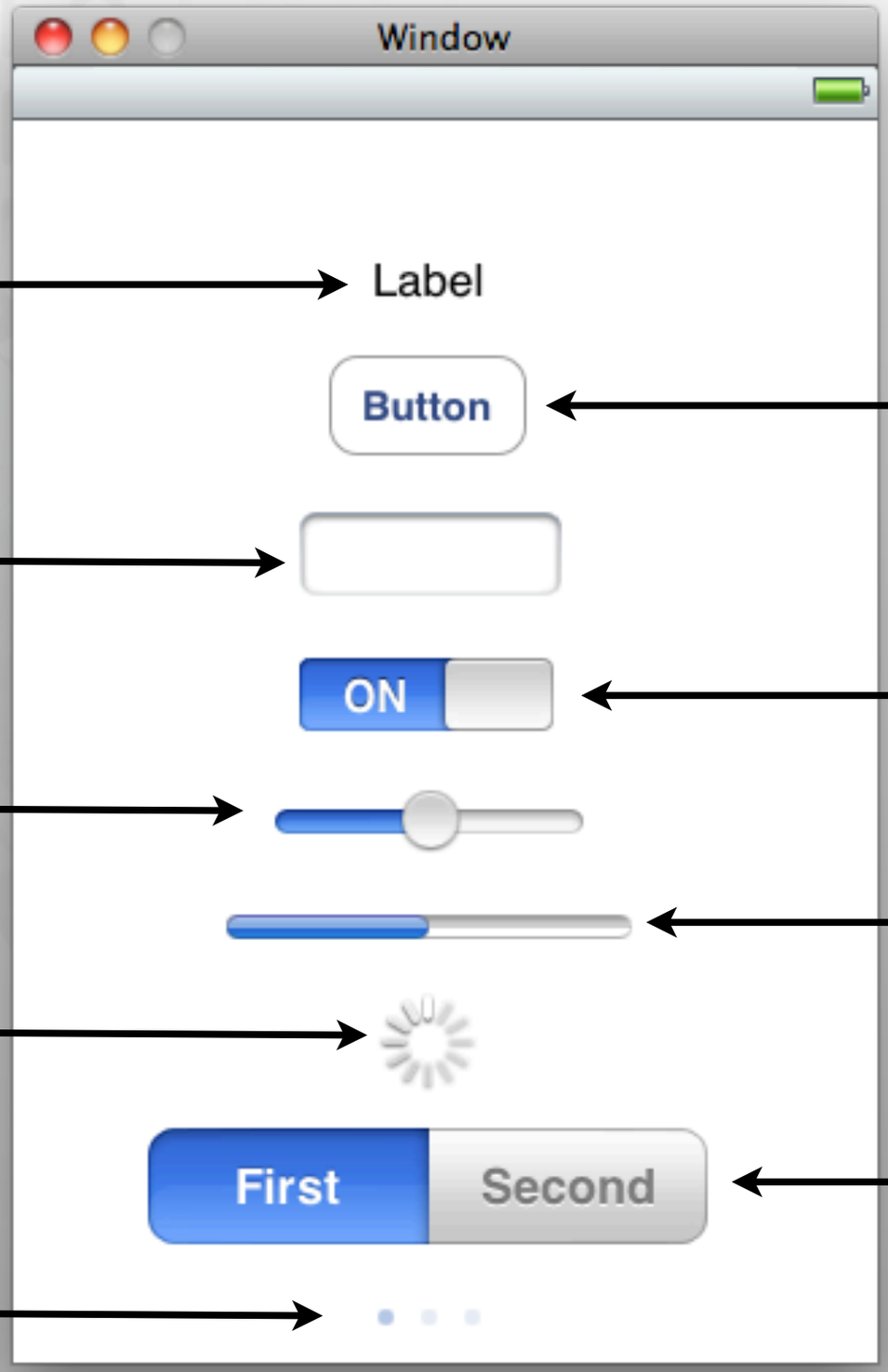
Video shows soldiers abusing detainee
Damning footage of British soldiers mistreating an Iraqi man at a secret detention facility was released yesterday as lawyers urged the High Court to grant a sweeping

