

COMP327
Mobile Computing

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Mobile Computing

Lecture 1 - Introduction

Today

- Why Mobile Computing?
- Admin and Module Development

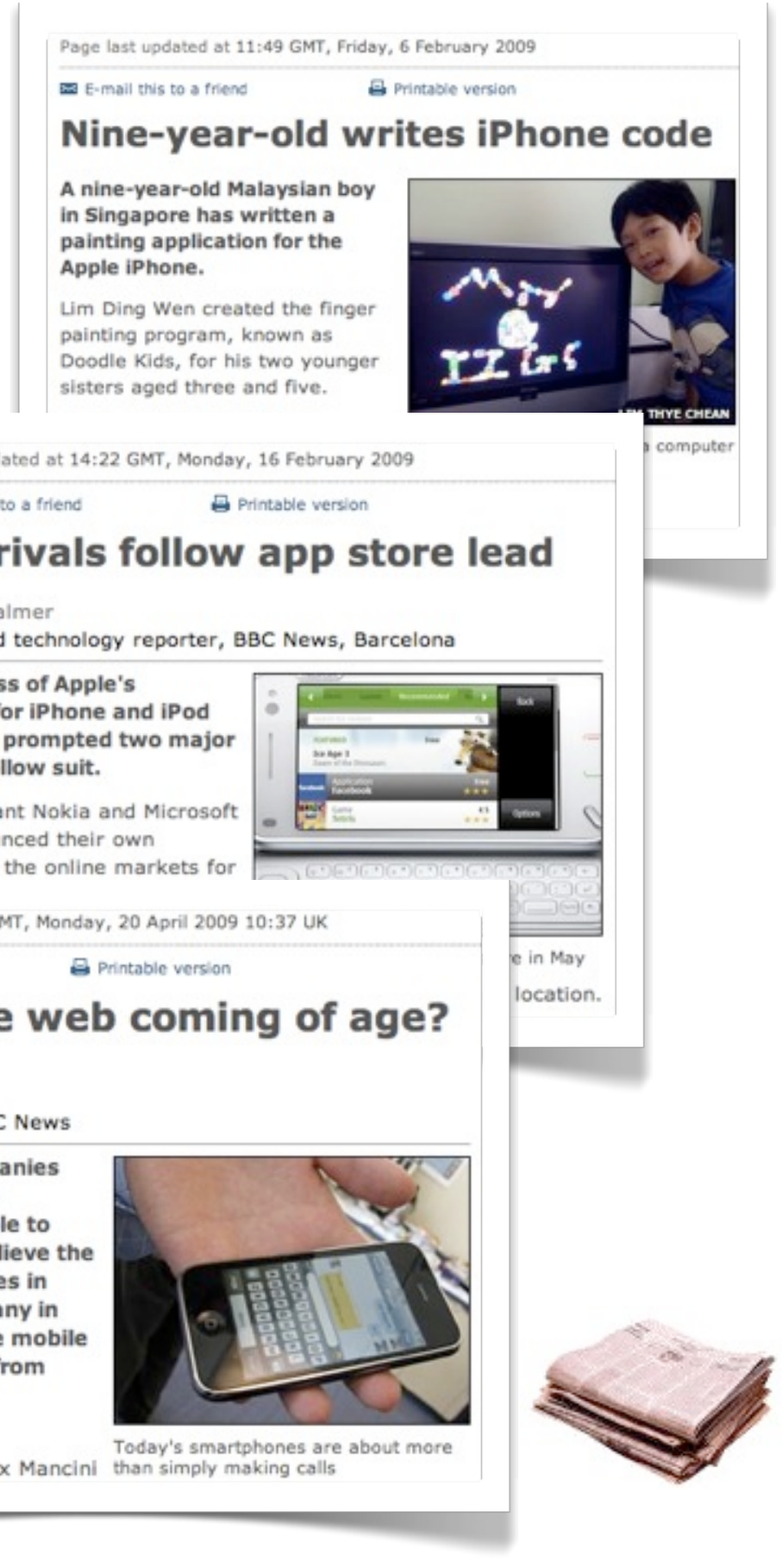




Why Mobile Computing???

