Research Methodology

Lecture 3: Paper writing

Professor: Dr. Libertario Demi
libertario.demi@unitn.it
Why papers?
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- To put things into writing helps your own understanding of the subjects
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- Helps future researches in continuing the journey
- Creates a track record of the work done relatively to a specific subject
Where to start

• Always consider the audience
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  - Read what has been published before in a specific journal (conference)
    1. Understand the scientific background
    2. Understand the language
    3. Understand the audience of the journal (conference)
Where to start

• Kinds

1. Short-papers (extended Abstracts)
2. Conference paper
3. Invited talks
4. Letters
5. Technical Report
6. Journal (original research) Paper
7. Fast-track submissions
8. Review paper
9. Books
A good paper must

• Be clearly written (language, structure, communication)

• Be Reproducible (it should be checkable)

• Clearly state the novelty (what is special about this paper)

• Add to the field (prove the sense of this novelty)

• Reference to previous work (show awareness and knowledge of the field, help future researchers navigate through the literature, acknowledge and promote the work done by others)
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Check-list

Practical example

- What is my goal? I want to improve the frame rate in ultrasound imaging
  - Why? It is of interest for cardiac imaging
  - How is it done today? Parallel receive beamforming
  - What are the limitations? It does not apply to harmonic imaging, it deteriorates spatial resolution
  - What did I try to do? I try to use focused beams and OFDM
  - What have I done? I tested the impact of different parameters on key imaging features and compared the performance of my approach with the existing approach
  - How did I did it? Numerically and Experimentally, provide all the details. Software used, parameters tested, instruments used.
  - How could I have done it? I could have done it with coding but..., I could have done it by spatial distribution but..
  - What will I do next? I will test it in-vivo
  - Does my colleague grasps what this is about?
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Repeat and refine

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• Appendixes: free choices, but length has its costs
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- **Appendixes**: people that want to reproduce the work done
Practical tips

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• To find the references:
  • Ask people: colleagues, supervisor.
  • Read the literature
  • Use the references in the literature
  • Use, e.g., Scopus (check who has been citing your references)
### Practical tips

#### Document titles

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
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<tr>
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<td>Implementation of parallel transmit beamforming using orthogonal frequency division multiplexing: achievable resolution and interbeam interference</td>
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<td>Ghalampour, A., Sakhaei, S.M., Andargoli, S.M.H.</td>
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