CSci 8002: Intro. to Research in Computer Science - II

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Outline

• (Re)introduction to course
• Class introductions
• Discussion of Literature Review
• Group work (time-permitting)
• Wrap-up and return 8001 work
Discussion of course

Please refer to hardcopy of syllabus
Class introductions

- Your name
- Status in Ph.D. program (1\textsuperscript{st}/2\textsuperscript{nd} yr.)
- Educational background
- Research interests
- Advisor/prospective adv. (if known)
- What you hope to get out of the course
- Future career plans (if known)

At a minimum, learn the name of your neighbors today and talk to each other!
Sit in a different spot each day.

1/19/18
The literature review

• A comprehensive written exposition of the status of knowledge on a focused and important topic (consistent with submitted pre-review and feedback in 8001).
  – Motion planning in robotics
  – Voronoi diagrams and their applications
  – Support Vector Machines for machine learning
  – Model checking in software engineering

• Distill info. from multiple sources
  – Summarize
  – Synthesize
  – Critique

Must be in your own words and reflect your understanding and unique viewpoint of the subject matter. Should not be a verbatim recitation from sources.
Benefits of lit. review

• Helps gain deep knowledge of and appreciation for state of the art
• Helps identify directions for new research and provides solid foundation for research. (Avoids reinventing the wheel.)
• Helps clarify one’s thoughts (as does most writing)
• Could be publishable if done right. Gives one visibility and credibility
• “Reusable” in multiple ways (papers, exams, thesis, talks, funding proposals, etc.)
Do a literature search for papers on your topic (e.g., use Google Scholar)
Identify (recent) papers that appear relevant. If number of papers is too large/too small then narrow/expand your scope
Read the papers and make notes
Summarize, synthesize, and critique the papers
Write your literature review
Review, reflect, revise...repeat
Structure of a lit. review
(some questions to consider)

• What is the theme/focus of the review?
  – Algorithmic techniques for a class of problems
  – Evaluation of software tools for some application
  – Benchmarking of certain types of computer system
  – Evaluation of cryptographic protocols
  – Quantitative vs. qualitative
  – CS-only or contribution of CS to X and/or vice versa
  – ...

• How should it be organized?
  – Chronologically or by methodology or by problem type, or a combination?

• What is the scope of the review?
  – Breadth vs. depth

• What is the target audience?
  – Yourself, your peers, advisor, broad scientific audience, lay person?

• What is the end goal?
  – Gain in-depth knowledge of a new area for yourself, present your expertise to help others, ...
Structure (contd.)

• What type of sources to use and how reliable are they?
  – Books, reputable journals, confs., wksps.; ACM, IEEE, SIAM, ...
    • Peer-reviewed
    • Not peer-reviewed generally, but generally “safe”.
  – Online sources (Wikipedia, blogs, forums)
    • Can be of dubious and uneven quality. May use as a starting point but **must** verify against reliable sources.
    – Cite all your sources in the review

• Is review balanced? Are all viewpoints represented?
• Is it a summary + synthesis + critique across all papers?
  – Not simply a recitation of facts and statements, taken one paper at a time.
Guidelines for lit. review

• Distributed in 8001 in Fall ‘17
• Posted on 8002 class web page, under “Schedule”

Please read and follow guidelines carefully!
Wrap-up

• Next class
  – Discuss framing of research questions
  – Read guidelines (will be posted this afternoon)
  – Come prepared with your thoughts/ideas/examples (group work)

• Other readings
  – TBD and posted later in the week

• Reminder
  – Lit. review due next class
  – Pick up 8001 work today

• Questions/discussion?