Fourteen countries have more mobile phone subscribers than people

"… the number of mobile phone subscribers in the 30 countries of the OECD reached nearly 933m in 2005, equivalent to around 80 for every 100 people. Luxembourg has … 157.3 subscribers for every 100 phones…"



Appland: How smartphones are transforming our Lives



CAR KEYS
Zipcar shows nearby hire cars, which you can unlock and drive away using the app and iPhone alone

DRUG DEALER
See where (medical) marijuana is available to buy nearby with an app called Cannabis

NAME THAT TUNE
Want to know the details for the song that's playing? Just hold your smartphone near the speaker and let Midomi or Shazam identify it for you

SECURITY CHECK
Biowallet scans your iris with the smartphone's camera to unlock access to your secret passwords

VITAL SIGNS
Cardio Calc, Critical Care and iHeartRate Monitor let you check your pulse and your blood pressure

SEX AND THE VICINITY
Apps such as Who's Here and Grindr link you up with like-minded people near your location for chat, dating or sex. Be prepared to be sent unsolicited photos of penises

PERSONAL SHOPPER
With Gocart and Snaptel, your phone camera can read barcodes, recognise books or album covers, then provide prices and reviews

BABYSITTER
Baby Rattle, Baby Monitor and Diaper Tracker can make life a little easier for tech-savvy parents



Courtesy of New Scientist, 19th Aug 09, Richard Fisher

http://www.newscientist.com/movie/mg20327220200-appland-how-smartphones-are-transforming-our-lives

Appland: How smartphones are transforming our Lives



1.5 billion
Number of apps downloaded in the first year of iPhone App Store

1/3
Proportion of app users who say "apps have changed my life"

64,500
New apps added to App Store since July last year

55 minutes
Average time per day app users spend on apps, about half the time they spend using it for calls

169
Number of new non-gaming apps appearing per day in the App Store

8
Number of app stores run by major manufacturers: Apple, Nokia Ovi , blackberry, Palm Pre, Google Android Marketplace, Windows Marketplace, LG, Samsung

$2,57
Average app price in July

22%
Less time that app users spend on a computer



Courtesy of New Scientist, 19th Aug 09, Richard Fisher

http://www.newscientist.com/movie/mg20327220200-appland-how-smartphones-are-transforming-our-lives

Module Aims

1. To provide guidelines, design principles and experience in developing applications for small, mobile devices, including an appreciation of context and location aware services
2. To develop an appreciation of interaction modalities with small, mobile devices (including interface design for non-standard display surfaces) through the implementation of simple applications and use cases.
3. To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.
4. To understand the use of transaction and e-commerce principles over such devices to support mobile business concepts
5. To appreciate the social and ethical issues of mobile computing, including privacy.

Module Objectives

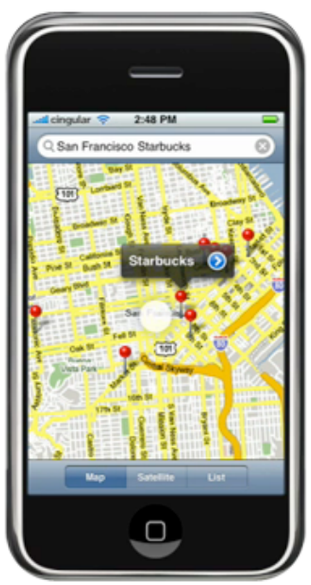
At the end of the module, the student will be able to demonstrate:

1. A working understanding of the characteristics and limitations of mobile hardware devices including their user-interface modalities.
2. The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.
3. A comprehension and appreciation of the design and development of context-aware solutions for mobile devices.
4. An awareness of professional and ethical issues, in particular those relating to security and privacy of user data and user behaviour.

Mobile Application Development



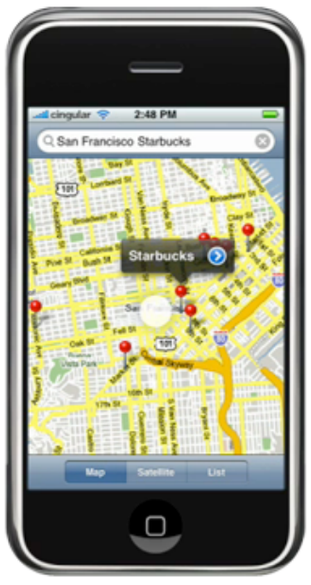
- Introduction to development frameworks
  - Focus will be on iPhone development
  - Some discussion on Java ME, and Android
  - Material will cover:
    - Web-app development through Dashcode
    - iPhone development using Objective C and iPhone SDK



Mobile Application Development



- Why iPhone / iPod Touch?
  - Good IDE, test and evaluation environment
  - Uniform platform - good for assignments
  - Currently more lucrative than other competitors...

