Aspects of Pervasive Computing
Week 1: Introduction

Honours Subject (Sem2, 2003)
School of Information Technologies

Tue 10-12 : Carslaw 452

Today’s Lecture

- Administration
- Overview
- CRC-Smart Internet Technology
- Literature Survey
Instructors

◆ Academic staff
  ■ Judy Kay
  ■ Bob Kummerfeld
  ■ Josiah Poon
  ■ Aaron Quigley

◆ and YOU ...

Teaching Arrangements

◆ Block-mode
  ■ 4 blocks
  ■ Each block has a central theme
  ■ Each block span over 3 weeks
  ■ Each block consists of
    • Overview by staff
    • Paper presentation, critique & discussion led by students
    • Project discussion
    • Discussion on Assignment 2
The Four Blocks (1)

- Infrastructure
  - IE: Intelligent Environment
  - Context Awareness
  - Resource Discovery

- Soft Issues
  - Methodology
  - Software Engineering
  - Social Issues

- Novel Interfaces
  - Visual, gestures, tactile etc
  - Wearables
  - Emotion

- Personalisation
  - SPA: Smart Personal Assistant
  - User Models
  - Just-in-time Systems
  - Engineering Personalised Systems

Week 1: Overview

Week 2-4: Infrastructure

Week 5-7: Interfaces

Week 8-10: Soft Issues

Week 11-13: Personalization

The Four Blocks (2)

- Bob & Aaron
  - IE: Intelligent Environment
  - Context Awareness
  - Resource Discovery

- Aaron
  - Visual, gestures, tactile etc
  - Wearables
  - Emotion

- Josiah
  - Methodology
  - Software Engineering
  - Social Issues

- Judy
  - SPA: Smart Personal Assistant
  - User Models
  - Just-in-time Systems
  - Engineering Personalised Systems

- Overview by staff
- Paper presentation, critique & discussion
- Project presentation & demo
### Assessment

<table>
<thead>
<tr>
<th>Literature Presentation</th>
<th>9%</th>
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</thead>
<tbody>
<tr>
<td>Presenter</td>
<td></td>
</tr>
<tr>
<td>Commentator: Critique &amp; Lead the discussion</td>
<td>6%</td>
</tr>
</tbody>
</table>

#### Assignment 1: Team-Based Project
- Project Proposal - Week 4 (10%)
- Interim Report - Week 8
- 10-page Conference Paper - Week 12 (30%)
- Final Presentation - Week 13 (10%)
- Poster - Week 13 (10%)

#### Assignment 2: Week 14 - 6 Nov (Wed) 4pm
- A PhD proposal in the area of Pervasive Computing which are of interests to the CRC-Smart Internet

| Total                                    | 100% |

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### Marking Criteria for Literature Presentation

**Content – 60%**
- Able to accurately report the content of the paper concerned
- Able to highlight the core contributions

**Additional Material – 25%**
- Able to include additional material/information from the authors’ other papers

**Presentation Skill – 15%**
- Quality of the slides
- Able to draw the attention of the audience etc...
### Marking Criteria for Literature Critique

- **Critique – 60%**
  - Extent – on scope, assumptions, limitations, experiments, discussion ...
  - Validity
  - Offering of alternatives
  - Materials used
- **Presentation Skill – 25%**
  - Quality of the slides
  - Able to draw the attention of the audience etc...
- **Leading the Discussion – 15%**

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### Marking Criteria for Assignment 1

- **Project Proposal Presentation – 10%**
  - Innovation
  - Relevance
  - Background study
- **Interim Report**
  - 2 pages.
  - No marks. But it is used to scale the 10-page conference paper.
- **10-page conference paper – 30%**
  - Pretend you are asked to write up your project and submit to the Conf. of Pervasive Computing
  - Format:
- **Final Demo & Presentation – 10%**
- **Poster – 10%**
Projects List for Assignment 1

- **Aaron**
  - user interfaces for invisible and embedded computing
  - software engineering principals for pervasive computing
  - nymity and the control of identity

- **Judy**
  - personalised system
  - Just-in-time system

- **Josiah**
  - control of slide presentation using speech & gesture
  - “Are you in office?” – a computer-supported awareness system

Assignment 2

- A 10-page report describing a PhD proposal relevant to the CRC-Smart Internet.

Including
- Aims & Significance of the Project
- Related Work
- Methods & Techniques
- Research Plan
- Risk Analysis
## Marking Criteria for Assignment 2

<table>
<thead>
<tr>
<th>Marks distribution</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance of the Project</td>
<td>10%</td>
</tr>
<tr>
<td>Critical analysis of the related work</td>
<td>30%</td>
</tr>
<tr>
<td>Methods &amp; Techniques (novelty...)</td>
<td>50%</td>
</tr>
<tr>
<td>Clarity in Presentation</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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**Names, names and names...**

- Pervasive computing
- Ubiquitous computers
- Information appliances
- Invisible computing
- Wearables
What is it about?

- Move from foreground to background
- Different UI required
  - Age of calm technology
    - Relax the user but, by moving unneeded information to the edge of an interface, allow more information to exist there, ready for selection when needed
- Proactive
- Make use of contextual information
- Personalisation
- Wide range of computer science fields: networking, user interfaces, distributed systems, security, databases

Issues and Enablers

- Internet Everywhere
- Interconnectedness
- Awareness
- Pervasive Computing
- Multi-devices
- Embedded Technology
- New User Interface
- Management
- Voice Recognition
- Haptic Interface
- Biometrics
- Privacy
- Information Exchange
- XML etc.
Example of Active Projects

- **Project Oxygen** (MIT)
- **The Aware Home Project** (Georgia Tech)
- **CoolTown** (HP)
- **Intelligent Room** (MIT – AI Group)
- **Easy Living** (Microsoft)
- **Ambient Project** (DSTC)

CRCSIT

- **Cooperative Research Centre – Smart Internet Technology**
Doing the Literature Survey  (1 of 2)

- Start with a few papers
- Work from the References
  - Identify more papers
  - Identify key players: people & research groups
- Using web
  - Search Engines
  - CiteSeers
  - ACM Digital Library
  - IEEE
- Using library

Doing the Literature Survey  (2 of 2)

- Asking
  - Newsgroups
  - Key people
- Journals, conferences, technical reports
  - Working from the existing papers again
What to do with the papers?

◆ Read (of course)
◆ Note what they have done → strength
◆ Find the gap → weakness
  ■ Note the explicit constraints & scope of projects
  ■ Identify implicit assumptions,
    • e.g. certain domains, systems, specific type of data ...
  ■ How did the authors evaluate their system?
    • Appropriate? Enough? Valid? Correct interpretation?
◆ Summarise the gaps
  ■ That is where you can contribute
  ■ Identify a subset of gaps where you will work on

Some Good Reading

◆ Mark Weiser, The Computer for the Twenty-First Century, Scientific American, pp. 94-10, September 1991 (html)
◆ Towards a Better Understanding of Context and Context-Awareness (abstract, pdf, postscript)
  Anind K. Dey and Gregory D. Abowd.