Research Methods in computer science
Fall 2021

Lecture 19

Omprakash Gnawali
October 27, 2021
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

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

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 deal, re-create the paper

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