

Research Methods in computer science

Fall 2021

Lecture 19

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Agenda

Conference updates

Idea generation

Reading and tracking papers

HW8

Generating Research Ideas

“Standing on the shoulders of giants”

Most ideas may not be new

New may be subjective

Adding a layer to an existing deep learning architecture

When is it new?

When is it not new?

Idea Generator Heuristics

Combination / Hybrid techniques

From the same discipline

(e.g.,)

From a different discipline

(e.g.,)

Address Gap/limitation (Incremental?)

Handle some cases that were not handled

Improve some (partial) aspects of dimension

Apply different datasets / settings / contexts

Class Activity

Pick an important paper

Generate a derivative idea for a paper

Present

- Idea on the original paper

- Derivative idea and its relation to the original paper

How to Read a Scientific Paper

Begin with introduction, not abstract.

Identify the big question

Summarize the background in five sentences

Identify the specific questions

Identify the approach

Read the methods section

Read the results section

Determine if the results answer the questions

Read the conclusions/discussion/interpretation section

Read the abstract

Find out what others say about the paper

https://www.huffingtonpost.com/jennifer-raff/how-to-read-and-understand-a-scientific-paper_b_5501628.html

How to read a research paper

Goal is to understand the scientific contribution

Read critically

Question the study, approach, ...

Read creatively

Extrapolate, extend, generalize, ...

Make notes

Summarize

Compare

<https://www.eecs.harvard.edu/~michaelm/postscripts/ReadPaper.pdf>

How to Read a Paper

First pass [5-10 mins]

High level idea, category, context, contributions

Second pass [1 hr]

Some results, key ideas of the paper and key evidence

Third pass [variable]

Attention to detail, re-create the paper

<http://ccr.sigcomm.org/online/files/p83-keshavA.pdf>

How to Read an Engineering Research Paper

Read to answer questions

1. What are motivations for this work?
2. What is the proposed solution?
3. What is the work's evaluation of the proposed solution?
4. What is your analysis of the identified problem, idea and evaluation?
5. What are the contributions?
6. What are future directions for this research?
7. What questions are you left with?
8. What is your take-away message from this paper?

From “Where” to Read Papers?

Conferences? Which?

Journals? Which?

From where else?

Paper Notes / Tracking

Things worth remembering

Results, Ideas, Authors,

Electronic systems [Mendeley?...]

Could be integrated with References

Some groups have shared bib files

Plain text file may be enough

HW9

Consolidate your paper into a single document

Improve one section of the paper

Submit before/after of the section you improved