Professional Basic English
Lecture 12

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Writing the literature review

- Selecting the sources
  - Find the most relevant references
  - Assess the reliability of the references
- Acknowledge your sources
  - Essential requirement in academic writing
  - Use established citing conventions
- Critical use of sources
  - Negative / neutral / positive evaluation
- Building a storyline of the developments in the topic
  - Roadmap from earlier research to your work

Selecting the sources

- Wikipedia and many websites good places to start looking
  - However, do not use as primary source!
- Tutorial and survey articles in scientific journals
  - Use for example keyword “survey” and topic in search engines
- Try to find the most recent relevant publications on the topic
  - From their reference lists, you can get help to find the relevant references
- Ask yourself if the source is relevant for your study
  - If the answer is no, maybe better to leave out

Classroom task 1

- Look through the shared sources and assess their reliability. Which source you would assume to be the most reliable?

How to find relevant sources?

- It is not enough that the source is reputable, it should also be relevant to your paper
  - The papers most closely related to your work should be identified and cited
  - If the field is rapidly developing, you need to look for the very recent work
- Websites and platforms in the Internet can be used
  - Wikipedia can be a good place to start searching; however, Wikipedia should NOT be cited as a primary source
  - Search engines: Google Scholar (https://scholar.google.com), Bing (https://cn.bing.com/academic), publication databases, university library websites etc.
  - ResearchGate, LinkedIn etc. for following the ongoing work in the field

How to evaluate reliability of a source?

- It is essential to evaluate the reliability of the sources
  - Peer-reviewed publications preferred as primary source of information
- Different publishers, journals and conferences have different reputation: it is essential to use credible sources
  - In computer science, e.g. IEEE and ACM are considered reliable publishers; papers in their databases usually indicate reasonable quality
  - China Computer Federation (CCF) maintains its classification system for journals and conferences (categories A, B, and C)
- Metrics such as Impact Factor (IF) or inclusion in indexing services such as ISI are often used as indicators of scientific quality
  - Should be noted that “good” and “bad” IF depends on the discipline

Number of citations

- Important and influential publications are usually cited by many researchers
  - “Long tail” of citations: most papers receive very few citations, some papers hundreds or thousands
  - Number of citations often considered as a rough paper quality indicator
  - Citation indices available in traditional indexing services (e.g. ISI), but also more recent academic search engines, such as Google Scholar
- Influential researchers have a lot of papers with a lot of citations
  - H-index is considered as a rough estimator for researcher’s influence

Internet sources

- More and more information in the Internet (websites, blogs, Wikipedia, technical reports, preprints etc.)
  - Typically not peer-reviewed: should not be used as a primary source
  - However, different websites, e.g. Wikipedia, can be a good starting point to look for information
- How to evaluate reliability of the sources in the Internet?
  - Authority (reputation of the author), affiliation (website and the author), target audience (expert/general public), currency (is the content up to date), indicators of content reliability/accuracy

Checklist for web content reliability

- Currency
  - Is the website up-to-date? Are all the links working?
- Factuality
  - Is the information factual, not opinion?
  - Are sources given, can you verify the information from other (printed) sources?
- Presentation
  - Does the material have substance and depth?
  - Is there convincing evidence and logical arguments?
  - Is the language neutral or emotional?
  - Is the text free of spelling errors and other signs of carelessness?

Giving acknowledgement

- In scientific writing, it is expected that the related work by other researchers is acknowledged by citing
  - Scientific research an incremental process building up on others' work
  - Citations indicate recognition of the work; lacking reference is easy to interpret as plagiarism or an attempt to own other people's ideas
  - References allow readers to find the essential prior art easily
- Essential to use proper citation technique
  - Follow the model in the template
  - Avoid copying text directly from the sources (may be marked as plagiarized in plagiarism detection systems)

Citing in computer science

- In computer science, numbered references cited by giving their number in brackets: “Our work builds up on the method presented in [1]”
  - *[1] A. Smith, “The Method for Everything,” Journal of Whatever 16(1), pp. 5-7, Jan. 2015.*
- Multiple citations can be combined inside the brackets
  - *Several different image compression algorithms have been described in the literature [1-5]. In this paper, we focus in the algorithms in [1,3].*
- Direct quotations in quotation marks (better to rephrase)
  - *Quality is the ability of the product to fulfill customers’ expectations [1].*
  - *According to [1]: “Quality is the ability of the product to fulfill customers’ expectations.”*
  - *In [1], quality is defined as the product’s ability to fulfill the expectations by the customers.*

