Research Skills

Advanced MSc and PhD Students

http://www.cs.bham.ac.uk/~jxb/rs.html

Lecture 10
Writing

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Scientific Communication (formal & informal)
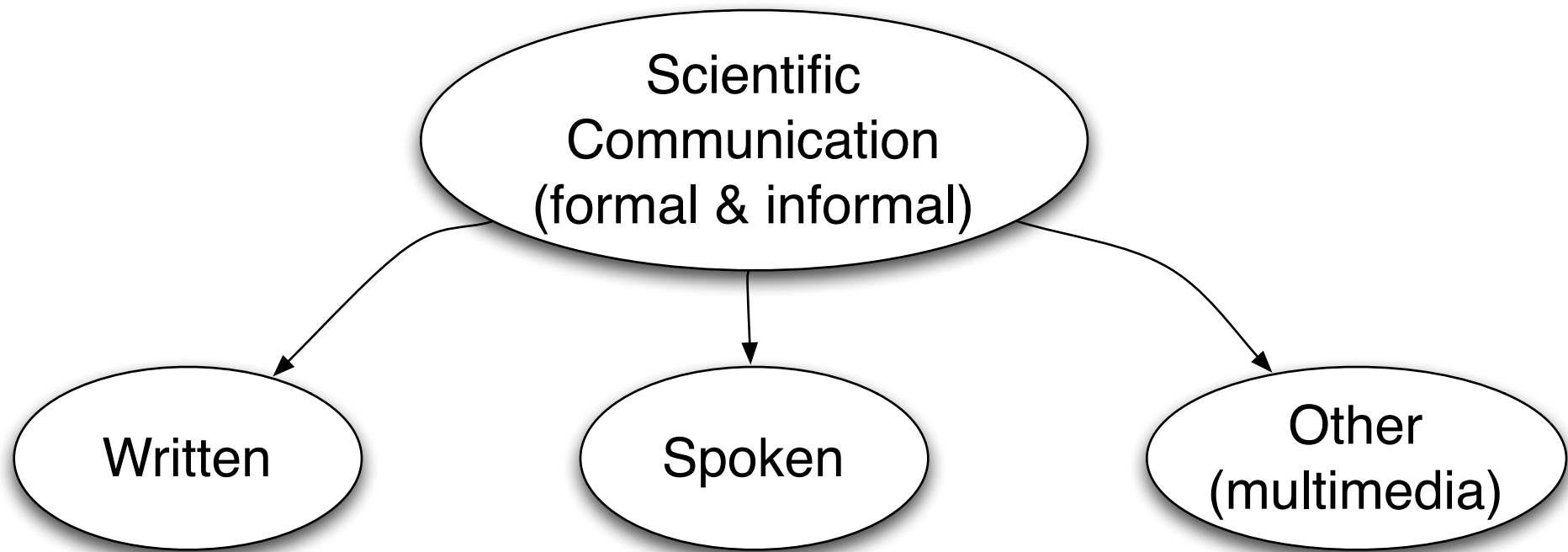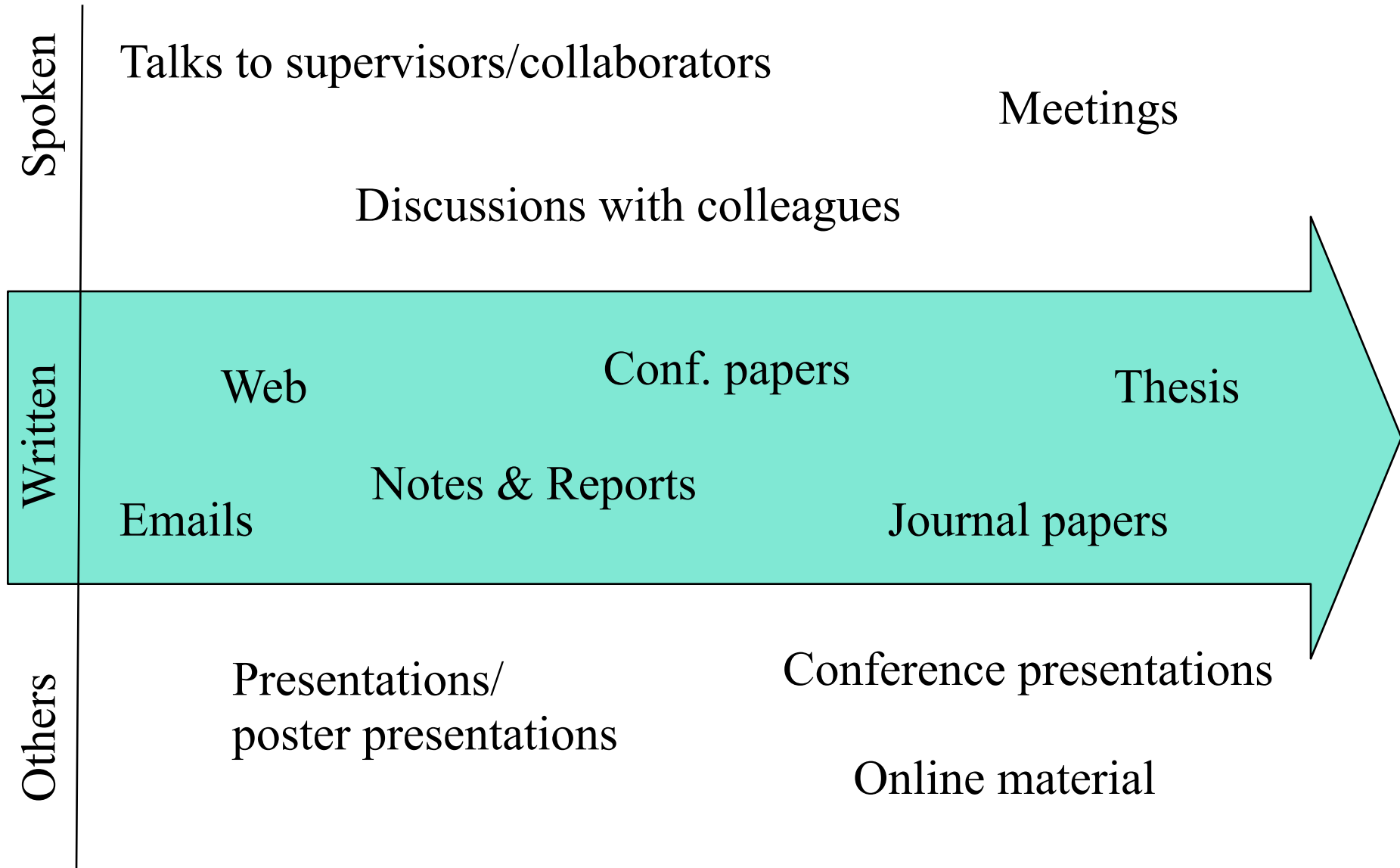
Written
- Emails
- Web pages
- Notes and Reports
- Conference papers
- Journal papers
- Books
- Theses
- . . .

