Student Conference in Computing Science

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http://www8.cs.umu.se/kurser/5DV144/HT14/
Overview

● Your next deliverable (D2)
● How to do research (!)
● Literature
  – Searching for literature
  – Reading the literature
● Writing
  – Structure of a research paper
  – Referring to others work
  – Guidelines for writing
  – Latex overview
● What to do now!
After (approved) topic selection
- research the field (literature research)
- outline your paper
- document literature research in an annotated bibliography
- deliver D2 (outline and annotated bibliography) at latest October 8, 12:00 via EasyChair in required format (LaTeX)
How to do Research

● Define a specific research question (topic selection)
● Make a research plan with concrete (sub)goals:
  − Search for literature, read and think
  − Do the “real” research: develop, implement, prove, experiment, conduct user tests, evaluate, draw conclusions, …
  − Write
● Execute the plan
  − Not always linearly
  − Modify the plan and/or hypothesis/question if necessary
  − There is no recipe!
● Finalize your paper, publish results
● Discuss and exchange ideas (conferences!)
Searching for Literature (1)

Why?

- To learn about an area
  - What is interesting and important (for others!)
  - What has/has not been tried?
  - What is suggested to be tried?
- To be able to come up with new things!
- Research builds on earlier work!
  - “Standing on the shoulders of giants”
  - You must give references to related work on
    - the relevance of the problem
    - related problems and solutions
    - your used tools and methods
Searching for Literature (2)

Where?
- Search engines (Google, etc.)
- Specific literature databases or search engines
  - Google Scholar (motto: "Stand on the shoulders of giants"), Scirus from Elsevier, CiteSeerX, getCITED, INSPEC
  - Check out www.ub.umu.se
- Physical library (not everything is available online!)

How?
- Search for topics, keywords, authors, ...
- Focus on publications (.pdf)
- Browse the publications
  - Introduction, abstract
  - Look in the reference section!
- Surveys (recent!) can be excellent
- Identify key authors in the area - Google for more info
Searching for Literature (3)

Avoid “Blind” Trust

- Critically evaluate your sources
- Try to see the difference between
  - Facts & interpretations of facts
  - Original work & (mis)interpretations
    - Check primary sources if possible, avoid secondary (and higher order) sources
  - Seriousness (high quality) & sloppiness (low quality)
  - Science & pseudoscience
- Prefer resources that apply a peer review system
  - Home pages, company web sites, on-line magazines, Wikipedia, etc. are not trustworthy
● The purpose of searching!
● Reading and literature search are intertwined
● You can’t read everything
  − Try to spend your time on relevant and good papers (hard to know in the beginning …)
● Make notes using your own words
  − What is interesting and important?
  − What has/has not been tried/examined?
  − What is suggested to be tried/examined?
  − Your own ideas
  − Critical comments and explanations
  − Relate to other information
⇒ This results in the annotated bibliography
Bibliography:
A set of publications related to a given subject

To annotate:
To add comments (annotations) or explanations

- Annotated bibliography = commented reference section: year, author, title, publisher, comments
- Comments ≠ Abstract
- Useful for keeping track of your readings and comments/thoughts
- Useful for your writing
Types of Research Papers

- Experimental results
  - Studying natural systems
- Formal constructions
  - Algorithm development, proofs, ...
- Evaluation/comparison
  - User tests
- Survey

They all have different styles
Typical Structure of a Paper

- Title and author
- Abstract – summarizes the paper
- **Introduction**
- ...
- ...
- **Discussion/Summary/Conclusion**
  (choose what fits best)
- References

**MAIN SECTIONS**
headings and subheadings
must fit YOUR TOPIC.
Writing the Outline

- Make sure you know what you are going to do
  - Summarize relevant background and context
  - Refine your question/hypothesis/statement
- Write section- and subsection headers
- Write some raw text for each section and subsection
- Add “reminders” for the things you plan to write (e.g., in bullet list form)
- Add appropriate citations and references
- The intermediate result will be presented and discussed at the peer review meetings

Read and use the LaTeX template (demo.tex) on the homepage
The Introduction

- Should present
  - The problem investigated:
    - What, Why
  - Review of relevant earlier work – incl. references
    - Other approaches
    - your used techniques
  - Your chosen approach/technique
    - What, Why
  - Major results and conclusions!
    - “Reading a scientific article isn’t the same as reading a detective story. We want to know from the start that the butler did it” (Ratnoff, 1981)
- Start writing the Introduction while your work is still in full progress [1]
  - You have it all fresh in your mind
  - The writing may reveal inconsistencies in your work
The Discussion

- Main components (also see [1])
  - Discuss (do not repeat) main results
  - Point out exceptions where the results don’t apply
  - Show how results match previously published work (can also be in the introduction)
  - Discuss the consequences of the results
  - State and motivate your conclusions as clearly as possible

- Avoid the Squid technique (Doug Savile, 1972): “The author is doubtful about his facts or his reasoning and retreats behind a protective cloud of ink”
Why using references?