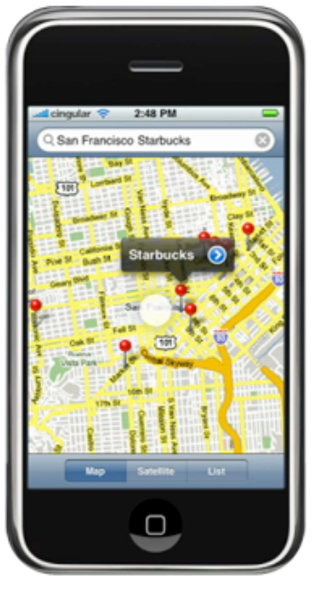


Mobile Application

Larva Labs, which currently holds the #5 and #12 rankings on the Android Market list of top paid applications, brought in an average of $62.39 per day total during the month of August. According to TapTapTap developer John Casasanta, whose Convert app currently holds the #2 spot in the App Store, a comparably ranked #5 iPhone app would sell about 6,500 units a day worldwide. This would translate into earnings of $22,704/day for a $4.99 application (like Larva Labs') or $4,504/day for a $0.99 application.

Mac Rumors - 2nd Sept 2009
http://www.macrumors.com/2009/09/01/developer-offers-inside-look-at-sales-gap-between-app-store-and-android-market/

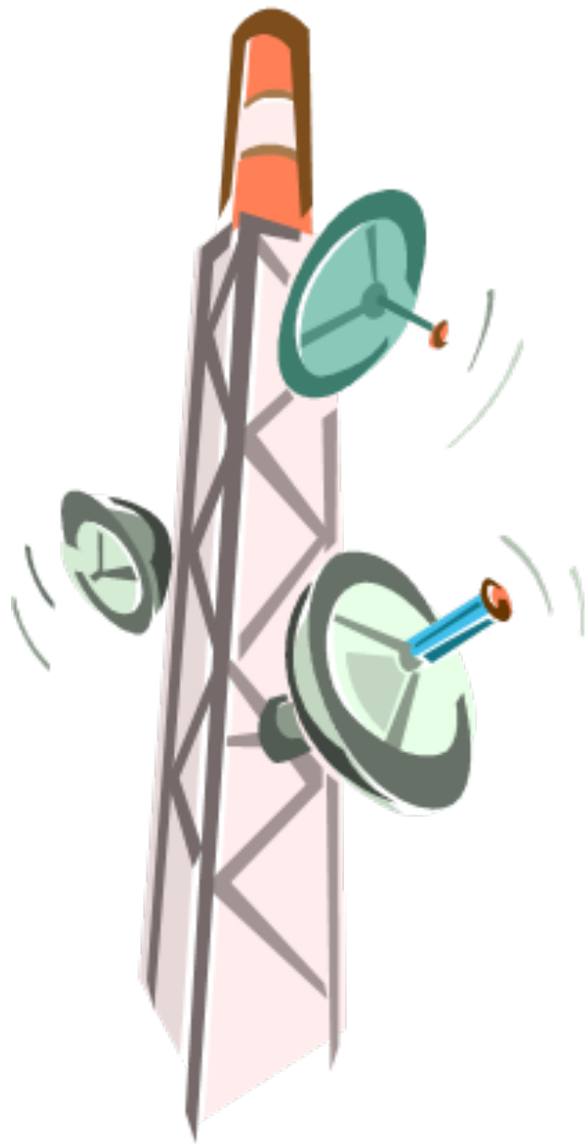
	Estimated Number of Users	% Who Buy Paid Apps	Average $/Month Spent on Paid Apps	Est. August 2009 Paid App Market Size
Android	3M [1]	19%	$8.63	$5M
iPhone	26.4M [2]	50%	$9.49	$125M
iPod touch	18.6M [3]	40%	$9.79	$73M



Mac Rumors - 27th August 2009
Mac Rumors - 2nd Sept 2009http://www.macrumors.com/2009/09/01/developer-offers-inside-look-at-sales-gap-between-app-store-and-android-market/

