Research Methods in computer science

Fall 2015

Lecture 4

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September 2, 2015

Agenda

Research Paper Anatomy (Contd.)

Critique

Assignment

Anatomy of a Research Paper

Abstract

Introduction

Related Work

Design and Implementation

Evaluation

Conclusion

Some of the contents in the next few slides from Jennifer Widom's notes on Writing Technical Papers.

Abstract

Summary of motivation, state of the art, your algorithm or system, and results each in 1-3 sentences.

Introduction

What is the problem?

Why is it interesting and important?

Why is it hard? (E.g., why do naive approaches fail?)

Why hasn't it been solved before? (Or, what's wrong with previous proposed solutions? How does mine differ?)

What are the key components of my approach and results? Also include any specific limitations.

Summary of results and contributions.

Related Work

You want to give a sense of the old and new work in this area.

Where to look for these?

Organized is better than not organized

The Body of the paper

Depending on the area of work may describe the proposed algorithm, proofs, systems, implementations

Evaluation

Description of experiments and metrics

Results of experiments

Implications of those results

More applicable to the applied areas of computer science.

Conclusions

Not the same as abstract

Short summary of what you did in the project and the implications of the results

Can include lessons learnt and future directions

How do the answers map to these questions to the different parts of a paper?

Types of Papers

- Technical Reports
  - Project description
  - Research paper
- Conference
- Journal
- Magazine

Find out what type your group and community writes.

Which papers are more important?

Conference

Journal

Magazine

What makes a paper more important than others?

Critique

Critique is a method of disciplined, systematic analysis of a written or oral discourse. Critique is commonly understood as fault finding and negative judgment, but it can also involve merit recognition, and in the philosophical tradition it also means a methodical practice of doubt. – (Wikipedia)

Coping with Criticism

Keep it professional

Don't take it personally

Understand it

Respond at the right time

Challenge as appropriate

http://ckscience.co.uk/candidate/career-zone/work-place-advice/5-ways-to-deal-with-criticism-at-work/

Do unto others as you would have them do to you. – (lots of places)

A Paper Review

"While the exercise is useful, the paper does not have any new concepts or implementation caveats that I think are worth publishing. All of the design description seems straightforward integration of existing systems. The evaluation is also very weak."

--- excerpt from a review received by the instructor

A Paper Review

"Despite the limited practical applicability, I find the paper interesting for the sheer courage to try something out of the ordinary and to properly explore its limits."

-- excerpt from a review received by the instructor

HW2 - Research Formulation

What are you trying to do? Articulate your objectives using absolutely no jargon.

How is it done today, and what are the limits of current practice?

What's new in your approach and why do you think it will be successful?

Who cares?

Heilmeier

HW2 - Research Formulation

If you're successful, what difference will it make?

What are the risks and the payoffs?

How much will it cost?

How long will it take?

What are the midterm and final "exams" to check for success?

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