Today

• Why write a paper?
• When to write a paper?
• Types of papers
• How to write a paper?
  – how to write an abstract?
• Where to send it?
• Co-authorship
• Refereeing
• Some practical advice
Why write a paper?

- Science is all about reporting on research
  - A contribution only exists if *and only if* it is documented
- Eating the elephant in smaller pieces
  - focus on a specific contribution
  - rather than telling the whole story
- The main component in your CV
  - and hence for your future (academic) career
- The main source for your peers to get to know you
  - the best way to be famous is from your work
- Work as a way into internships, etc.
- In Denmark – may be the parts making up your thesis
When to write a paper

- When you have something important to share with others
  - a new idea
  - new data
  - an intelligent review of existing work

- Mature results
  - research milestone completed
  - can articulate the results
    - clear problem statement, solution, and contribution
Types of papers I

• Review paper
  – a survey of a specific area, technology, methods, etc.
  – you need to do this anyway
  – can be published

• Analysis paper
  – workplace study
  – theoretical analysis
  – technical analysis, comparison, or review

• Design paper
  – a new technical design
  – user interface techniques / UI design / Interaction Design
  – software architecture
  – ...

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### Table 1. Current location sensing technologies.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Technique</th>
<th>Physical</th>
<th>Symbolic</th>
<th>Absolute</th>
<th>Relative</th>
<th>LLC</th>
<th>Recognition</th>
<th>Accuracy and precision if available</th>
<th>Scale</th>
<th>Cost</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS</td>
<td>Radio time-of-flight location</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>1-5 meters (95-99 percent)</td>
<td>1-5 meters worldwide</td>
<td>Expensive infrastructure, $100 receivers</td>
<td>Not indoors</td>
</tr>
<tr>
<td>Active Badges</td>
<td>Diffuse Infrared cellular proximity</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>Room size</td>
<td>1 base per room, badge per base per 10 sec</td>
<td>Administration costs, cheap tags and bases</td>
<td>Sunlight and fluorescent light interfere with infrared</td>
</tr>
<tr>
<td>Active Bats</td>
<td>Ultrasound time-of-flight location</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>9 cm (95 percent)</td>
<td>1 base per 10 square meters, 25 computations per room per sec</td>
<td>Administration costs, cheap tags and sensors</td>
<td>Required ceiling, sensor grid</td>
</tr>
<tr>
<td>MotionStar</td>
<td>Scene analysis, location</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>1 mm, 1 ms, 0.1° (nearly 100 percent)</td>
<td>Controller per scene, 106 sensors per scene</td>
<td>Controlled scenes, expensive hardware, Control unit tether, precise installation</td>
<td></td>
</tr>
<tr>
<td>VHF</td>
<td>Angulation</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>1° radial (≈ 100 percent)</td>
<td>Several transmitters per metropolitan area</td>
<td>Expensive infrastructure, inexpensive aircraft receivers</td>
<td>30-40 nautical miles, line of sight</td>
</tr>
<tr>
<td>Cricket</td>
<td>Proximity, location</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>4 × 4 ft. regions (≈ 100 percent)</td>
<td>1 beacon per 16 square ft</td>
<td>$10 beacons and receivers</td>
<td>No central management receiver computation</td>
</tr>
<tr>
<td>MSR RADOAR</td>
<td>Scare analysis and triangulation</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>3-3.4 m (50 percent)</td>
<td>3 bases per floor</td>
<td>802.11 network installation, = $100 wireless NICs</td>
<td>Wireless NICs required</td>
</tr>
<tr>
<td>PinPoint 3D-ID</td>
<td>RF location</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>1-3 m</td>
<td>Several bases per building</td>
<td>Infrastructure installation, expensive hardware, Proprietary, 802.11 interference</td>
<td></td>
</tr>
</tbody>
</table>

• Systems paper
  – describe a system / piece of technology
  – Proff-of-Concept
• Theoretical paper
  – Proves some properties ...
• Evaluation paper
  – Technical evaluation
  – Usability evaluation
  – Pilot study
• Methods paper
  – a new method / methodology for ...
  – new process
• Position Paper
  – a statement / critical message
  – normally not considered a contribution
How to write a paper?

• Find the contribution
• Outline Related Work
• Identify and engage co-authors
• Identify the readers / target outlet
• Ensure validity
• Ensure quality
• Write good English
• Proofread
• Submit
• Revise
A Scientific Contribution I

- Adds to "knowledge"
  - thus it must be a **written** contribution
  - and not only something you did
  - what can others learn from this

- Typically addresses a clear stated problem
  - and explains well, what is new
  - the "delta" to existing work

- Relevance of a scientific contribution - some metrics
  - relates to the relevance of the problem
  - relates to the #citations
  - relates to the publication
    - the kind (workshop, conference, journal)
    - the ranking of the conference/journal
Learn the “Game”

- What is the “standard” paper in our area?
  - HCI
    - needs a user involved somehow – design & evaluation
- Workplace studies
  - needs a non-trivial field study
- Systems papers
  - needs an implementation and some evaluation
    - good: used by others
    - better: used by others to build something
- Theoretical papers
  - a proof of something
The “Introduction”

- **Background**
  - Motivation – a real issue?
  - What is the research context?
  - What is the state-of-art?