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 have crashed through the brick wall above the Guildford to

The Times

Jan Borchers
media computing group

Simple Widgets



UILabel

UIButton

UITextField

UISwitch

UISlider

UIProgressView

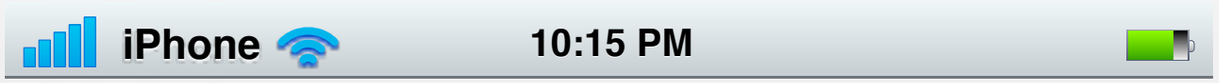
UIActivityIndicatorView

UISegmentedControl

UIPageControl

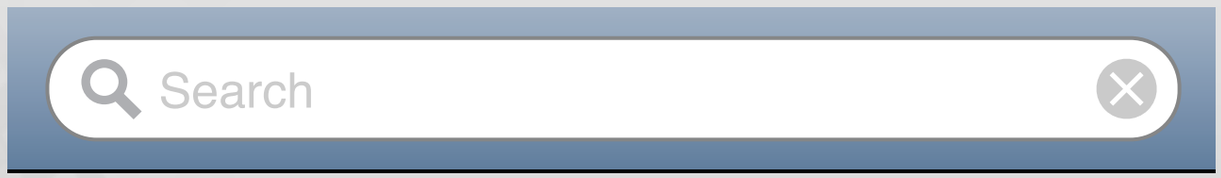
Bar Widgets

Status Bar



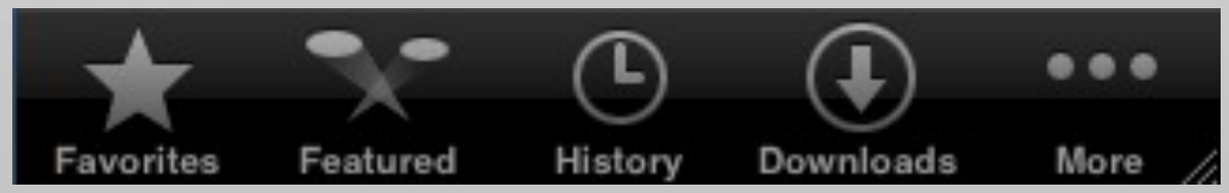
UINavigationBar

