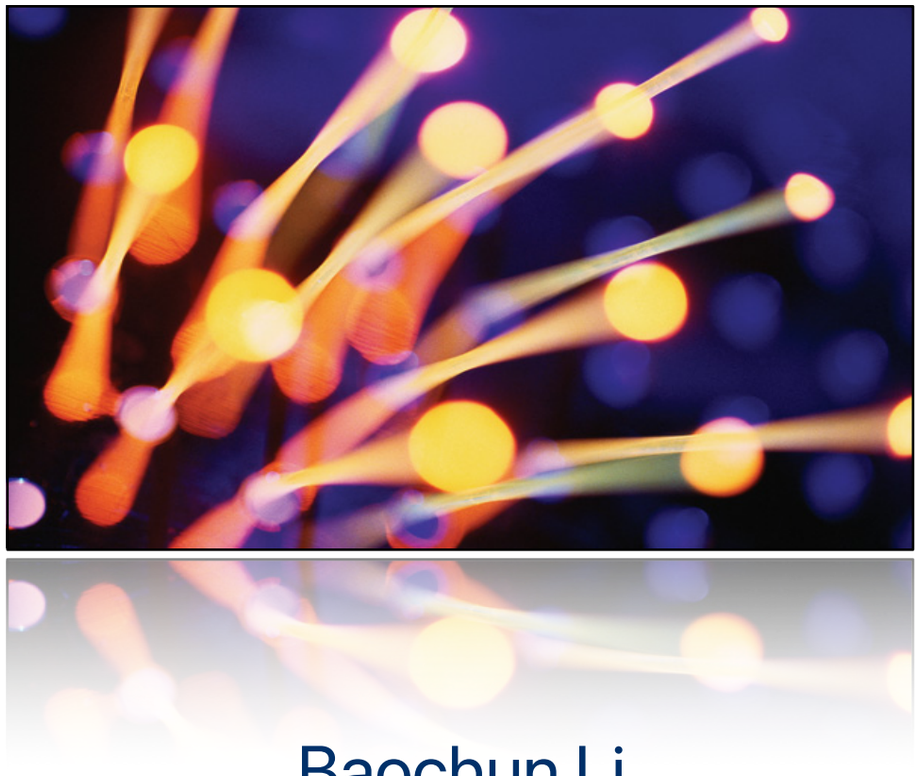
Episode 2. Writing Your Course Paper



Baochun Li
Department of Electrical and Computer Engineering
University of Toronto

What do you write about in the course paper?

Choose a topic for the course paper

Cloud computing

Distributed systems (such as blockchain systems)

The use of game theory and economic markets in the analysis of large-scale system behaviour

Security and privacy

Other topics: upon approval of the instructor

What do you write about in a paper?

So what do you choose?

- The one that excites you (or at least interests you)
- The one that you believe will be trendy in the research literature
- The one that may fit the research project you are currently working on

Become an expert in the topic

Read papers (a lot of them) towards this specific research topic

But how?

Start with one paper

that is important, a landmark or a breakthrough in the research direction

that is most recent

that has been cited frequently

that has a long bibliography (possibly an outdated survey itself)

Expanded-ring search

Read the references in the initial paper

Read the papers that cited the initial paper

Identify the faculty member in the author list, read the papers from the same group

Read the papers/theses from the same student author

Read the papers from the same session in the conference the initial paper is published

Do not rely on google

Google is not the best way to find good papers

- It’s good for finding research group or authors’ web sites, though

Paper titles may be very misleading

When do I stop?

Stop till the set is self-contained

How do you read a paper?

Read a paper in three passes

First pass: read the title and abstract, and perhaps part of the introduction, and skim through the remainder

Less than an hour

Record what you have found

If the paper is found to be relevant, useful, and exciting: second pass

Second pass: read most of the paper, but skip details that take more time to understand

3-5 hours, including experimental results, record what you have found

If the paper is directly related to your work, final pass

Final pass: read all details in a paper, and think about the relevance to and difference from your work

As much time as you need, record what you have found

Record your papers

In .bib format in LaTeX

Bibliography software may be helpful if it generates .bib (such as Bibdesk in Mac OS X)

At least remember the conference/journal, and last name of the most important author

Important to share it with others, or to find it later

Getting new insights

Find the common theme, objective or problem of all related papers

Categorize the papers in terms of their differences

Sort them in terms of maturity *level*

Usually its related to its date of publication

Not always

More on writing a good course paper

Categorize the papers

Do the papers differ from each other in terms of —

- Problems to be solved
- Techniques used
- Assumptions of the system
- Nature of the paper (theoretical studies vs. practical protocols)

Is that sufficient?

Once you have categorized and sorted the existing work:

- Establish several “tracks” of work (usually identified using references)
- Understand the flow of ideas in each “track” of papers

Record everything you have found

- You write the course paper out of your discoveries
- A paper brings interesting and original insights to the table
- A paper can be published (perhaps as a tutorial or book chapter)
- A paper may be well cited

Be graphical

Draw in your favourite graphing program or on scratch paper:

The “tree” of ideas, each branch may be a track, and the root of the tree may be the first paper in this direction

You may include your own “tree” (or a few more modest tables and charts) in your paper

Comparisons

Academic papers are not usually comparable to each other, or to benchmarks

Identify those good papers that are

Use charts to visually illustrate the results

Include your own comments and observations

It's like writing one — and more formal — critique for many papers

Is it realistic? Bring the point of view from the industry

Is the problem solved?

How can the research go further towards this direction?

Attention to detail is important

Once you have become an expert, you write your own

- Originality — novel and new insights
- Exciting introduction with strong motivations
- Completeness of literature survey (“related work”)

Write in a clear way

Write in a way that is clear and easy to digest

- The reader may not have a lot of time reading your paper
- It is your responsibility to keep the reader motivated and continuing to read
- Paragraphs should be well planned and well written
  - Do not use very long paragraphs
  - A paragraph should have a focus
  - There should be a clear transition between two adjacent paragraphs
- The flow of ideas throughout the paper should be very clear
  - Flow your ideas naturally

No spelling, grammatical, and usage mistakes

These mistakes will discourage the reader

A reviewer of the paper is not a professional English proofreader

If the reviewer finds that the paper is too hard to read, the paper will be rejected

Proofreading the language is the easiest part of writing a paper, but most writers do not do this — the costs may turn out to be huge

Tips on writing

Do not use long sentences, use shorter ones with simple grammar

Avoid using “big” words, use plain and simple ones

Use readable font sizes in figures

Proofread your references and make them consistent

Never cut and paste in the same paper

Grading your course paper: evaluation criteria

Completeness of references

New insights

Clear flow of thoughts

Easy to read and to understand

- Include figures as many figures as you wish
- Free of spelling and grammatical mistakes

Grading your course paper

The rubrics are available for download from the course website

- Applicable to both the midterm draft and the final paper

Two samples are also available for download from the course website

- I wrote them myself