- **Hypothesis / Problem**
  - What is broken/missing (the “gab”)
  - Thesis or Problem statement

- **Goals and methods**
  - What are the operational goals of this paper?
  - And how were they achieved?

- **Results**
  - Contributions

- **Paper overview**
  - Outline of the rest of the paper

*Source: Saul Greenberg’s homepage.*
Main body + Conclusions

• Main body
  – Section organization reflects how your argument unfolds
  – Each section should have a main point
  – Each paragraph should have a main point

• Summary/Conclusions
  – Tell them what you’ve told them
    • some people only read abstract, intro and conclusions
  – Relate back to general area
  – Introduce future work
How to make the “Abstract”

• 1st model ~ systems kind of papers
  – Background
  – However, gab
  – What we did ~ innovation
  – Contributions
  – What it means

• 2nd model ~ study/medical kind of papers
  – Background & Purpose
  – Methods
  – Results
  – Conclusions
Support for Activity-Based Computing Operations

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Centre for Pervasive Health
Aabogade 34, 8200
{bardram, jbp, mad

ABSTRACT
Research has shown that computers are notoriously bad at supporting the management of parallel activities and interruptions, and that mobility increases the severity and scope of these problems. This paper presents activity-based computing (ABC) which supplements the prevalent data- and application-oriented computing paradigm with technologies for handling multiple, parallel and mobile work activities. We present the design and implementation of ABC support embedded in the Windows XP operating system. This includes replacing the Windows Taskbar with an Activity Bar, support for handling Windows applications, a zoomable user interface, and support for moving activities across different computers. We report an evaluation of this Windows XP ABC system which is based on a multi-method approach, where perceived ease-of-use and usefulness was evaluated together with rich interview material. This evaluation showed that users found the ABC XP extension easy to use and likely to be useful in their own work.

Background & Gab
What we did ~ Innovation
Contributions
Method
Results
ABSTRACT

The role of computers in the modern office has divided our activities between virtual interactions in the realm of the computer and physical interactions with real objects within the traditional office infrastructure. This paper extends previous work that has attempted to bridge this gap, to connect physical objects with virtual representations or computational functionality, via various types of tags. We discuss a variety of scenarios we have implemented using a novel combination of inexpensive, unobtrusive and easy to use RFID tags, tag readers, portable computers and wireless networking. This novel combination demonstrates the utility of invisibly, seamlessly and portably linking physical objects to networked electronic services and actions that are naturally associated with their form.
Exercise

Try to write an abstract for a paper describing the invention of the paper clip
Where to Publish?

• Workshops
  - Good for practice
  - Good for networking
  - Not archival,
  - Limited peer-review

• Conferences
  - BEWARE! Quality varies a lot
  - ACM, IEEE Conferences (Springer)
  - Archival
  - Peer-reviewed

• Journals
  - Look for top-rated journals (ACM, IEEE, Elsevier, ...)
  - Publish in the green-listed journals (Danish)

• National publication ...
Co-authorship

THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

The first author
Senior grad student on the project. Made the figures.

The second author
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

The third author
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is “fair”.

The second-to-last author
Ambitious assistant professor or post-doc who instigated the paper.

The middle authors
Author names nobody really reads. Reserved for undergrads and technical staff.

The last author
The head honcho. Hasn’t even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

Co-authorship – Simple Rules

• All authors should have contributed
  – to the research
  – to the paper

• Always try to put your professors name on
  – forces him/her to work with you
  – if “only” advising, put the name last

• Make sure to invite everybody who at some point made a contribution
  – initial ideas
  – coding
  – evaluation
Refereeing
Refereeing

• Just overhead?
  – your professor hand you all his papers...

• Refereeing is excellent practice for
  – developing critical appraisal skills
  – understanding how good (and bad) papers are written

• Fairness
  – all your papers will be refereed
  – expected duty of all researchers/academics

• Other upsides
  – enhance reputation
  – expedites processing of your own papers
  – get on editorial board or program committee
  – 'previews' to the state of the art

Source: Saul Greenberg’s presentation on refereeing, “HowToReferee.ppt” from his homepage.
The Piled Higher & Deeper

Paper Review Worksheet

Stuck reviewing papers for your advisor? Just add up the points using this helpful grade sheet to determine your recommendation.

No reading necessary!