UISearchBar



UIToolbar

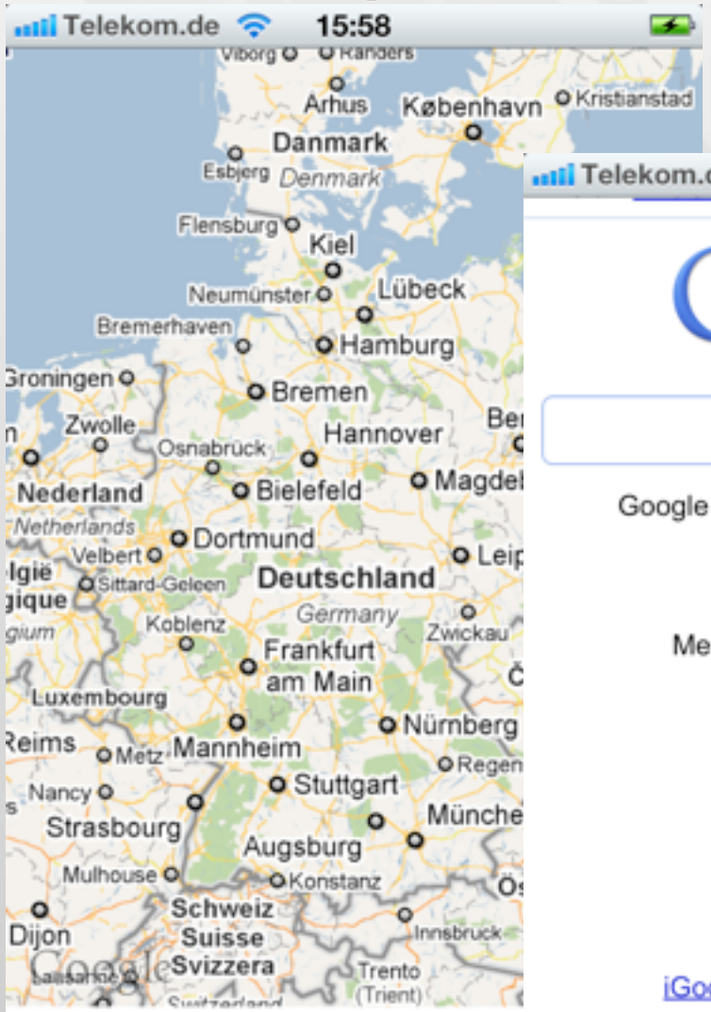
UITabBar



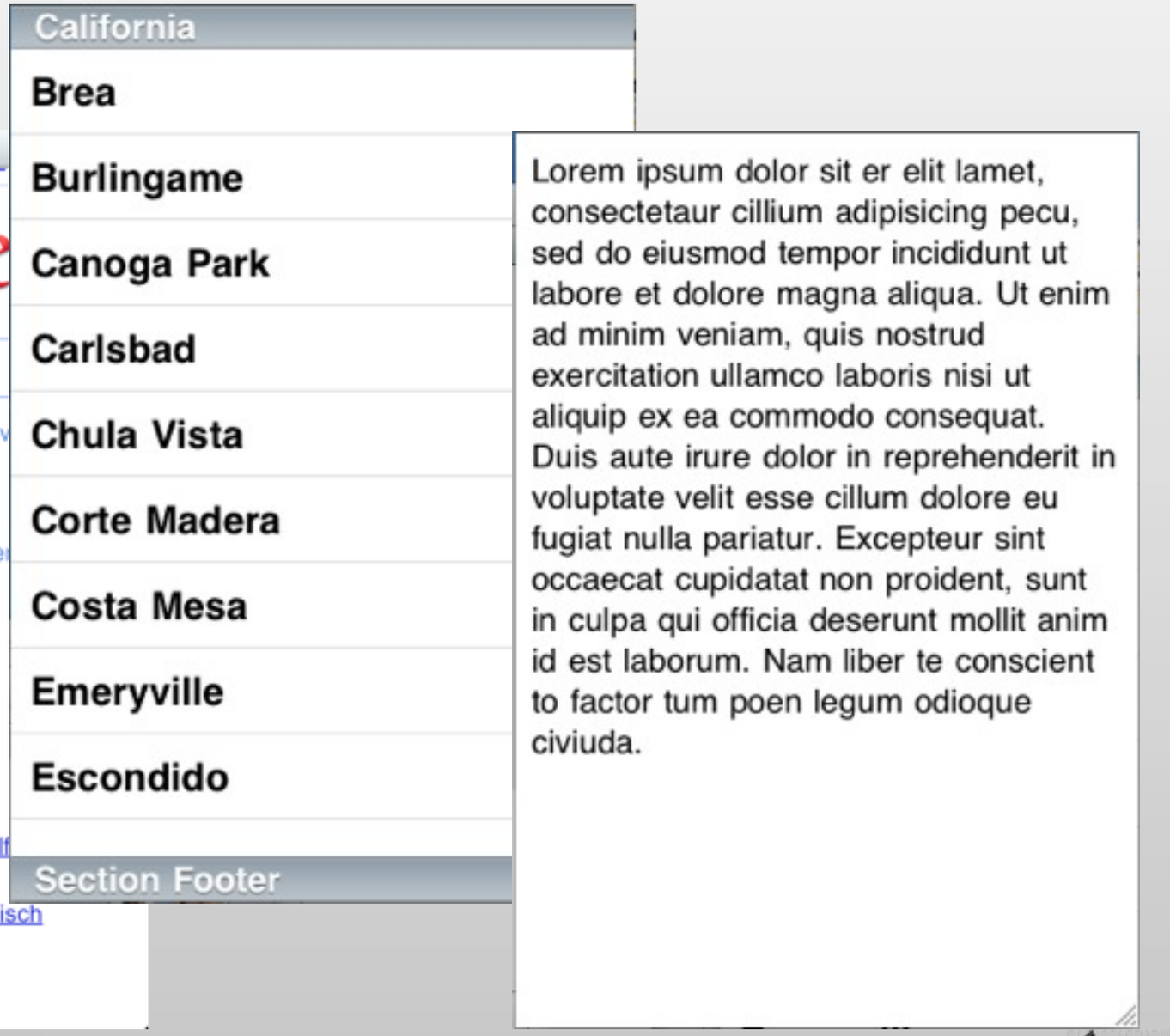
Jan Borchers
media computing group

Complex Views

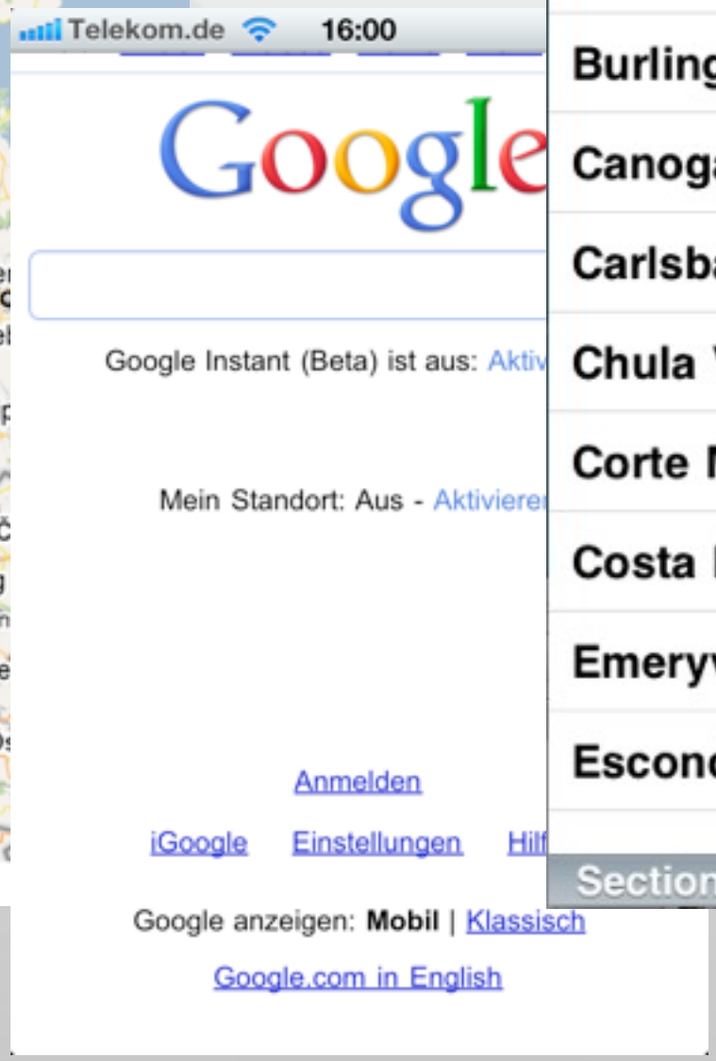
MKMapView