- show the relevance of the topic/question
- distinguish between yours and others' ideas
- give other authors credit for their work
- direct the reader to relevant sources of information
- show that you know the area of research
- give evidence for your claims
References

- The list of other work, placed at the end of the paper (the Reference section):
  - year, author, title, publisher, ...

Citations

- Abbreviations that refer to entries in the Reference section

Examples:
“A comparison of similar methods can be found in Ref. [3]. Johns et al. [7] refer to SPVS as one of the best methods.”

References


Quoting (1)

Referring to other’s work by including (parts of) it

- We normally use our own words when citing other work:
  
  Research in cognitive science shows the importance of detailed and situated narratives (Carroll et al., 1994).

- Quotations are used if the wording itself is of particular interest or if you want to present a position you will argue or comment on

- The original text must be repeated exactly as in the source:
  
  “Recent theory and methodology in cognitive science clearly reflects a growing and broadening awareness of the importance of detailed and situated narratives” (Carroll et al., 1994, p 245).
Quoting (2)

- Quoting figures, tables, video, audio, etc. in your material requires permission from the copyright holder.
- A reference alone will not do.
- This also holds for your own publications (self-plagiarism).
- Even public domain material (e.g., under Creative Commons) requires creator, source, and type of license to be pointed out.
- Anything else is plagiarism and/or copyright infringement.

THIS IS A SERIOUS WARNING!
All cases of suspected plagiarism will be forwarded to the disciplinary board – no exception!
References (5)

Plagiarism

“... re-use in one paper of material that has appeared in another, without appropriate acknowledgement.”

(Zobel, 2004, p 217)

Possible reasons
- Misjudgment (by an inexperienced researcher)
- Carelessness
- Deliberate theft

The reason is irrelevant

Also applies to your previous publications!

Ask supervisors and check homepage for examples
How to Cite (1)

- There are many common formats for citation marks
  - Number styles:
    - [1], [2–4], or the like
  - Harvard style:
    - (Björk, Knight & Wikborg, 1988), (Carroll et al., 1994; Holtom & Fischer, 1999; Zobel, 1997), ...
  - “Abbreviation” style:
    - [BKW 88], [Car+ 94, HoFi 99, Zob 97], ...
  - APA style, MLA style, ...
- Depends on the journal, conference, etc.
- BIBTeX does the formatting for you.

We will use this style
How to Cite (2)

- Citation marks are placed inside the sentence, as
  
  We use Parikh’s Theorem [12] to prove the result.

  We use Parikh’s Theorem to prove the result [12].

- Wording is important. Compare
  
  - According to [5], design should follow function.
  - In [5], it is claimed that design should follow function.
  - Design should follow function [5].
What to Cite (1)

- Trustworthy and objective sources
  - Peer reviewed publications
  - Books
  - Technical reports
  - **No** sales/marketing brochures
  - Prefer primary sources
    - Be careful with secondary sources
    - Be precise about who said what

References (8)
What to Cite (2)

- Do not rely on Wikipedia, web pages, etc.
  - They can be very good starting points but are definitely not reliable scientific references
  - Mention them in footnotes rather than in the reference section

- However, remember not to equate “scientific” with “on paper”
  - there are high quality electronic scientific journals
  - there is a lot of rubbish printed on paper
Guidelines for Writing (1)

Structure the information

- Use a **simple and logical** organization of the paper
- Omit unnecessary information/details
- Say things once – at the right place
- One topic per section
- One idea per paragraph
- Logical and verbal bridges between sentences
Write clearly

- **Describe** **everything** such that a non-expert reader has a chance to understand!
- **Motivate** and **explain** (why, what, how)
- Be **specific and clear**, not vague and hand waving
- If you cannot say it clearly, think it over again
- Define all terms and acronyms, and use them consistently
Integrity

- Carefully distinguish between
  - your own original ideas and those of others
  - what you have done and others have done
  - facts and interpretations of facts
- Do not exaggerate - abandon “commercials”
- Critically discuss your own work and assumptions

In short, be honest and serious
Choose your words carefully

- Do not try to sound elaborate
  - “An example of this fact is” → “for example”
  - “of great theoretical and practical importance” → “useful”
- Avoid buzzwords and jargon
- Ban conversational phrases like *Well, You see, Bored to death*...
- Avoid short verb forms, like *we’re, can’t, it’s, ...*
- Avoid emotional expression such as *gigantic, ridiculous, funny*...
- Be careful with culturally or geographically localized concepts, such as times, dates, seasons, school grades, currencies, ...

