iPhone Programming Team

iPhone Application Programming Lecture 1: Introduction



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

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- Prof. Jan Borchers
- Chat Wacharamanotham, M.Sc.
- chat@cs.rwth-aachen.de
- Student Assistant: Aaron Krämer
- Specialized topic presenters





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Research projects summer 2011 Available at: <u>http://hci.rwth-aachen.de/videos/iphone1314/</u> <u>S01/i10Project2013.m4v</u>





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We Are in the App Store

Display Menu

Mirror Displays Start on Login Open Display Prefere

Recommend... Quit Display M

Color LCD 720 × 450 Cinema HD 2560 × 1600

Finder File Edit View Go Window Help

 File
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 1440 × 900
 1344 × 840

 1280 × 800
 1280 × 800

 1152 × 720
 1452 × 720

 1024 × 640

 1024 × 640

 1024 × 768

800 × 600

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Class Goals

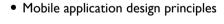
- Understand the differences between desktop and mobile development
- Look at a software framework designed from scratch
- Illustrate how established software engineering patterns are applied in the real world

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Format

- Lecture
 - Tue 9:15–11:45, room 2222
- Reading assignments
- Lab (20 spots)
- Mon 16:15–17:45, room 4U15
- 6 programming assignments
- Final project with presentation (TBA)
- Final exam: 10.03.14, 9:00–11:00 at room 2222



• iOS development basics

iEat for OS X

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Mensa Vite

Reload Menu Preferences...

Quit iEat

- View controllers & dialogs
- Input techniques
- Performance tweaking

- Data Persistence
- Networking
- iPad programming
- Location & maps
- Audio



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70%

3 ECTS
Lecture only6 ECTS
Lecture + LabAssignments10%Project20%

100%

Final Exam

Class Topics



Requirements

- OOP experience
- No Mac required
- We will supply Macs & iPods for the lab
- You must register for this course in CAMPUS
- Lab: apply before Friday Oct. 18th at: http://hci.rwth-aachen.de/iphone

iPhone Developer University Program

- RWTH is member of the iPhone Developer University Program
- Free on-device development for all students throughout the semester
- Invites will be sent to your RWTH email address
- You need to accept Apple's student agreement (online)

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Why Take this Class?

- We know HCI, OS X, and iOS
 - Projects, publications, AATCe
- High iTunes U ranking
- Updated to latest iOS 7



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



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All slides and lecture videos will be available on iTunesU



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The iOS Family



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Mobile Device Characteristics

Developing for Mobile Platforms

- Screen size is compact
- Memory is limited
- Users interact with one screen at a time
- Users interact with one application at a time
- Onscreen help is minimal
- Context is key (task focus, peripheral use)

User falls while texting Available at: <u>http://hci.rwth-aachen.de/videos/iphone1314/</u> <u>S01/user_falls_while_texting.mov</u>



9 Golden Rules of Interface Design (see DIS 1)

- Keep the interface simple
- Speak the user's language
- Be consistent and predictable
- Provide feedback
- Minimize memory load
- .

• Offer shortcuts for experts

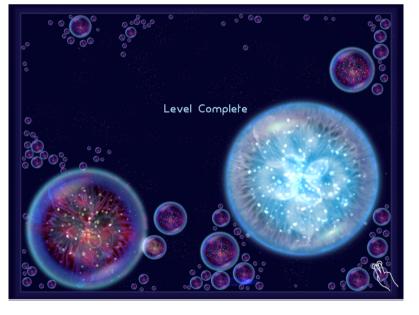
• Avoid errors, help to recover, offer undo

• Design clear exits and closed dialogs

• Include help and documentation

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Onscreen help in Osmos HD

Drill down structure example: Notes

Available at: http:// hci.rwth-aachen.de/ videos/iphone1314/S01/ Notes iOS7.mov

Life as an App

- The iPhone is an app-centric environment
- One app per task
- Do one thing but do it well
- Data is stored per app
- Data exchange between apps is difficult
- Define the task that users want to accomplish with your app

Designing the UI

- Make it obvious how to use your application
- Sort information from top to bottom
- Minimize text input
- Express information succinctly
- Provide fingertip-size targets



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Interaction Design

- Multitouch interaction is still new
- Interaction patterns not established yet
- Follow Apple's examples if possible
- If you use complex gestures, help the user



<u></u>	Тар	To press or select a control or item (analogous to a single mouse click).
In the	Drag	To scroll or pan.
Shifty -	Flick	To scroll or pan quickly.
Joseph Mark	Swipe	In a table-view row, to reveal the Delete button.
R	Double tap	To zoom in and center a block of content or an image. To zoom out (if already zoomed in).
うむ	Pinch open	To zoom in.
$\sqrt[n]{0}$	Pinch close	To zoom out.
J.	Touch and hold	In editable text, to display a magnified view for cursor positioning.