UITableView



UIWebView



UITextView

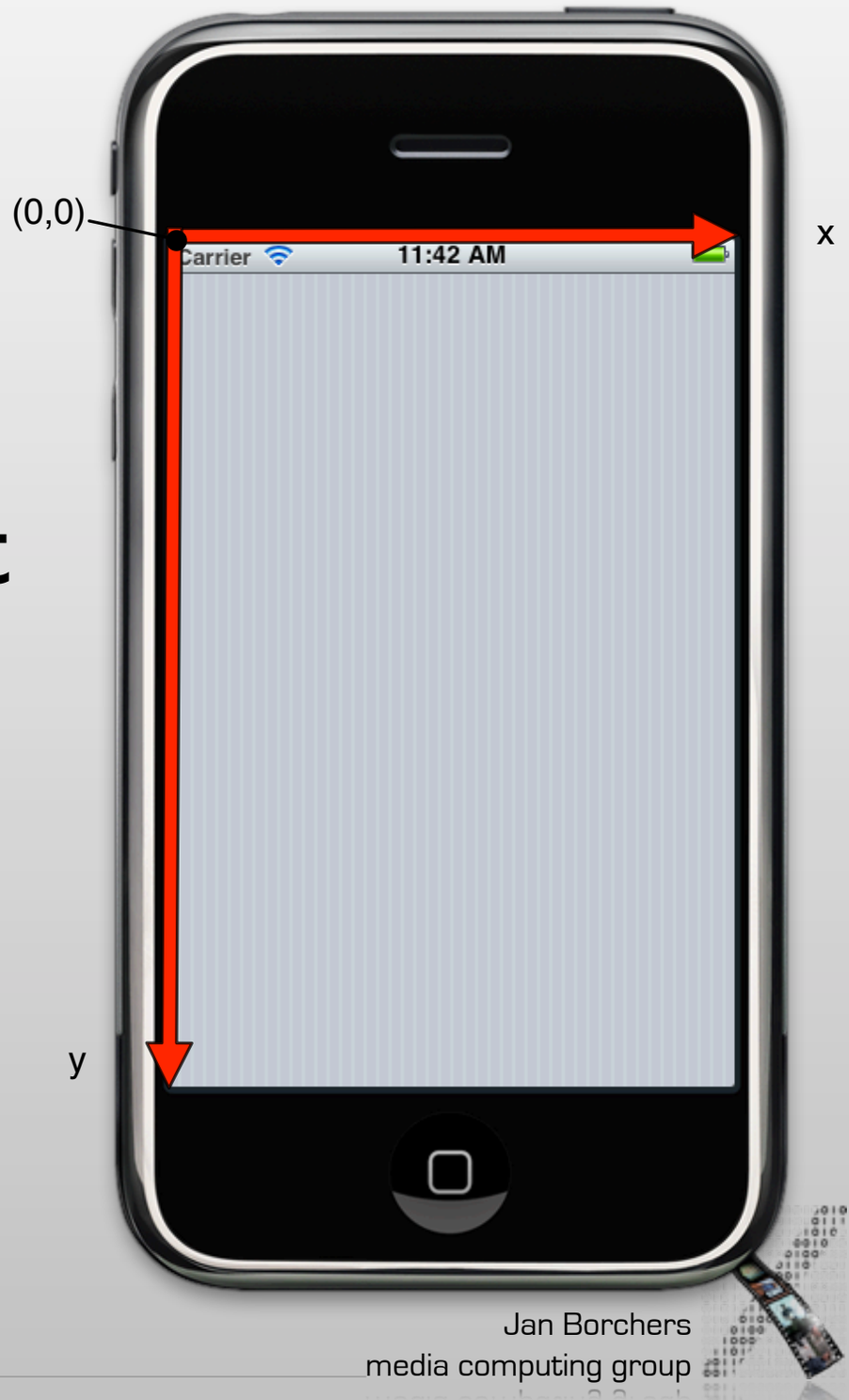
How to Layout Views

- In Interface Builder
- Programmatically
  - [view addSubview:anotherView]
  - [view removeSubview:anotherView]
- With ViewControllers