Spoken
- Discussions with colleagues
- Talks to supervisor/ collaborators
- Informal meetings
- Formal meetings (with business partners/ thesis defense)
- . . .

Other (multimedia)
- Poster presentations
- Conference talks
- Videos
- Pod casts
- Online material (presentations, etc..)

Communication in research projects - Timeline

Spoken

Talks to supervisors/collaborators

Meetings

Discussions with colleagues

Written

Web

Conf. papers

Thesis

Notes & Reports

Emails

Journal papers

Others

Presentations/
poster presentations

Conference presentations

Online material

Communication

Communication in technical or scientific communities is frequently a weak point when compared to fields such as Arts & Humanities, Business, Show business

Communication is important for
- spreading new ideas
- compare and confront current theories and ideas
- change perspective and receive new inputs
- instruct and educate people
- . . .

There will be four lectures (including this) on this topic

Writing

An extremely **important** (and often underestimated) **phase** in a research project

• The official and lasting means of transferring your knowledge, experience, scientific findings

• A way of finalizing the creative effort of research

• A way of testing your own ideas by formalizing them in a sequential, logical and understandable form
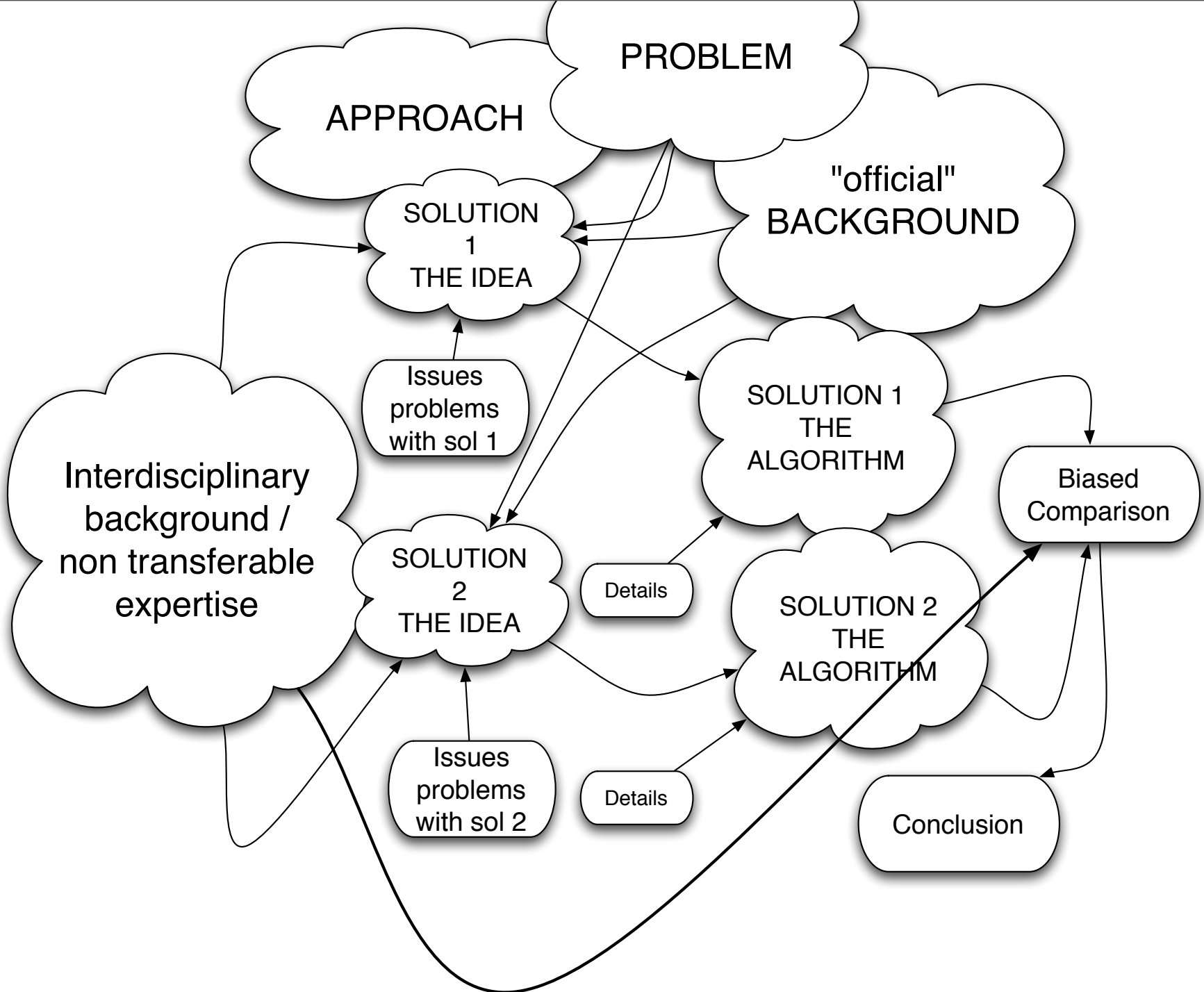
Writing

 It involves the **selection** of the relevant information that capture the essence of a research project

It involves the **organisation** of material and knowledge in a **sequential and logical order**

