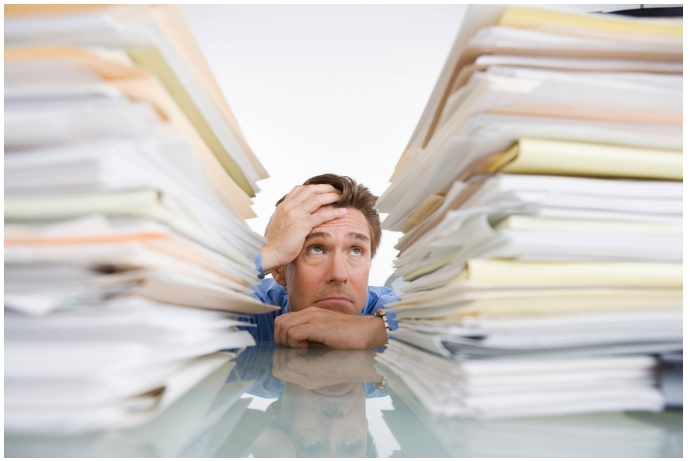
Chapter G:I

I. Scientific Toolbox

- Literature Research
- Oral Presentations
- Scientific Writing

Literature Research

What it is and why to do it



- Fundamental task in science
- Time-intensive but necessary
- Hardly anybody is the first on a problem
  . . . if someone is, what does that tell you?
- Don't reinvent the wheel

- Find out if an approach to a problem is new
- Find alternative approaches or perspectives
- Widen the scope of the problem
- Obtain background information
- Obtain evidence for your or others' claims
  . . . and similar reasons

Literature Research

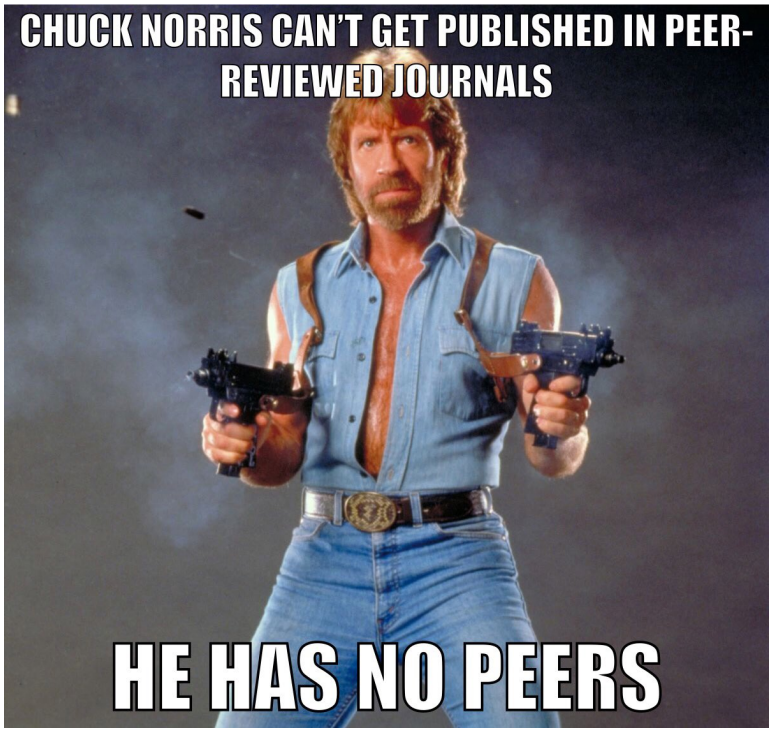
Types of scientific literature (and similar)

- Textbooks, monographs
  - Theory, basics, approved techniques
- Scientific journal papers
  - Completed research lines
- Conference full papers
  - State-of-the-art research
  - Major publication type in computer science
- Conference short papers / Workshop papers
  - New ideas, ongoing research
- Technical reports
  - New ideas, ongoing research, smaller contributions
- Conference / Online tutorials
  - Easy access to basics and techniques
- Popular science magazines
  - Easy access to research lines
- Other websites
  - Anything

Literature Research

What type to prefer (in our field)

- Literature should be peer-reviewed
  - Most books, journal, conference, and workshop papers are, but not all
- Rule of thumb
  books $\succ$ journals $\succ$ conferences $\succ$ workshops $\succ$ tech reports $\succ$ magazines $\succ$ websites $\succ$ other
- . . . with exceptions like
  top conferences $\succ$ average journals

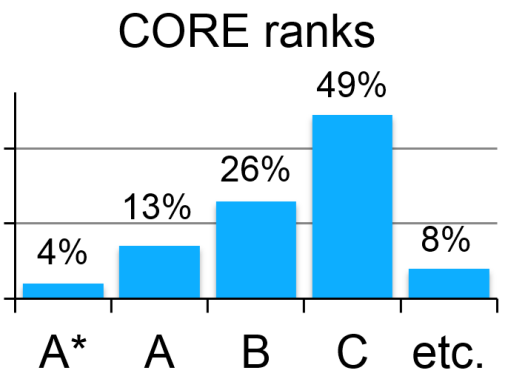


Literature Research

Assessing the “quality” of literature

- Conference and journal rankings
  - Top tier ranked A^+ / A* or A; B still good
  - Unranked conferences / journals may be doubtful . . . or very new

    No ranking achieves complete coverage, though.
  - One very reputable ranking is CORE [core.edu.au/conference-portal]



- Number of citations
  - Roughly indicates importance
  - Rather for relative comparisons within a topic
  - Remark: Newer papers naturally tend to have fewer citations
  - One resource for citation numbers is Google Scholar [scholar.google.com]

    Journals also have so-called impact factors derived from citation numbers.
- Disclaimer
  - Good and bad research appears at all places
  - Often, only reading helps . . . life is hard ;-)

Literature Research

Reading and finding literature

- Reading papers efficiently
  - Read abstract, introduction, and conclusion
  - Look at figures and tables
  - Decide whether worth reading everything
  - Read goal-driven

    Specify questions to be answered during reading.
- Finding the next paper
  - Follow promising references at the end of a paper
  - Find promising papers citing a paper
  - Learn to identify the best search terms

    Rule of thumb: As specific as possible, but as abstract as needed.
- Getting started in a seminar
  - Read the material we provide
  - Then find further literature

Literature Research

Acquiring literature

- Obtaining papers
  - Many papers are simply freely available online
  - Others might be free from within a university network
  - Others might be send by authors on request
  - If neither, maybe your advisors can help
- Important sources
  - dblp for any literature related to computer science [dblp.dagstuhl.de]
  - Google Scholar or Semantic Scholar for any scientific literature
    [scholar.google.com] [semanticscholar.org]
    ... and general web search, of course
- Accessing books
  - Check if available in the library
  - Some accessible online, for example, on Google Books [books.google.com]
    Purchasing books can make sense when of continuous importance for you.

Literature Research

Organizing literature

- Literature organization
  - Maintain notes and overview
  - “Extra” effort will pay off
- Create logical folder structure
  - Build your own view of the field
  - Logically subdivide topics, but don’t over-engineer

    For instance ./material/query-understanding/query-segmentation/ – but probably not deeper.
- Rename all PDFs consistently
  - Simplifies browsing and `grep`-ing
  - We use <author><year>-<full-title-lower-case-no-special-chars>.pdf

    As in risvik03-query-segmentation-for-web-search.pdf
- Organizing meta-information
  - Create bibtex entries directly when organizing literature

    Very good source for computer science is dblp [`dblp.dagstuhl.de`]
  - [Here] is an example of collecting and organizing bibtex entries