Professional Basic English
Lecture 9

Jari Korhonen

jari.t.korhonen@ieee.org

Scientific writing

- Writing scientific papers to journals or conferences is the most important way to share your research work
  - Formal dissemination and archiving (today, typically electronic databases such as IEEE Xplore or ACM Digital Library)
  - Lasting reference to the other scientist (and you)
  - Number and impact of your papers is an indicator of your professional status and achievements as a scientist
- Writing a good scientific paper is challenging
  - It should clearly motivate your work, communicate the results and still not be too complex and overloaded with difficult details
  - Ideally, even newcomers in the field can understand the paper

Structure of a scientific paper

- Abstract (short summary of the work)
- Introduction (context and motivation of the paper)
- Literature review (background for the work)
- Body of the paper
  - Methods, materials, preliminaries
  - Results, discussion of the results
- Conclusions (summary of the main observations)
- References (typically in a specific format)

Classroom task 1

- Have a look at the three scientific papers shared in WeChat. Can you find the different parts of the paper, related to the structure mentioned above? Which section belongs to which part?

Order of writing

- Recommended to start with the body (methods and results)
  - Describes the actual work you have done: “what” and “how”?
- Introduction and literature review should support your methodological choices and motivate your research
  - Answers the questions “why”?
- Conclusions and abstract usually written last
  - You can of course write a preliminary abstract in the beginning of the writing process, but you should be ready to revise it in the end
  - Conclusions summarize the main findings and “lessons learned”
  - Abstract is the paper in a very concise form: summarizes the main points

Types of scientific papers

- Conference papers
  - Usually rather short papers (4-8 pages), accompanied with a presentation in a conference (oral speech or poster)
  - Typically peer-reviewed, fixed deadlines and relatively fast review process
- Journal papers
  - Usually longer and more comprehensive than conference papers
  - Longer peer-review cycle, possibly with two or three rounds of revisions
- Technical reports
  - Not peer reviewed, published usually online
  - Sometimes preprints of conference or journal papers submitted for review

Conventions of scientific writing

- Use plural form to refer to the author(s) (“*we*”, “*our*”)
  - Passive voice (“was observed”) also acceptable, especially if the action is clearly more essential than who performed the action
- Avoid using direct quotations
  - Direct quotations in parenthesis, and only if it is absolutely necessary
  - Paraphrasing avoids being caught in plagiarism detection system
- Use proper citation style
  - Usually template available as a model
- Aim for clarity
  - Omit redundant words, avoid separation of subject and verb, etc…

Classroom task 2

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

Classroom task 2 a)

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

Daugman is the inventor of the most successful commercial iris recognition system at the moment and published his results in 1993.

Classroom task 2 b)

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

On wireless and mobile links temporary and long lasting reductions in the available capacity frequently occur.

Classroom task 2 c)

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

Experimental results show about 0.5 dB performance increase as compared to no data partitioning.

Classroom task 2 d)

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

Recently, there has been great interest in incorporating the human perception in video coding systems to enhance the perceptual quality of the represented visual signal.

Classroom task 2 e)

- Read the sentences and suggest how to paraphrase them (i.e. express the same idea in a different way)

Deep learning algorithms have achieved the state-of-the-art performance for image classification and have been used even in security-critical applications, such as biometric recognition systems and self-driving cars.

Crafting a good title

- Good title and good abstract attract attention and persuade readers to read the rest of the paper (the first impression!)
- Good title is descriptive, but not too long
  - Too general title does not differentiate your paper from related papers
  - Too specific title does not interest readers who are not experts in the topic
- Functions of a good title
  - Predicts the content
  - Catches reader's interest
  - Contains essential keywords for search engines

Classroom task 3

- Read the attached three titles and abstracts summarily
- Which titles and abstracts belong together?
- What is your opinion about the titles? Do they give a clear idea of the work? Are they too specific?

Homework 3

- Read the paper shared in BlackBoard and answer the questions related to the paper (multiple choice / open question)
- Deadline: 19. November

Summary

- Scientific publishing is the main way to share new knowledge
  - Number and quality of publications is a success criterion for scientists
  - Publication is a permanent and citable record of scientific work
- Publications follow certain typical conventions
  - Different templates for different journals and conferences
  - Typical structure: title, abstract, introduction, literature review, body (methods, results and discussion), conclusions and references
- Title is an essential part of a paper
  - Attracts readers' attention, summarizes the essence of the paper