# Writing a Paper

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# The Scope of a Paper

1. Three Basic Questions：

- What did you want to achieve?
- What problems did you expect to address?
- What makes the problems interesting?

2. Define the scope of the work

- What to include in the work?
- Specific questions to be answered?

# The Scope of a Paper

3. Focus on investigation of a small number of specific questions

4. Get suggestion of your core contribution of the work based on preliminary experimental or theoretical result.

5. Answer these questions :

- Which results are the most surprising?
- What is the one result that other researchers might adopt in their work?

# The Scope of a Paper

- Are the other outcomes independent enough to be published separately later on?
- Are they interesting enough to justify their being included?
- Does it make sense to explain the new algorithms first, followed by description of the previous algorithms in terms of how they differ from the new work? Or is the contribution of the new work more obvious if the old approaches are described first, to set the context?
- What assumptions or definitions need to be formalized before the main theorem can be presented?
- What is the key background work that has to be discussed?
- Who is the readership? For example, are you writing for specialists in your area, your examiners, or a general computer science audience?

# Telling a Story

- A strong thesis or paper has a story-like flow, with a sequence of concepts building from a foundation of knowledge assumed to be common to all readers up to new ideas and results.
- Thus an effective paper educates its readers. It leads readers from what they already know to new knowledge you want them to learn.
- For this reason, the body of a good paper—everything between the introduction and the conclusions—should have a logical flow that has the feel of a narrative.

- The story told by a paper is a walk through the ideas and outcomes that explains the material in a structured way.
- The first parts of the paper teach the readers the things they need to understand for the later parts,

# Structuring The Body of A Paper

- Structuring by Chain:
  - a problem statement,
  - then a review of previous solutions and their drawbacks,
  - then the new solution,
  - and finally a demonstration that the solution improves on its predecessors.
- Structure by Specificity:
  - The material is first outlined in general terms (General Architecture), then
  - the details are progressively filled in (Explaining every elements).
  - Results divided into several stage,

- Structuring by Example
  - The idea or result is initially explained by, say, applying it to some typical problem.
  - Then the idea can be explained more formally, in a framework the example has made concrete and familiar.

- Structuring by Complexity
  - a simple case can be given first, then a more complex case can be explained as an extension, thus avoiding the difficulty of explaining foundational concepts in a complex framework.
  - This approach is a kind of tutorial: the reader is brought by small steps to the full result.

# Organization

- Scientific papers follow a standard structure that allows readers to quickly discover the main results, and then, if interested, to examine the supporting evidence.
- Many readers accept or reject conclusions based on a quick scan, not having time to read all the papers they see.
- A well-structured write-up accommodates this behaviour by having important statements as near the beginning as possible.

# Organization

- What u need to do :
  - Describe the work in the context of accepted scientific knowledge.
  - State the idea that is being investigated, often as a theory or hypothesis.
  - Explain what is new about the idea, what is being evaluated, or what contribution the paper is making.
  - Justify the theory, by methods such as proof or experiment.