It requires that all statements are justified, **non-speculative**

Example

Introduction

- Description of previous work
- Review of limitation in state-of-art knowledge
- Suggestion of the new idea, novel approach etc

Method

- Better specification of problem
- How to implement the new idea
- Description of additional choices

Results

- Presentation of results and statistics without comments

Analysis

- Interpretation of results
- Further analysis

Discussion & conclusion

- Comments on the relevance of results
- Conclusion outlining the main messages
- Perspective in the field and future work

IMRAD - Purpose of Introduction

- Introduce the reader to the topic, giving the necessary background in the most understandable form

- Convince the reader that the topic is relevant, the problem deserves attention and we are tackling a fundamental aspect

- Convince the reader that our idea is good and the rest of the paper interesting

IMRAD - Purpose of Method

- Explain previous work/implementation in detail

- Explain your approach/implementation in detail

- This part is essential for reproducing an experiment in your paper or understanding the set of assumptions and precise scope of your work

- This part should explain in detail the novelty that has been introduced : extra detail should not be left for the results

IMRAD - Purpose of Results

• Describe in a rigorous way experimental results or analytical evidence

• Provide numerical / statistical / mathematical evidence to support the claim made previously

• Offer comparison with previous approaches

• Results should not be commented here to convey impartiality

IMRAD - Purpose of Analysis

- Interpretation of results to focus on the advantage / peculiarity of the proposed approach

- Narrow the focus on the "neat" or "desired" aspects of the proposed approach

- Offer the reader a critical (could be also negative) explanation of numerical or raw results

- It contains a chosen set of aspects, therefore it is **biased**

IMRAD - Purpose of Discussion & Conclusion

• It follows logically the analysis to draw general principles and considerations

• Helps the reader to abstract from the detail and see the relevance of the work in the field (link to introduction)

• Summarises the main messages in a compelling and short way

• Suggests future work

Art
The ~~Science~~ of Writing

The process of writing is a **difficult activity**, initial results can be frustrating and unsatisfactory

Some common problems:

• Sentences are not clear (to the reader)
• Sentences do not follow an order that appears logical to the reader
• Some concepts are not outlined (or repeated) sufficiently and escape the readers attention
• Some concepts are repeated more than necessary

The Art of Writing - II

Difficult points for the writer's eye are not necessary the difficult points for the reader's eye

The writer needs to take the reader through a process of understanding, step by step and in a short time (in comparison to the length of the research)

Good writers are good psychologists

The Art of Writing - III

When the writer **is not** a good psychologist...

- The reader misses out the main, important points of the paper
- The reader does not follow properly the line of thought
- The reader does not see why something is explained there and how it fits in the general picture
- The reader becomes hostile to the paper

Although the paper is perfectly clearly and fine to the writer!

Writing - Tips

Look at how other people have constructed theses/project reports/journal articles/conference papers, etc.

There is usually a style which authors tend to fall into. Try to assimilate the style by looking at a lot of previous work

BUT
Always give priority to your own judgement over conventions, use or practice

Reference books eg
Chicago Manual of Style

Writing - Tips - II

Looking back at your work after a couple of days or a week will help you see its weaknesses

Be a psychologist to yourself too:

to rewrite a paragraph is a big effort.

We could be inclined to believe that -- at a second glance -- the meaning is clear... after all, and leave it like that.

The harder and longer we try to write, the less is the time spent looking out of the window

Writing - Tips - III

- Use short sentences (or at least fairly short sentences) where possible
- Use dictionaries and **especially a thesaurus**
- Do not use contractions – "don't" should be written as "do not"
- Abbreviations (although extremely familiar to the writer) require extra effort for the reader. Use them as little as you can
- Do not use jargon, slang, gobbledygook

Writing - Tips - IV

For conferences and journals

Read over and over the **instructions to the authors**

Be aware that terminology and misinterpretation of words/terms cause misunderstanding and reviewers' annoyance or hostility

➡ understand the appropriate terminology for the field

Biased and hostile reviewers tend to focus on marginal weak points to discredit the whole work. i.e. typos :

➡ do not underestimate any aspect!