COMPSCI 601 – S1 2017

Welcome

How it will all work

The report

How it will all work

- You are enrolled in 601, 602, 751, 761, or 771
- This allows you to take a 300-level subject as a postgrad
  - You attend lectures, you do practical work (in assignments), and you complete other coursework on the 300-level material
- But to gain stage-4 credit, you must do research!
  - Registration of topic:
    - Brief submission, proposing a topic to your stage-3 instructor
    - Due Sun 20 August 11:59pm. Submit: ADB for 761, Canvas for 601/602.
  - Final report:
    - 6-8 pages, at least 3 references (your stage-3 instructor may require more)
    - Due Sun 15 October 11:59pm. Submit: ADB for 761, Canvas for 601/602.
  - Both reports are graded as assignments
- **You <u>must</u> pass the Report components to get a course grade**

Assessment

Your topic registration will be graded:

    5% on content

Your final report will be graded:

    10% on content

    5% on format

Marks from your 300-level course:

    80% total (scaled down from 100%)

- Note that you're doing about 20% more work than the 300-level students... but you'll get PG credit.
- You might allocate 20% * 10 hours/week * 15 weeks = 30 hours to your PG content. You'll have to work efficiently. Report-writing is time-consuming!

First: Topic Registration

- **1 - 2 pages** containing:
  - Proposed Title
  - Your Name, ID, UPI
  - Stage 3 course you are enrolled in
  - Abstract (not more than 500 words)
  - At least three references
  - **Summary** of the material in **one** of your references
- Your instructor *may ...*
  - Require you to write on a particular topic,
  - Require you to choose from a list of possible topics,
  - Allow you to propose a new topic that doesn't appear on their list, or
  - Require you to propose a new topic.
- If your stage-3 instructor does not approve your topic, you'll have to resubmit.
  - They should give you some feedback, e.g. why your topic is unsuitable, or why one of your proposed references is inappropriate, or just a thumbs-up "all looks good"!

The Report

- 6-8 page survey of a topic you agree with your stage-3 instructor
  - Choose a topic that's of interest to you (see list)
  - Survey the "state of the art" in your topic, focussing either on
    - Recent research findings, or on
    - Recently-developed systems / technologies
  - Your goal: to discover, and describe, a (small!) "research frontier"
- Your textbook or lecture notes can give you some starting points for your reading on your topic

Report structure

- Your Name, ID, UPI
- Report Title
- Abstract (or Summary)
- Table of Contents
- Introduction
- Main Body of Report (divided into sections)
- Conclusions
- Appendices (if appropriate)
- Acknowledgment (if appropriate)
- References

Report style

- Your report should follow the style of a professional journal such as the *Transactions of the IEEE*
  - In some subfields of computer science, the IEEE is not a dominant publisher, and most of your references may be in the ACM style or a Springer-Verlag style or some other style.
  - You may follow any professional style, but your report must all be in the same style – otherwise we may suspect your report was constructed by cut-and-paste!
  - Suitable templates are available from the 'Assignments' page of the 601 web site (https://www.cs.auckland.ac.nz/courses/compsci601/)
- Reference list: at the end of your report
  - We expect at least **10** quality references to be listed
    - All of your listed sources must be cited at least once in your report
  - Cite a source for every technical fact, design, and technical argument in your report.
    - Otherwise you're implying that you "made up" these facts, you developed these designs, and you constructed these arguments! (We don't expect you to do any of this.)
  - You'll probably read some sources you don't use in your report. (Don't cite these!)

Referencing information

- Why?
  - Acknowledge who we got the ideas/information from
  - Backs up our interpretation and conclusions
  - Others can follow up on our references to verify our conclusions
- What to reference?
  - Technical information which may be unknown to your reader
  - Your reader doesn't know all of the technical detail you discover in your research! You're explaining something they don't know
- How to use material?
  - Quote (not too much, and make your quoted material obvious)
  - Paraphrase – a minor adjustment, to fit the context of your report
  - Summarise – so that your report doesn't include irrelevant detail
  - **Don't plagiarise** (warning: we'll check for this!)
  - To learn more: http://www.library.auckland.ac.nz/study-skills

Sources of information

- Where do we go for high-quality technical information?
  - Archival sources!
  - If you reference an unstable source, then your report is unreliable – unless you are *very* careful about how you use this ephemeral information.
- Almost all websites are ephemeral. Very few are archival.
  - An HTTP GET may reveal different content at the same URL, to different people, at different times – so it isn't a reliable source of information!
- In technical writing, you shouldn't rely on what any particular person wrote at any particular time – even if that person is famous, or seems well-respected.
  - However an ephemeral source may be a good starting point for your research.
  - For example, your report might carefully analyse some (carefully specified) version of a Wikipedia article.
    - You could perform a service to our profession by editing this Wikipedia article for correctness, clarity and completeness.
    - Most articles – even in professional journals – can be improved or updated by a stage-4 student!
- Scholarly publishers are very careful about versioning.
  - If scholarly content is ever changed or updated, then it *must* have a different Digital Object Identifier (DOI).
  - If your source doesn't have a DOI, it's unlikely to be archival-quality.

