

Lecture03a: Research

CS540 1/30/18

Announcements

On-campus students:

- Make sure I am wearing the microphone
- We are going to start using the 2nd microphone for questions

All students:

- Project 1 will be assigned today; due Thursday, Feb 15.

2nd reading assignment: M. Contreras-Cruz, V. Ayala-Ramirez, and U. Hernandez-Belmonte. *Mobile robot path planning using artificial bee colony and evolutionary programming*. Applied Soft Computing 30(2015):319-328

Why do we write papers?

To teach the reader

- To define a new problem
 - Argue that it is novel
 - Argue that it is important
- To present a new technique or algorithm
 - Argue that it is novel
 - Present data showing it is better than SOA
- To present a new analysis
 - Argue that the analysis is novel
 - Teaches us something new about the problem or previous techniques
- To present new tools or data sets
 - Argue that the tool/data set is novel
 - Explain how it will help the reader and/or field
- To survey the field
 - Quickly bring readers "up to date"

Why do we present papers?

It's a commercial!

Convince the audience to read your paper!

- Motivation : why your work is important
- Conclusion : what is the take away message?
 - What should they learn
- Methodology : just a hint
 - So they know what to expect in the paper

For some audience members, audio/visual presentations are more memorable than papers

- So emphasize the conclusion

How do we write papers?

No surprises. We use the following outline:

- Abstract : one paragraph
- Introduction
 - What problem are we addressing
 - Why is it important
 - What is your contribution
 - What will you conclude
- Background
 - Review previous work
 - Compare to your approach
- Methodology
 - Describe your approach in detail
 - Identify the contribution
 - Describe experimental design
- Results
 - Present experiment data
 - Describe results – tell user what to conclude
- Conclusion : re-emphasize contribution, identify future work

What should your paper say?

Think about the introduction:

- What problem are you solving?
 - Which algorithms are you comparing?
 - Are you modifying them?
 - What conditions are you comparing them under?
- Why this combination of algorithms and conditions?
 - What makes it interesting?
 - What is your contribution?
- What is your contribution?
 - What question or hypothesis do you address?
 - How will you measure success?

You will add (4) *What is your conclusion* later

What else?

Literature review

- Where do your algorithms fit within scheduling/search?
 - Compare
- How do your algorithms/tasks differ
 - Contrast
- The compare/contrast should relate to what was interesting...

Methodology

- Don't tell me about the code, unless there is a reason to
- Describe your contribution
- Describe initial conditions, performance measures
- Describe experimental method

Still More...

Results

- This is why you have to write the code
- Describe the results of your experiments
 - Tables are highly recommended
 - Figures are highly recommended
- Tell the user what they should conclude
 - And why

Conclusion

- Don't recapitulate Sections 3 & 4
- Highlight the most important contributions/results
- Suggest future work