Other citing conventions

- Using the last name of the (first) author
  - *This topic has been studied earlier by Smith (1980, p. 42) and Wesson (2002, p. 523).*
  - *It has been suggested that the method does not work (Williams et al., 1998).*
    - *Smith, A.: "The Fundamental Book," Academic Press, NY, USA, 1980.*
    - *Wesson, B.: "Even More Fundamental Book," The New Publisher, London, UK, 2002.*
    - *Williams, C. and Adams, D.: "A Journal Article," Nature, 14(2), pp. 51-57, Feb. 1998.*
- Check the proper citation and reference format – often there are examples or a template available

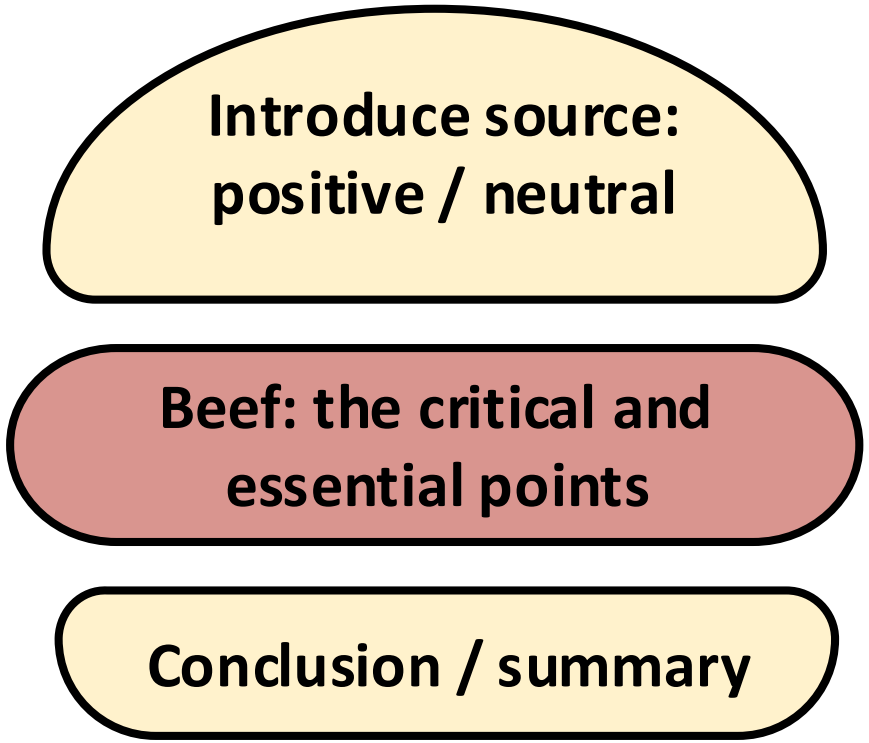
Critical use of sources

- Of course, obviously unreliable sources should be ignored
- Even reliable sources should be used critically
  - Think about clarity and validity of the source in general, according to your general knowledge about the topic and other sources
  - Think about the relevance of the source to your own work: the most relevant sources deserve the widest coverage
  - In your literature review, point out the limitations and weaknesses of the sources
  - Find a balance between positive acknowledgement and critical comments

Examples of critical review

- *Despite its benefits, the scope of the work is limited to X.*
- *Neither X or Y was considered / addressed in sufficient depth.*
- *However, the method only works under the condition X, which limits its use for more realistic use cases.*
- *Unfortunately, the computational complexity of the algorithm is too high for practical applications.*
- *The method has not been validated with authentic data / use case.*

