Scientific communication

in the XXIe century

Mathieu Lagrange





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- as it closes the loop of the scientific method
- ← can be tedious and boring
- ← need to stay focused



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- Audience
- Structure
- Process
- 4 Diffusior
- 6 Reproducible research



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Diffusion

- The goal of writing a paper is to change people's behavior: for instance, to change the way they think about a research problem or to convince them to use a new approach.
- E Determine your goal (also known as your thesis), and focus the paper around that goal.



Know your message, and stay on message (Michael Ernst)

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- ⊱ that you solved it.



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- What are the key points you want a reader person to take away from your paper?



- Who will read your paper?
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- Start with what
- But don't omit why.
- It is not enough to state how an algorithm works; you should explain why it works in that way, or why another way of solving the problem would be different.
- Similarly, it is not sufficient to present a figure and merely help the reader understand what the figure says. You must also ensure that reader understands the significance or implications of the figure and what parts of it are most important.

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Keep things nice and clean

"By focusing on clarity in your writing, you will inevitably gain clarity in your thinking."

Michael Ernst



Structure



Canonical structure (Jennifer Widom)

- ⊆ Title
- ⊆ Abstract
- ⊱ Introduction
- Related work
- ⊱ Body
- Experiments
- ⊱ Future Work
- ⊱ Citations



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- At the end if it can be summarized quickly early on (in the Introduction or Preliminaries), or if sufficient comparisons require the technical content of the paper. In this case Related Work should appear just before the Conclusions, possibly in a more general section "Discussion and Related Work".



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- A clear new important technical contribution should have been articulated by the time the reader finishes a quarter of the paper.
- Every section of the paper should tell a story. and just tell the story of the results themselves.
- The story should be linear, keeping the reader engaged at every step and looking forward to the next step.
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Process



- Consistent names Refer to each character (algorithm, concept, language) using the same word everywhere. Give a significant new character a proper name.
- Subjects and verbs Put your important characters in subjects, and join each subject to a verb that expresses a significant action.
- Information flow In each sentence, move your reader from familiar information to new information.
- Emphasis For material you want to carry weight or be remembered, use the end of a sentence.
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- Focus on the process, not the product Don't worry about the size or quality of your output; instead, reward yourself for the consistency and regularity of your input.
- Prewrite Don't be afraid to think before you write, or even jot down notes, diagrams, and so on.
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Step 0

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- Be sure you have a minimum of 2 hours (4 hours is good) in front of you, without any interruption (close your email box and so on)
- be in a place you like working
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Reproducible research

Step 1: Filling the white document fast

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- If you have made a talk or a poster, start by copying/pasting the talk/poster into a document
- Make very nice and clear graphs and/or tables for the different sections
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Reproducible research



- Revise your writing of the results and interpretation sections.
- Check out/rewrite the hypotheses (at the end of the introduction) and come back to the results description, then hypotheses again: make the two coherent. You do not change your hypotheses, but you revise them to emphasize important aspects of the results (or absence of results).
- Write/Revise the 2 sentences at the end intro/beginning method about your main and important finding.



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Do not work on the paper for 1 or 2 days



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- If you are in graduate school (or you are a professor), go back to Step 5 and loop steps 5-10 at least three times
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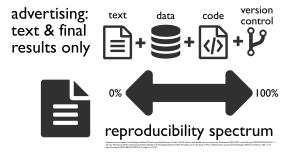


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Reproducible Spectrum



science: text, code & data available, linked & licensed





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