Writing a research paper
Organizing a research paper

• Decide up front what the point of your paper is and stay focused as you write

• Once you have decided on the main point, pick a title

• Start with an outline

• Use multiple levels of headings (usually 2 or 3)

• Don’t ramble!
Typical paper organization

• Abstract - Short summary of paper

• Introduction - Motivation (why this work is interesting/important, not your personal motivation)

• Background and related work - Sometimes part of introduction, sometimes two sections

• Methods - What you did; in a systems paper you may have system design and evaluation sections instead

• Results - What you found out

• Discussion/Conclusions - May include conclusions, future work, discussion of implications, etc.

• References

• Appendix - Stuff not essential to understanding the paper, but useful, especially to those trying to reproduce your results - data tables, proofs, survey forms, etc.
Road map

- Papers longer than a few pages should have a “road map” so readers know where you are going.
- Road map usually comes at the end of the introduction.
- Tell them what you are going to say, then say it, (and then tell them what you said).

Examples

- In the next section I introduce X and discuss related work. In Section 3 I describe my research methodology. In Section 4 I present results. In Section 5 I present conclusions and possible directions for future work.
- Waldman et al, 2001: “This article presents an architecture for robust Web publishing systems. We describe nine design goals for such systems, review several existing systems, and take an in-depth look at Publius, a system that meets these design goals.”
Use topic sentences

- (Almost) every paragraph should have a topic sentence
  - Usually the first sentence
  - Sometimes the last sentence
  - Topic sentence gives the main point of the paragraph

- First paragraph of each section and subsection should give the main point of that section

- Examples from Balebako et al, 2015
  - In this section, we provide a brief background on policy in the United States regarding smartphone data collection.
  - Smartphones have characteristics that distinguish them from personal computers (PCs), and impact the harms and concerns from data sharing.
Avoid unsubstantiated claims

• Provide evidence for every claim you make
  – Related work
  – Results of your own experiments

• Conclusions should not come as a surprise
  – Analysis of related work, experimental results, etc. should support your conclusions
  – Conclusions should summarize, highlight, show relationships, raise questions for future work
  – Don’t introduce completely new ideas in discussion or conclusion section (other than ideas for future work)
  – Don’t reach conclusions not supported by the rest of your paper