<table>
<thead>
<tr>
<th>Paper title uses witty pun, colon or begins with “On…” (+10 pt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper has pretty graphics and/or 3D plots (+10 pt)</td>
</tr>
<tr>
<td>Paper has lots of equations (+10 pt) (add +5 if they look like gibberish to you)</td>
</tr>
<tr>
<td>Author is a labmate (+10 pt)</td>
</tr>
<tr>
<td>Author is on your thesis committee (+60 pt)</td>
</tr>
<tr>
<td>Paper is on same topic as your thesis (-30 pt)</td>
</tr>
<tr>
<td>Paper cites your work (+20 pt)</td>
</tr>
<tr>
<td>Paper scooped your results (-1000 pt)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Points</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0</td>
<td>Recommend, but write scathing review that’ll take them months to rebuff.</td>
</tr>
<tr>
<td>0-120</td>
<td>Recommend, but insist your work be cited more prominently.</td>
</tr>
<tr>
<td>&gt;120</td>
<td>Recommended and deserving of an award</td>
</tr>
</tbody>
</table>

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A Template for Reviewing

• Meta information
  – paper title, author (if not ann.), manuscript id, ...

• The review
  – brief summary (2-3 lines)
  – “If you can’t, there is probably something wrong with the paper” [ACM CHI FAQ]
  – Contribution
    • what is new? is it significant? (novelty/contribution)
    • would it stimulate further work? (impact)
    • how relevant is it to the community? (relevance)
  – Quality of the research
    • how sound is the work?
    • how appropriate/reliable are the methods used?
    • how reasonable are the interpretations?
    • how does it relate to existing work?
    • can an experienced practitioner in the field duplicate the results?
  – Quality of the writing
    • outline, language, spelling, grammar, figures, ...
  – Recommend acceptance / rejection
Receiving reviews

**ADDRESSING REVIEWER COMMENTS**

**BAD REVIEWS ON YOUR PAPER? FOLLOW THESE GUIDELINES AND YOU MAY YET GET IT PAST THE EDITOR:**

**Reviewer comment:**
“*The method/device/paradigm the authors propose is clearly wrong.*”

**How NOT to respond:**
* “Yes, we know. We thought we could still get a paper out of it. Sorry.”

**Correct response:**
✓ “The reviewer raises an interesting concern. However, as the focus of this work is exploratory and not performance-based, validation was not found to be of critical importance to the contribution of the paper.”

**Reviewer comment:**
“*The authors fail to reference the work of Smith et al., who solved the same problem 20 years ago.*”

**How NOT to respond:**
* “Huh. We didn’t think anybody had read that. Actually, their solution is better than ours.”

**Correct response:**
✓ “The reviewer raises an interesting concern. However, our work is based on completely different first principles (we use different variable names), and has a much more attractive graphical user interface.”

**Reviewer comment:**
“*This paper is poorly written and scientifically unsound. I do not recommend it for publication.*”

**How NOT to respond:**
* “You #%&@*% reviewer! I know who you are! I’m gonna get you when it’s my turn to review!”

**Correct response:**
✓ “The reviewer raises an interesting concern. However, we feel the reviewer did not fully comprehend the scope of the work, and misjudged the results based on incorrect assumptions.”

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Practical Advice
Some final practical advice

• **Copycat**
  – find a very good* paper and literally copy it word by word, sentence by sentence, section by section
  – *: good in terms of writing – not contribution

• **Learn from others**
  – write together with others – e.g. your supervisor
  – read and review other’s papers

• **Learn to write English**
  – take classes
  – spend time on writing – it is time consuming
  – build your (scientific) vocabulary
    • pick up phrases and words from others

• **(Try to spilt a paper in two)***
• Saul Greenberg’s homepage
  - http://pages.cpsc.ucalgary.ca/~saul

• "So long, and thanks for the Ph.D.!!"
  - a.k.a "Everything I wanted to know about C.S. graduate school at the beginning but didn't learn until later."

• http://www.phdcomics.com/

• ... and a lot of other resources!
Oh no, your paper exceeds the maximum number of pages allowed! What do you do??

**TIPS AND TRICKS**
FOR KEEPING YOUR PAPER WITHIN THE PAGE LIMIT

- **Shrink font size to limits of human perception**
  If a minimum font size is imposed, use a font that is 0.2pt smaller. They won't notice, will they?

- **Take out excessive details of your methodology**
  Let's face it, nobody really cares (and if they do, why help your competition?)

- **Border size Rule-of-thumb:**
  If there is paper exposed, it can be filled (Nature, and other journals, abhors a vacuous submission).
  If limit exists, apply 0.2pt rule.

- **Use Max. Abbrev. in Ref. Sec.**
  Spelling out the journal names will only make it easy for people to look up your competitors' papers.

- **Rewrite entire paper to make it more concise and easier to understand**
  Yeah right. Prodigious verbiage establishes your superior intelligence. Also, who has the time?

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