More Grad School Survival Skills
CPS 300: Introduction to Graduate Study
Jun Yang
September 10, 2008

Announcements
- Welcome Dongtao Liu
- You should soon hear from faculty mentor (if not already)
  - Let me know if you haven't by the end of this week...
- TCSDLS talk next Monday by Garcia-Molina
  - Attendance required
- Grad student retreat next weekend (September 19-21)
  - Please attend!
  - Your assignment at the retreat: pick at least two posters that interest you most and study them carefully
  - See the last two slides in this lecture for details
- "Resources" pages on the website have been updated

Discussion on last assignment
- Finding the "seed" paper
- Who did you talk to?
- Hunting related papers
- How did you find them?
- Document editing and reference management
  - LaTeX and BibTeX weren't that bad, were they?
  - What editor/environment did you use?
  - Anybody tried Microsoft Word?
  - "Aha!" moments?
- Questions?

Misc. LaTeX tips
- Why use tilde (~)?
  - In earlier work~\cite{…}, …
  - In Section~\ref{…}, …
- Why use backslash (\)?
  - Intl. Conf. of …
  - \newcommand{\DCS}{DukeCompSci}
  - … \DCS\ is located in …
- What is wrong with the following?
  - $O(\log n)$
  - $C_{left} \gets cost \cdot n$ …
  - … is required\footnote{…}.
  - … is "required".
  - … $100,000$ elements …

Figures in LaTeX
- Vector graphics vs. bitmap images
  - Plots, diagrams: use vector graphics format (.eps)
  - Photos, video frames, screenshots: use bitmap images
- Xfig makes beautiful vector drawings
  - Texts flagged as "special" are processed with your LaTeX document
  - You can use any LaTeX command (even your own macro!)
  - Fonts are consistent with the rest of the document
  - Makefile and LaTeX macro make it very easy to include LaTeX-enabled Xfig figures
- Microsoft tools (e.g., Word, Visio, PowerPoint) are simpler, but
  - Remember to export as vector graphics
  - Fonts sometime cause problems
  - My procedure: print as PDF, crop and export as .eps from Acrobat

BibTeX tips
- \strings.bib: string definitions, e.g.:
  - @String{sigmod = {{ACM} {SIGMOD} International Conference on Management of Data}…}
- \refs.bib: the references, e.g.:
  - @InProceedings{sigmod06-SilbersteinBraynardEtAl-conch_sensor,
    author =       {Adam Silberstein and Rebecca Braynard and Jun Yang},
    title =        {Constraint-Chaining: On Energy-Efficient Continuous Monitoring in Sensor Networks},
    crossref =     {sigmod06},
    pages =        {157--168},
  }
- \crossrefs.bib: venue info, factor out to avoid redundancy, e.g.:
  - @Proceedings{sigmod06,
    title =        proc#{ 2006 }#sigmod,
    year =         2006,
    booktitle =    proc#{ 2006 }#sigmod,
    address =      {Chicago, Illinois, USA},
    month =        jun,
  }
- In the LaTeX document
  - \bibliographystyle{strings,refs,crossrefs}
  - Use the following bibtex command to avoid creating separate bibitems for the cross-referenced entries
    - \bibtex --min-crossrefs=100 …
  - You can build a powerful bib db environment with Emacs
  - I use it to manage PDFs of papers and notes on them
Anxiety vs. reading

Deciphering academese

How to read a paper

Above all, question authority
- Identify the problem being solved
- Attack the problem yourself, without looking at solutions
  - At least come up with their "strawman" solution
  - Might even get a better solution!
- Read their solution and compare it with yours
  - Are you convinced which one is better?
- Write a short, poignant summary; record in your bib db
  - Don’t just copy their abstract
  - Keep additional notes in your bib db when you revisit the paper or discuss it with others

On reading motivation

- Is the problem new?
- Is the problem important?
- Is the problem interesting?
- Is the problem contrived?
- Learn how people make good/bad pitches
  - Some papers overstate/understate their applicability
  - Can you do better?
- Come back after finishing reading: did they solve the same problem motivated earlier?

On reading evaluation

- Do the experiments tell you anything new?
  - Many simply confirm the obvious!
  - E.g., # of ops counted analytically vs. # of ops measured
  - How do you make it more interesting?
- Is the paper trying to hide something?
  - Unexplained "magic sauce"
  - E.g., how to tune a parameter that affects performance
  - Choices of workloads and parameter ranges
    - E.g., synthetic datasets, unreal uses of real datasets, or x-axis covering a small range
  - Choices of performance metrics
    - E.g., an index costs 1/10 of the I/Os incurred by a full scan—great?

Other reading tips

- Read related work carefully
  - A glimpse at the bigger picture and pointers to follow to learn more about the problem/area
  - Think beyond their related work discussion
  - Congrats if you uncover non-obvious connections to other areas!
- After you finish reading
  - What is the "take-away" message?
  - Think about future work
    - What assumptions can be relaxed or introduced?
    - Learn to appreciate their contributions
  - Don’t judge what a paper is about by its abstract
  - Corollary: if you cite it, better read beyond the first page!
When to meet with advisors

WHEN TO MEET WITH YOUR ADVISOR

Is there a good time?

Beginning of the week
Prem: Get more work quickly
Cons: You have a guaranteed date with work on Sundays

End of the week
Prem: You might actually have time to work on them.
Cons: You might not!

Mid-week
Prem: Good balance. Give yourself time to work on feedback.
Cons: Your advisor will probably not show up (advisors, this might be a sign!)

Saturday/Sunday
Prem: There is no "you".
Cons: You have more of a workaholic mentality. Good luck with that.


Keep the pressure on!

Too often, advisors make advisees pressured, guilty, and scared.
But it should be the other way around!
Good advisees should make advisors feel (happily) pressured, guilty, and even scared.

Take initiative!

Propose weekly goals, meeting agendas, new problems.
Propose weekly goals, meeting agendas, new problems.

Good strategy for getting more time from busy advisors.

Meeting of the minds


Make meetings effective

Start with a summary of the last meeting and an agenda for this one, and end with concrete goals for next week.
Whatever you give to your advisor needs to show enough polish.

Their time is more valuable, and they will get tired of correcting simple mistakes all the time.

What if you get stuck?

Come up with alternative approaches yourself.
Keep a log of all thing you tried, and why they failed.

If all else failed, tell your advisor; don’t wait until the next scheduled meeting.
Even with no positive results, you will have lots of failed alternatives to report—which are still useful to research.

Communication is important

Want your advisor to be your best advocate?
Always keep him/her in the loop!


Assignment details

Pick at least two posters and study them carefully.
Find ones that interest you most—not necessarily the best posters per se.

Part I: when you saw the poster without the presenter
What caught your eyes and drew you to the poster?
Did you know what order to read the poster elements?
Could you follow the main ideas just by reading?
Did you have the patience to read it all, or did you skip parts?

Part II: when the presenter explained the poster
Which elements of the poster did they point to in order to illustrate their points?
Which ones did they not use?
Were there any points that could have been helped by having something on the poster which was not there?
Assignment details (cont'd)

- Part III: watch how the presenter handled traffic over time
  - How did they cope with people arriving at different times?
  - What did they do when no one was at their poster?
- Part IV: after the retreat
  - Email me your choice of two posters; I will send you the PDFs
  - Annotate these posters with ideas for improvement
  - Be prepared to share your thoughts at the next class meeting
    (Sep. 24—three days after retreat)