- *The best sentence? The shortest.* (Anatole France)
- *The letter I have written today is longer than usual because I lacked the time to make it shorter.* (Blaise Pascal)
- *Simplicity is the ultimate sophistication.* (Leonardo da Vinci)
The use of personal pronouns

- Avoid excessive use of personal pronouns
- “We” to refer to author(s) or author(s)+reader is most common
- Do not address readers with “you”
- No first person singular (as it sounds subjective)
Guidelines for Writing (6)

General

- Writing supports understanding
  - “if you can't say it clearly, you don't understand it yourself” (John Searle)
- Have high demands!
  - Read what you have written and edit
  - Do not hesitate to rewrite even big parts completely
- Do not postpone writing until the end
- Discuss your work
  - Peer review group meetings
- Overall productivity is much lower than you may expect (maybe 1–2 pages a week)
Your work must indicate competence/ability to ...

- analyse some relevant aspect(s) in depth
- analyse and synthesize arguments/resources
- back-up claims and facts by well-developed arguments, discussions and/or references
- tell apart relevant from irrelevant material, facts, and details
- make use of references in a correct way
- use a scientific style of writing
- manage the mechanics of writing; follow formatting/style guidelines
- Typesetting system to create good looking text
- You write your paper as unformatted text in a text editor, and LaTeX generates a pdf file
- Quite the opposite of WYSIWYG!
- Powerful support for layout, formulas, tables, bibliography, ...
● **From now on, everything** must be prepared with LaTeX

● Template, format, and guidelines from course web pages must be used

● Your source files will finally be to put together the conference proceedings

● Check out demo.tex and read demo.pdf
\documentclass{llncs} % declares the document type
\usepackage{...} % imports special purpose packages

\begin{document}
\title{The title} % defines the title of your paper
\author{John Doe}
\institute{...}
\maketitle

The text of the paper

\bibliographystyle{plain} % declares the bibliography formatting style
\bibliography{demo} % refers to external bibliography file demo.bib
\end{document}
@article{beck:1993,
  Author = {Beck, Kent},
  Title = {{CRC}: Finding objects the easy way},
  Journal = {Object Magazine},
  Volume = {3},
  Number = {4},
  Pages = {42--44},
  Year = {1993} }

@book{bellin:1997,
  Author = {Bellin, David and Suchman Simone, Susan},
  Title = {The {CRC} Card Book},
  Publisher = {Addison-Wesley},
  Address = {Reading, MA},
  Year = {1997},
  Annote= {Blah blah blah} }
Running LaTeX

To convert the .tex file to a pdf file

From the command prompt:

1. `pdflatex mypaper` reads `mypaper.tex` and creates
   - `mypaper.pdf` (the typeset paper) and
   - `mypaper.aux` (info about citations, references, etc)

2. `bibtex mypaper` reads `mypaper.aux` and creates reference section (`mypaper.bbl`) from BIBTeX file.

3. `pdflatex mypaper` (again!)
   - updates `mypaper.pdf` with info collected in 1 and 2.

If you get “Undefined references found” and “References may have changed”, re-run `bibtex` and `pdflatex` once or twice.
References and Resources


• The literature list, links, and examples on the course web

• Purdue Online Writing Lab (OWL) http://owl.english.purdue.edu/owl/

• The Writing Center (Univ. of Wisconsin-Madison) http://www.writing.wisc.edu/
What to do now!

- If you really want to improve
  - Re-read the slides, internalize and contemplate
  - Do this also later during the course
- Start writing your outline and annotated bibliography
- Intensify your literature research

Next step:
- **Obligatory** peer review meeting on Wed Oct 1\textsuperscript{st}
- Distribute your draft at latest Mon Sep 29\textsuperscript{th} 08:00 A.M. (to your peers + supervisor in your group)

GOOD LUCK AND HAVE FUN!