"If I have seen further, it is only because I have stood on the shoulders of giants".

Attributed to Sir Isaac Newton

The literature

- Literature can help in finding a research problem
  - identify clear ‘next step’ or ‘gap’
- It can also help you solve a problem
  - show how the field works (so you fit in)
  - provide evidence you can quote without repeating the work
  - provide the motivation to show importance
    - eg our performance is better than that of [Cite]
    - eg [Cite] defined the following concept, about which we prove …
    - eg [Cite1, cite2, cite3] have all worked on systems like this.
- Critical (yet generous) reading.

Reading the literature

- Keep an annotated bibliography from the start
  - Complete bibliographical reference (including pages, dates)
- Detailed notes on each work
  - even if it seems irrelevant to your thesis
  - what is claim, what evidence, what argument, any doubts?
- Don’t rely on second hand summaries! Go to the original source always!
  - Get attributions right in your own writing
    - (don’t just accept citations from other work, even with full reference!)
- Use comments and keywords to organise your thoughts.
Why literature review?

- Demonstrate that you know the field
- Justifies your research, provides the rationale for the research
  - how does your work differ from previous work
  - how does your work connect to previous work
- Allows you to establish the conceptual framework and methodological focus

Organising the literature

- Isolate issues and highlight the findings and contributions that are central to your research
- Group together papers that deal with a common or related theme or issue
- Use diagrams, tables, concept maps to organise the materials
- Try out different structures for organising; they should be most relevant to the goals of your research
- Chronological order is not particularly useful
  - but citation chains are useful
- Warning: papers often don't use common terminology, or focus on common issues, or explain relationships fairly
  - Clarifying these aspects is a key contribution you can make

Understanding the literature process

- We summarize how work comes to be published
  - So you can recognize implied strengths and limitations in what you are reading
- We hope you will plan your work so it can itself be published
  - usually after the thesis is finished

Conference paper

- Call for papers (about 1 year before meeting)
- Submission (due 4-8 months before meeting)
  - page limit (say 10 pages)
  - details often omitted (eg proofs, design technicalities)
- Reviews by Program Committee
  - check reasonableness, significance, originality, readability
  - selection based mainly on interest to the community
- Final version for proceedings (due 3-4 months before meeting)
  - revise by author in light of reviews
  - but not checked again (except for a few top systems conferences)
- Oral presentation at meeting
Workshop paper

- Sometimes a workshop paper is just like a conference paper
- Other workshops are more preliminary
  - can publish “position paper” (draft of an idea without evidence, or proposal for future work)
  - not reviewed
  - mainly to allow a community to gather

Journal article

- Submitted
  - often based on a conference paper with additions, corrections, improvements
  - usually an account of a contribution, but sometimes a survey that integrates a field
- Refereed
  - at least 3 referees, experts in the field
  - they spend months on the job, checking details etc
- Revision, more refereeing
- Accepted
- Published
- Time lapse variable, but sometimes 3-4 years!

Technical report

- Issued by the authors department, with a number and date
- May be based on a conference paper
  - Include all the boring details, that are omitted from conference due to space limits
- Used to establish priority
  - eg produce TR before submitting work to others

PhD or MSc Thesis

- Very extensive account
  - show much of the research process
  - extensive survey of the literature
  - very complete evaluation of the author’s work
  - establish the author is ready to become independent researcher in the community
- Typically checked by 2 or 3 readers
Monograph

- An author can offer a coherent and unified account of a whole research agenda
  - often combine their own results with other peoples
  - often revisit several papers with uniform notation, better exposition, etc
  - publisher may get reviewers, but their focus is “will it sell” not “is it correct”!
- Sometimes a book is just a collection of papers from a conference or workshop
  - usually not much more checking or detail than for conference itself!

Warnings

- Except for journal articles, very little checking has been done of the correctness of the claims
  - you can’t rely too much on the truth of what you read!
- Journal articles are usually archival
  - the field has moved on
- Some communities are very clique-dominated
  - unpopular opinions not welcome
  - clique leaders can publish anything, even half-baked ideas without evidence

The research communities

- A community has places of high prestige where they read and publish
  - they meet often, and each knows what others are doing
  - you must place your work into context of some community
- Divided by subdiscipline in a hierarchy
  - eg “Systems” contains “Networking” contains “Wireless networking”
  - eg “Theory” contains “Algorithms” contains “Graph Drawing”
- Divided geographically
  - often Europe vs Asia vs America
  - sometimes separate schools (eg Wisconsin database group)
- Divided by approach or background
  - eg “neat AI” vs “scruffy AI”