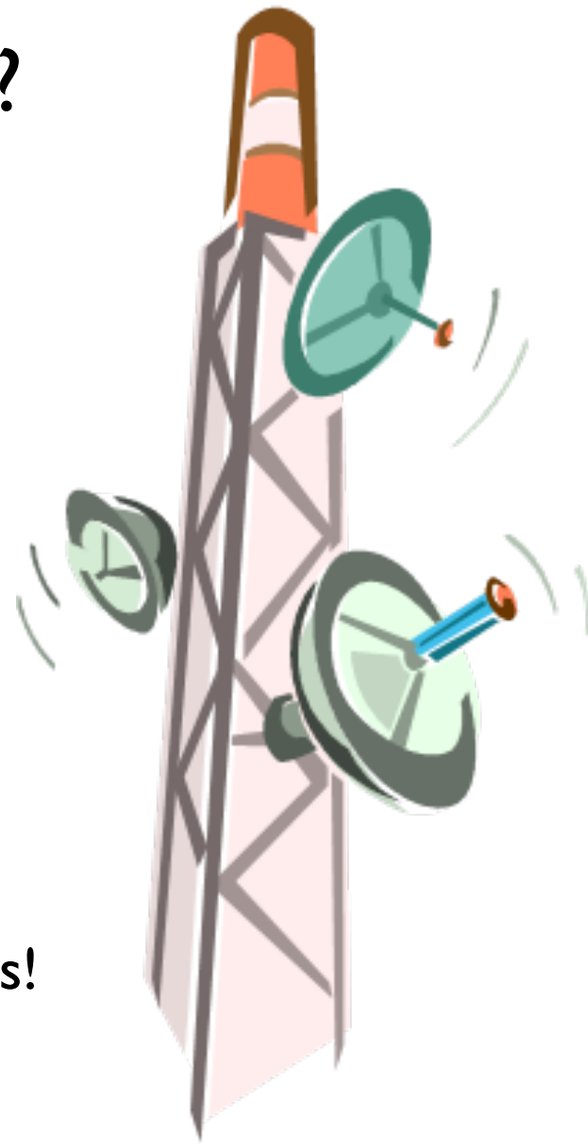
Mobile Communication

- Communication Mechanisms
  - 2G/3G Cellular Networks;
  - WiFi Lans;
  - Zigbe/RFID/Bluetooth
- Mobile Internet
  - SMS, WAP, WML, iMode, Web Aps