Designing the UI

• Five resolutions, three aspect ratios:

	Resolution		
	Classic	Retina	
iPhone	320 × 480	640 x 960	
iPhone 5(S, C)		640 x 1136	
iPad	1024 x 768	2048 x 1536	
iPad Mini	1024 x 768		



- Device orientation:
- Portrait or landscape
- Designing for the iPad requires more than increasing the resolution

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Converting desktop application to mobile: Mail

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Dank für Ihre Bestellung vom 07.04.2013	SNOWSport Team Aachen
Atlassian 19/03/2013 SourceTree for Windows is Now Available Read this in your browser A free, powerful Git desktop client for Windows Windows	http://www.sportarten.nwth-aachen.de/SkiAG
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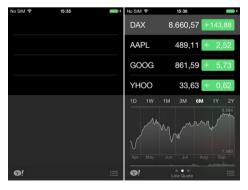
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Converting desktop application to mobile: iPhoto

Starting

- Apps should start quickly to provide a fluid user experience
- Show a launch image that closely resembles the first screen of your app
- Restore the state of last run
- By default, launch in portrait orientation.



Photos app in iOS 7

Available at: http:// hci.rwthaachen.de/videos/ iphone1314/S01/ Photos iOS7



Stop

- No *Quit* button or menu item
- Be prepared to quit at any time
- Program flow interrupted by external events
- Incoming phone call

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- Store state when stopping
- Application moved to background





- Organizing and managing detailed information
- Often organize data hierarchically
- Organizing the list, add or remove items
- Examples: Contacts, Photos

Application Styles



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Photos Albums	Favorites Recents Contacts Keypad Voicemail	
Photos	Contacts	Reminders

Productivity Applications

Photos





Utility Applications

- Simple task, minimum user input
- Customized, visually attractive UI that enhances the displayed information
- Data is organized in flattened list of items
- Examples: Weather, Stocks

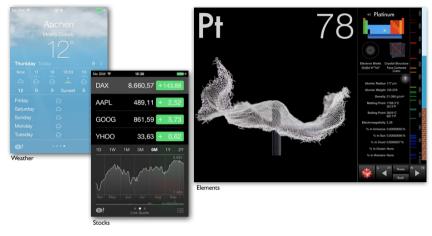
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Immersive Applications

- Full-screen, visually rich UI
- Focussed on content and user experience
- Tends to hide much of the device's user interface
- Custom navigational methods
- Examples: Living Earth, Carpenter

Utility Applications



Immersive Applications

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Living Earth

Carpenter

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Games

iOS 7 Design Themes



FlightControl

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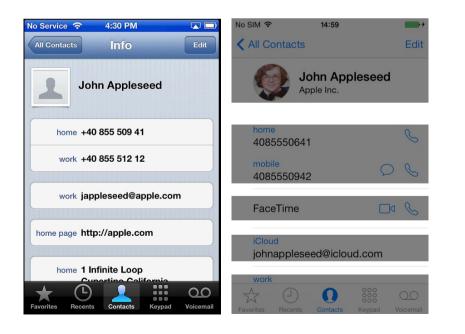
- Deference: The UI helps users understand and interact with the content, but never competes with it.
- Clarity: Text is legible at every size, icons are precise and lucid, adornments are subtle and appropriate, and a sharpened focus on functionality motivates the design.
- Depth:Visual layers and realistic motion impart vitality and heighten users' delight and understanding

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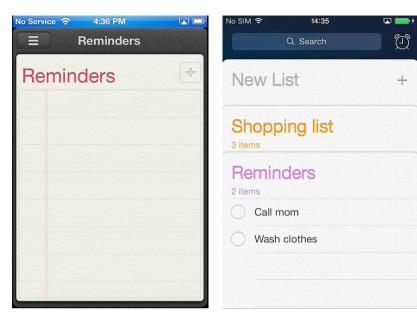
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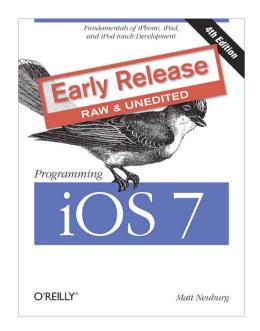
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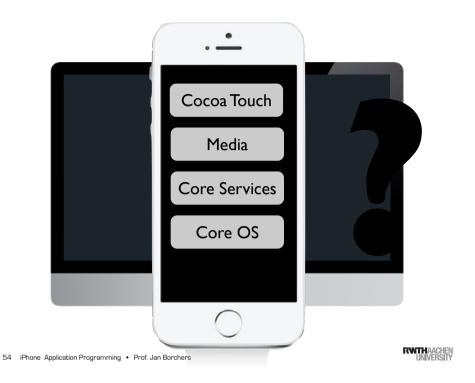
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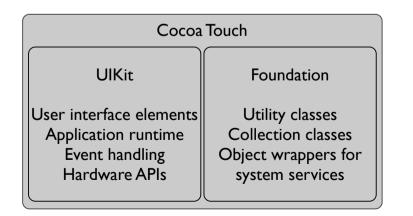






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Cocoa Touch Architecture





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Summary

- Mobile vs. desktop apps: user, task, context
- Keep hardware restrictions in mind
- Application styles: productivity, utility, immersive
- Reading assignment:
- Selected iOS Human Interface Guidelines and WWDC videos See hci.rwth-aachen.de/iphone for the list (required reading for exam and final project)



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