View Programming

View Coordinate System

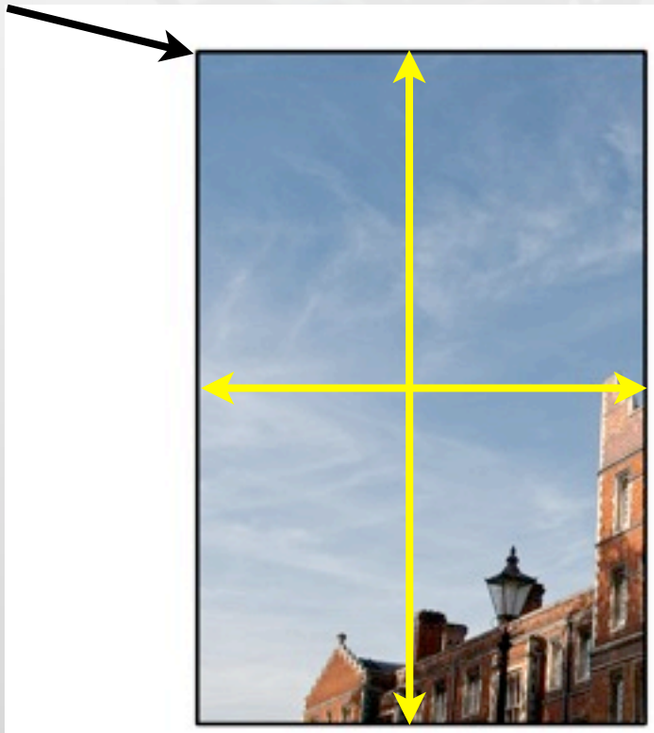
- Origin at top-left corner
- Coordinates use points as unit
  - iPhone 3G: 320x480
  - Retina display: 640x960
  - iPad: 768x1024



View Geometry

- Frame
  - A rectangle with origin and size relative to the superview
- Bounds
  - A rectangle with origin (0,0) and the size of the view
- Center
  - The center point of the frame rectangle

Frame vs. Bounds



Origin: (140.0,35.0)
Size: (320.0,480.0)

Origin: (0.0,0.0)
Size: (320.0,480.0)

Setting Values

- Setting `frame`:
  - `bounds` matches the size
  - `center` is adjusted
- Setting `center`:
  - The origin of `frame` is set accordingly
- Setting the size of `bounds`
  - The size of `frame` is set accordingly

Changing Bounds

Origin: (140.0,35.0)
Size: (320.0,480.0)

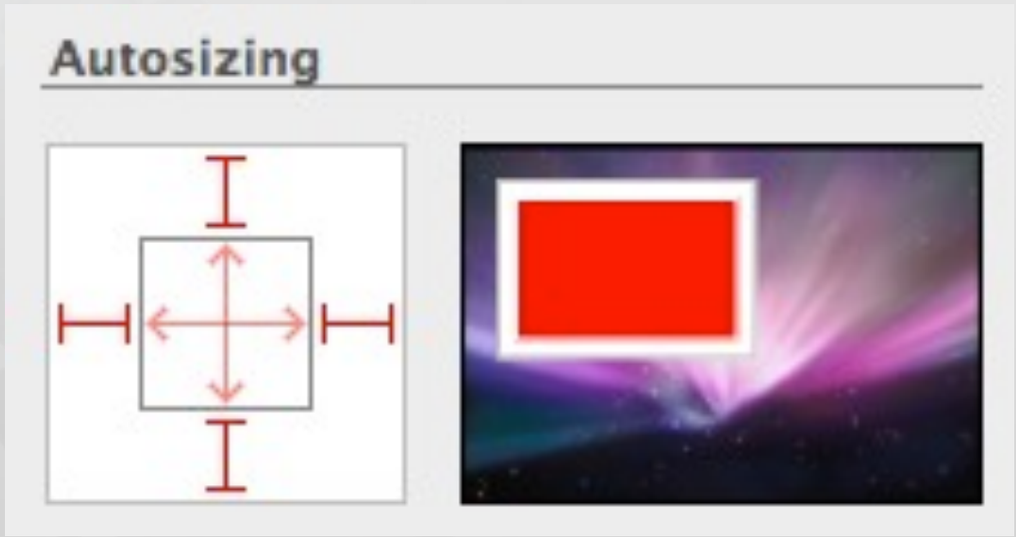
Origin: (190.0,150.0)
Size: (320.0,480.0)

