Feedback on talks

• Very good so far, well done
• Speak to the audience where possible
• Make the best use of the time but be careful about running over, I will get more strict
• Presenting a plan at the start is not needed but some signposting of what to come may help
• Final slide – help discussion, not cute clipart
• Careful about font size: Figures should be re-drawn preferably, same applies for demos
• I’m not going to suggest dressing in any particular way but do bear this in mind for professional talks
Feedback on paper summaries

- Summarise the paper concisely and then focus on discussing the content
- No need to describe structure of the paper explicitly or implicitly
- Be specific, rather than general
  - Make every word count
- Specify “why” where possible
- Saying a paper is easy to understand is critical analysis but only quite a superficial form
Critically Reviewing the Literature

• Questions to ask yourself
  • If relevant, does it follow the scientific method?
  • Is the method used appropriate?
  • Are the results valid?
  • Do the conclusions make sense given the findings and existing work?
  • Has this study been cited by others?
A Good Literature Review

• Begins with a well formed research question
• Explores the research question
  • What work has previously addressed this question?
  • What aspects of the problem are still unknown?
  • What have others argued?
  • What needs to be done?
  • How does this affect practitioners and theorists?
• Is founded on existing & accepted theories
  • Is not simply a list of URLs
A Good Literature Review

• Locates all relevant literature
• Has a logical structure - structured by
  • Themes
  • Time
  • Experiments/trials
  • Different research approaches
  • etc
• Critically reviews the literature
  • Not just a simple catalogue of the literature
• Justifies the reason for the research
Citations are important!

- Bedrock of academic honesty
- Avoids claims of plagiarism
Citations

- Students often get citations wrong
  - Over cite, under cite or not cite at all
  - Reader can’t see an obvious research trail
  - Quoting irrelevant sources
  - Too few or too many references
  - Wrong or mixed citation styles
  - Difficult to locate referenced sources
  - Bibliography mainly consisting of URLs
  - Forgetting page reference on quotes
Citations

- Must not copy text, ideas, analyses, etc. unless source is clearly indicated
- Must make it clear where you have used, or referred to, others’ work/ideas/comments
  - If in doubt, cite!
- Reader should be able to locate your sources
  - Some journals only allow publicly available works to be referenced
- Refer to your sources unambiguously
Citations

• Use citations when
  • Quoting verbatim
    • e.g. In their study Smith et al. (2006, p.26) concluded, “ [...] people generally ignore security warnings, if they believe there is no immediate or obvious danger to them”
  • Referring to existing research, particularly in the related work (literature review) section of a paper
    • e.g. Although people’s actual behaviour has previously been found to be non-privacy protecting [10,45,56], this may be because of poor user interfaces [23,30], or users’ goal-driven behaviour [15,21,29]
  • Use to build your “state of the art” argument
Citations

- Use citations when
  - Indicating that work or idea is by someone else
  - Paraphrasing
    - Same meaning but different words
    - e.g. Peoples’ stated privacy preferences do not match their actual privacy behaviour (Norberg et al., 2007)
  - When copying a figure, graph, or table (beware copyright)
  - There is background material you believe the reader may wish to refer to
  - Other reasons to refer to work outside your paper
Citations

• No need to cite when
  • You have discovered the facts yourself
  • It is an original idea, theory etc.
  • It is common knowledge
    • e.g. electromagnetic radiation which can be seen by the human eye is known as visible light
  • Sometimes hard to define “common knowledge"
Citations

• Good citing is almost an art – no single rule
  • Experience in writing and reading papers will help you
• Two mandatory components of a citation:
  • In the text itself
  • In the reference list
• The reference list may be
  • At the end of the paper (bibliography)
  • As footnotes (common approach for legal articles)
Citations

• Citations may look like
  • “Previous experiments indicate a possible link (Smith et al., 2006)”
  • “Previous experiments indicate a possible link [1]”
  • “Previous experiments indicate a possible link [SBW06]”

• Many different citation styles

• Generally two types
  • Author-date - e.g. (Jones, 2006)
  • Numeric - e.g. [1]
  • But there are others – e.g. [MS12]
Citation Styles in Zotero

Zotero Style Repository

Here you can find Citation Style Language 1.0.1 citation styles for use with Zotero and other CSL 1.0.1-compatible software. For more information on using Zotero, please refer to the Zotero user guide.