Hamburger model of review



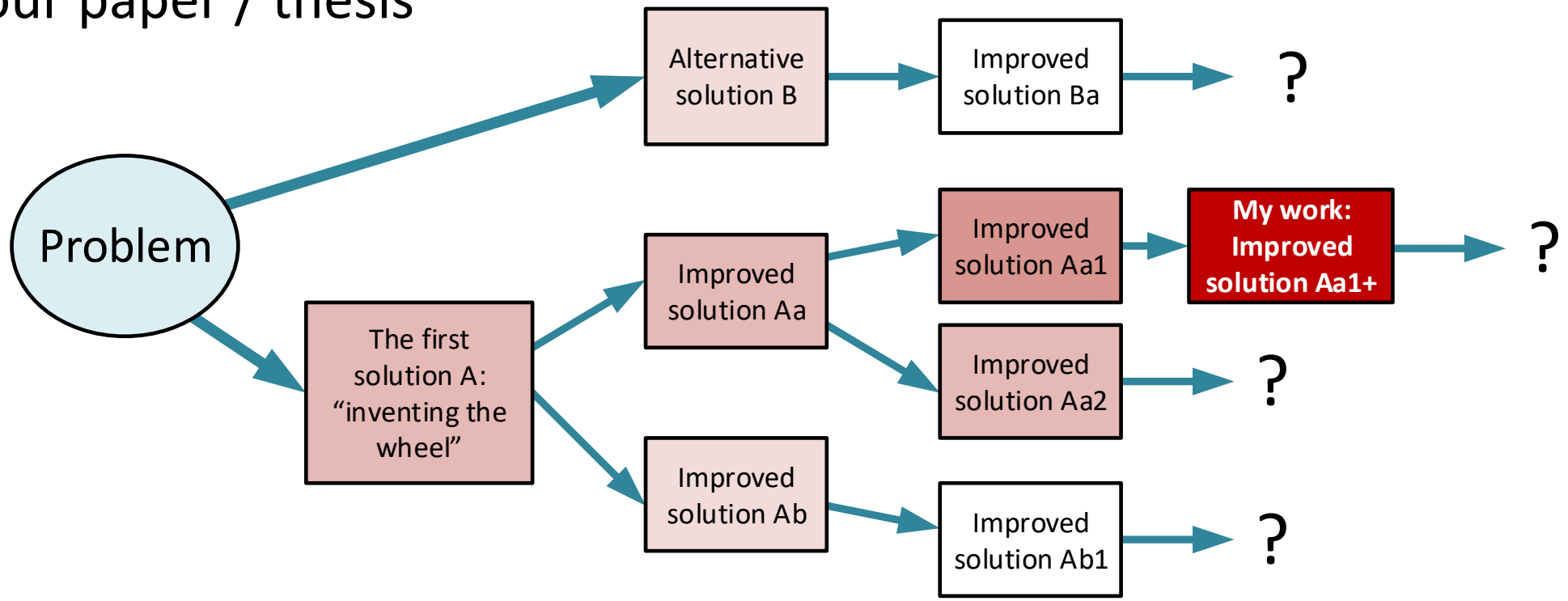
The first study to address topic X was by Smith et al. [x]. In their work, they developed an algorithm Y to solve the problem X.

In the basic scenario, Smith's algorithm works well. However, the algorithm is only valid under conditions Z and Q, which is not a realistic assumption in many scenarios.

More research is needed to develop a more universal algorithm considering the limitations of the algorithm Y.

Building a storyline for literature review

- Research builds up on older research: start from the fundamentals, then narrow the scope towards the aspects that are relevant for your paper / thesis



Motivating your “roadmap”

- Summarize the fundamentals and the problem statement
  - Brief literature review of the early work in your topic
- Review different alternative solutions or viewpoints
  - What are the strengths and the weaknesses of different alternative ways to solve the same problem? What are the constraints and limitations?
  - Focus on the sources that try to solve the same aspects of the problem as your work
  - Focus on the strengths of the studies or methods on your chosen roadmap: why have you chosen this road?
  - However, remember to give fair credit to alternative methods: they may be useful in other scenarios than yours

Classroom task 2

- Read the attached literature review for the paper *"Deep Face Recognition"* by Parkhi et al.
- Answer the following questions:
  - Which references describe "shallow" face recognition methods, and which references describe "deep" face recognition methods?
  - Which reference describes the original DeepFace method?
  - Which references describe improved versions of DeepFace?
  - Which reference describes the best face recognition method that is currently available?

Consider the type of your study

- Journal or conference paper
  - Page limit usually applies: you need to focus on the essential sources
  - You do not need to cover the fundamentals comprehensively (readers are assumed to know the topic already)
- Surveys, tutorials and book chapters
  - More comprehensive literature study required
  - The purpose is to guide the reader from the basics to the most recent advancements in the topic
- University course reports and thesis
  - Comprehensive literature study usually required: you need to show that you know the topic and you are ready to contribute the topic by yourself

Writing a literature review: summary

- It is essential to use references in scientific writing
  - Shows the reader that you know your topic
  - Acknowledges the earlier work on the topic
  - Puts your study in the right context
- Tips for writing a good literature review
  - Find reliable sources that are relevant to your study
  - Give fair credit to the authors of the relevant sources
  - However, also show weaknesses and limitations of prior studies
  - Focus on the sources that are most essential to your work