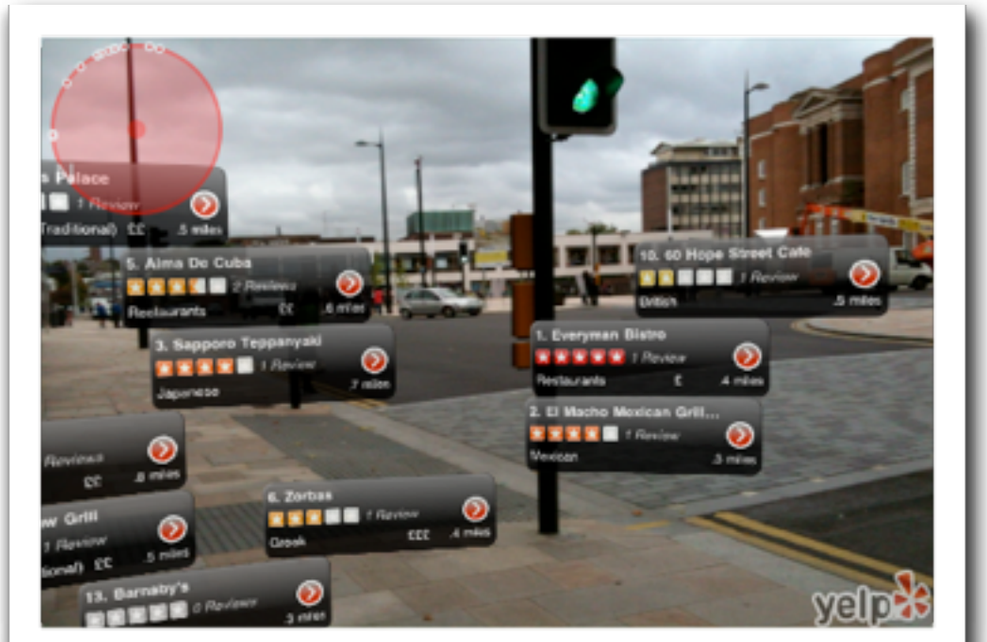


Mobile Communication

- Why 2/3G and Wifi Communications?
- So you understand:
  - Packet vs Circuit Switching, and why this affects the cost of data.
  - The difference between GSM and GPRS, and why EDGE was so easy to roll out
  - Why Europe had MMS in 2002, yet ATT have just rolled this out in the US last week.
    - And why San Francisco and the Bay Area have really poor 3G quality-of-service for iPhone users!



Mobile Application Development





- Human Computer Interaction
  - Interfaces on small displays with limited user attention
  - Interaction modalities - touch/swipe interaction, accelerometers, predictive texting (T9)
- Context and User Models
  - Location Awareness
  - Preferences and Profiles

Social Issues

- M-Commerce and Mobile Payment
  - WAP Solo, Contactless Payment



- Mobile Privacy and Ethics
  - Protecting personal information
  - Threats to privacy and security



Admin

- Lecturer:
  - Dr Terry Payne
  - Room 205, Ashton Building
  - Email: T.R.Payne@liverpool.ac.uk
- Course Notes:
  - http://www.csc.liv.ac.uk/people/trp/COMP327.html
- Announcements (via RSS):
  - http://www.csc.liv.ac.uk/people/trp/Teaching/rss.xml

Module Delivery

- Lecture Times:
  - *All Lectures in the Ashton Building Lecture Theatre*
  - Monday 11:00
  - Wednesday 09:00
  - Thursday 14:00
- Lab Classes:
  - Formal Labs (with exercises) weekly at 4pm Thursdays
    - Commence in Week 3 in Mac Lab (Lab 4, Holt Building)
  - Lab 4 is reserved for COMP327 all day on Mondays
    - Good for independent study, extra lab times, etc

Recommended Texts

- ***Ubiquitous Computing: SmartDevices, Environments and Interactions.***
  Stefan Poslad (Wiley, 2009)

- ***Pervasive Computing: The Mobile World***
  Uwe Hansmann, Lothar Merk, Martin S. Nicklous, Thomas Stober
  (Springer Professional Computing, 2003)

- ***M-Commerce***
  Norman Sadeh (Wiley, 2002)

- ***Beyond 3G: Bringing Networks, Terminals, and the Web Together***
  Martin Sauter (Wiley, 2009)

Module Assessment

- Assessment is through two components:
  - Two implementation-based courseworks, worth 20% of the final mark.
    - These coursework components (worth 10% each) are Mac-based, and require development on an Intel-based Apple Mac platform.
  - A written exam will take place at the end of Semester 1, worth 80% of the final mark.
    - ***Note - all of material covered by the module is relevant, and thus any of it could appear in the exam...!***

Lab Classes

- Lab Classes will be held regularly in the Mac Lab (Lab 4, Holt Building)
    - Thursday - 4pm from Week 3
- Lab Slots will also be available all day every Monday, to explore the iPhone / iPod Touch development environment.

All practical work is Apple Mac based!

Resources

- Printouts of the lecture notes will be available from the Computer Science Helpdesk
    - This is a new module, and will evolve as the module proceeds. Whilst we will strive to get notes on the web prior to each lecture, **printed notes will generally only be available after** each lecture, and may vary slightly from the slides delivered in the lectures.
- Video Tutorial Resources and other documentation will also be available on the Macs in the Mac Lab
- Links to emerging relevant news articles will appear on the module web site

Expectations

- The field of Mobile Computing is rapidly evolving
  - There may be an element of discussion during some lectures, based on emerging news items
  - Exams and Exercise questions rely on **understanding** and **applying** much of the material in this module.

    Don't rely on simply remembering the notes, as this won't help you pass...!

Finally...

- The obvious...
  - Switch off all mobile phones during lectures
  - Do not sign the register on behalf of others
  - Attend lectures and attempt the exercises set - this will help you pass the exam
  - Attend the practical classes - these will help you do the coursework
  - Ask questions if there is anything that you do not understand
- And respect your fellow students...
  - There are people here who want to learn!
  - If you want to talk or mess around, then don't bother attending!