Style Search

<table>
<thead>
<tr>
<th>Format:</th>
<th>author</th>
<th>author-date</th>
<th>label</th>
<th>note</th>
<th>numeric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fields:</td>
<td>anthropology</td>
<td>astronomy</td>
<td>biology</td>
<td>botany</td>
<td>chemistry</td>
</tr>
<tr>
<td></td>
<td>engineering</td>
<td>generic-base</td>
<td>geography</td>
<td>geology</td>
<td>history</td>
</tr>
<tr>
<td></td>
<td>linguistics</td>
<td>literature</td>
<td>math</td>
<td>medicine</td>
<td>philosophy</td>
</tr>
<tr>
<td></td>
<td>psychology</td>
<td>science</td>
<td>social_science</td>
<td>sociology</td>
<td>theology</td>
</tr>
</tbody>
</table>

6,780 styles found:

- 3 Biotech  (2013-05-10 09:45:15)
- 4OR  (2013-05-10 09:45:15)
- Academic Medicine  (2013-03-29 23:50:45)
- Academic Question  (2013-05-10 09:45:15)
- Academy of Management Journal  (2013-05-10 09:45:15)
- Accident Analysis and Prevention  (2013-05-10 09:45:15)
- Accounting Forum  (2013-05-10 09:45:15)
- Accounting History  (2013-05-10 09:45:15)
- Accounting, Organizational, Social and Management History  (2013-05-10 09:45:15)
- Accounts of Chemical Research  (2013-05-10 09:45:15)
- Accreditation and Compliance Management  (2013-05-10 09:45:15)

• Make sure you pick the correct citation style for the journal, conference etc. you are submitting to
• Using a bibliographic tool like Zotero you can switch between citation styles very quickly
  • www.zotero.org
• Generally, in UCL Computer Science assignments citations are numeric, e.g. [1], or hybrid, e.g. [SJ02]
Goals of citations

- Shows reader you have carried out a thorough literature survey
- Makes reader more likely to view the results of your study seriously/favourably
- Shows respect for the ideas of others
Poor Research Design

What research problem can I think of, which involves a user study and would use my security software?

• What is wrong with this approach?
Research Design in Context

- Remember to follow the scientific method
  - Identify the research problem
  - Specify purpose of research
  - Determine hypotheses/research question
  - Carry out a literature review
  - **Determine best research method**
    - Study, develop software, mathematical proof
  - Carry out research - data collection
  - Analyse data
  - Report results
  - Draw conclusions from research
  - Adjust theory
Research Types

• Primary research
  • Using primary sources and/or data
  • Often used by historians – e.g. studying ancient documents
  • Analysis of raw data from existing or new studies

• Secondary research
  • Using secondary sources
  • Synthesis or analysis of existing discussions of primary sources
  • Case studies
  • Meta-analyses
  • Literature survey
Qualitative Research

- Often a fairly broad research question
- Good for exploratory research
- Address questions about human behaviour
- Data collected is usually word-type
- Used in social and management sciences
Qualitative Research

- Not quantifiably measuring variables
- Not looking for relationship between variables
- Expensive and time consuming to undertake
- Usually small sample sizes
NVivo
NVivo
Atlas TI
Quantitative Research

• Narrow research question
• Empirical investigation of quantitative properties and their relationships
  • Need to clearly identify variables for experiment
  • Different types of variables (see later slides)
• Data collected is numeric
Quantitative Research

- Data analysed with statistical methods
  - Correlations, regression, means, standard deviations, chi-square ($\chi^2$) for categorical data etc.
- Looking for relationships between variables
  - Correlation and causation
Tools for quantitative research

• Excel
  • Dangerous: easy to make errors, scales poorly, limited number of techniques

• R
  • Excellent set of libraries connected to mediocre programming language

• Python
  • Good set of libraries connected to good programming language

• Julia
  • Promising approach, but still in rapid development
Repeatability in analysis

• Repeatability is just as important in analysis as it is in performing experiments
• Tools can help here
• Minimum requirement: version control (e.g. Git, Subversion, Mercurial, Bazaar)
• Strongly recommended: tool to manage experimental runs: e.g Sumarta, Vistrails
  • Logs what tools were run and from where output came from (version and parameters)
Mixture of Methods

• Possible study #1
  • Code transcripts from focus groups (qualitative)
  • Answers from a survey (quantitative)
    • Categorical variables e.g. age, education
  • Investigate relationship between categorical variables and codes from transcripts
    • Chi-square analysis

• Possible study #2
  • Q methodology – identify different viewpoints
  • Participants order statements - “Q-sort”
  • Results of Q-sort undergo factor analysis