The Transform-Property

- CGAffineTransform structure
- Applied during the rendering process
- Translation, rotation, zooming
- Set to identity transform by default
- All transformations are performed relative to the center point

Autoresizing Behavior

- Define an autoresize mask



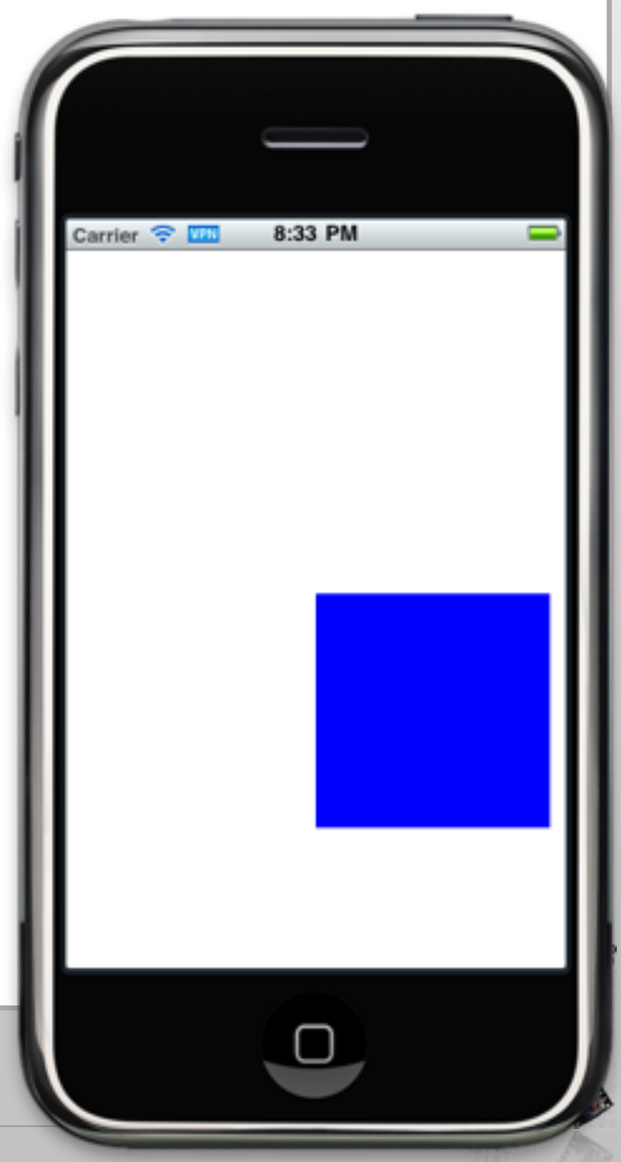
- Overwrite layoutSubviews

Creating Views

```
  // Create a view with blue background
CGRect viewFrame = CGRectMake(160, 240, 150, 150);
UIView *blueView = [[UIView alloc] initWithFrame:viewFrame];
blueView.backgroundColor = [UIColor blueColor];

// add it to the main window
[window addSubview:blueView];

// the window retains its subviews
[blueView release];
```



Managing Views

- addSubview
- insertSubview:atIndex:
- insertSubview:aboveSubview:
- removeFromSuperview
- bringSubviewToFront:
- sendSubviewToBack:
- exchangeSubviewAtIndex:withSubviewAtIndex:

Subclassing UIView

```
// Only override drawRect: if you perform custom drawing.
// An empty implementation adversely affects performance during animation.
- (void)drawRect:(CGRect)rect {}

   [view setNeedsDisplay];

// Overridden by subclasses to layout subviews when layoutIfNeeded is invoked.
// The default implementation of this method does nothing
- (void)layoutSubviews{}


   [view setNeedsLayout];
```

Lab 5.2

- Create a new View-based Application
- Change the view controller to create a view that displays a blue rectangle programmatically
- Move the rectangle around the screen with a timer
  - [NSTimer scheduledTimerWithTimeInterval:target:selector:userInfo:repeats:]