Referencing Ephemera

- If you rely on an ephemeral document, you should:
    - Specify the date and time of your access
    - Specify "where" you accessed this information, e.g. by its URL,
        - http://arxiv.org/abs/1501.02885, or
        - http://www.intel.com/content/dam/www/public/us/en/documents/manuals/64-ia-32-architectures-software-developer-manual-325462.pdf, or
        - https://en.wikipedia.org/wiki/Composition_over_inheritance
    - Specify the publisher (e.g. Cornell University Library, Intel Corporation, or Wikipedia)
- If your source is explicitly versioned or dated, then you should include this information in your reference (e.g. v1, December 2015, or 13:34 8 February 2016)
- As with an archival document, you should list the author & title.
- Goal: your reader should be able to retrieve the *same version* of your source document.

Citing Textbooks?

- You'll be surveying a topical area.
  - Your goal is to demonstrate a *strong* understanding of this area.
- If your report is merely a paraphrase of a section in an undergraduate textbook, this will *not* demonstrate strong understanding at the postgraduate level!
- You might:
  - read a couple of summaries (from textbooks or research articles), read the most important sources cited in these summaries, search for recent changes as reported in research articles, then write up what you discover.
- You might:
  - read a single summary, start reading its sources, and discover that ...
  - you'll be able to review only one aspect of the topic you had proposed and agreed. That's fine – just explain what you're doing in your introduction, and write up your findings. Research is unpredictable!

How to get a poor grade

- **A grade and feedback** will be given according to your **demonstration of understanding of the current state of your chosen topic**
- How to **NOT** demonstrate understanding:
  - Write a report that is disorganised, does not have a coherent theme or line of argument, is difficult to read, contains errors or wild conclusions
  - Fail to mention *any* of the major publications relating to the topic
  - Make factual assertions which are important to your line of argument, without citing your source
  - Cite references which do not support your line of argument (this suggests you were either very careless with your citations, or that you didn't actually read and understand your sources)
  - Present portions of available publications without proper referencing (i.e. **plagiarism**)
  - Rely on weak sources, such as personal websites, blogs, or Wikipedia articles
  - *(this is not a complete list)*

How to get an excellent grade

- Display deep understanding, for example by
    - Finding a new way to classify previous research (i.e. by "dividing" your reviewed algorithms/technologies into different categories)
    - Finding a new way to identify commonalities between concepts/problems/constraints (i.e. by "merging" categories in an existing classification scheme or survey)
    - Drawing novel conclusions which are well-supported by your cited facts and arguments (i.e. by "discovering" new knowledge)
    - Putting research into a new context (i.e. by "applying" existing knowledge or technology)

How to get a good grade

- Add one or more items to an existing classification scheme
  - For example, see Table 1 in http://crpit.com/confpapers/CRPITV50Holmberg.pdf.
  - This review was written more than ten years ago...are there now any important web-based technologies which should be added to this table?
- Review the support for an existing survey...did these authors provide adequate and accurate arguments and citation support?
- Note that research sometimes returns a "negative result"
  - Although it's extremely unlikely that any technical article is "defect free", you may not be able to discover any important defect – even if you examine it very carefully.
- You'll get a good (or excellent!) grade if
  - you write a coherent account of how you "fact-checked" and "logic-checked" some reputable survey article...What errors and biases are likely to be displayed in a technical article such the one cited above?
  - As you know already: even though software usually has faults, it may still be very useful. Complex (technical) writing is similar... but are you watching for its faults and finding ways to make good use of it? That's your challenge in this course!

How to Find Sources

- Use our University Library to access the online archives of IEEE, ACM, Springer, and other scholarly publishers.
    - See http://www.library.auckland.ac.nz/databases/
- If you know a DOI, then
    - a free-to-view abstract should be available at http://dx.doi.org/DOI
    - If you hit a paywall, try http://dx.doi.org.ezproxy.auckland.ac.nz/DOI
- Google Scholar will reveal
    - Articles which cite your source
    - Other versions of the source with the same title (you should choose the archival version, if there is one!)
    - Other articles by the same author

Have Fun!

- Research is an exploratory process:
  - You'll be learning by trial-and-error, and will hit some dead-ends.
  - Try to relax about the "mistakes" and enjoy the process of discovery – you can't predict what you'll discover next!
- You can pick any topic you want from the list, so pick something that interests you!
  - Gill will insist that you stay within the general area of their course, but is very unlikely to give you any particular direction – that's up to you!
  - Try to find a way to enjoy this freedom!
  - If you were contracted to perform research on your topic, you'd be getting extrinsic rewards ($, reputation) as well as intrinsic rewards – the joys of discovery and of sharing your findings with others.

Publish your report?

- Please consider sending an email to me at the end of the semester, giving me permission to publish your report in an archive similar to
  https://www.cs.auckland.ac.nz/courses/compsci725s2c/archive/termpapers/