Research Methods
in computer science
Spring 2020

Lecture 20

Omprakash Gnawali
April 6, 2020
Agenda

Talk Critique
Generating Ideas
Reading Papers
Conference Updates
We had discussion with Jaspal Subhlok on talks and presentations. This was a follow up from last week’s lecture.
Some Practical Points about Talks

Managing questions
References slides
Slide numbers
Type/number of examples
What to do when reaching time limits
What if people get up and leave?
What is the most important thing that matters as a speaker?
Is there a dress code?
How to shorten a talk?
How much details to put in a talk?
Should I maintain eye contact?
How to talk about weakness of the work?
Input from Students on Things to Improve

Confidence
Humor
Develop good knowledge of the topic
Provide clear idea
Illustrations and Images
Good organization
Tailor to the audience
Lots of Practice
Record and watch
Speak slow and clearly
Smartly deal with malicious questions
Good time management
Fluency
Logical order
Have good research result
What worked well in a Recent Talk

Conveyed good knowledge of the topic
Volume was loud
Detailed explanation
Lots of diagrams and graphs and visuals
Confidence of the speaker
Always smiled
Basics was covered
Logical organization
Maintained map of the talk
Explained the topic well
What didn’t work well in a Recent Talk

Slow
Too basic
Didn’t explain some topics well
Some illustrations/graph not intuitive
Didn’t highlight key ideas
Too much content
Too many jargons
Poor time management
We had a student share his/her recent presentation experience.
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
In Class Activity

Idea Generation

Pick an important paper in your area of research.

Consider three different ways to generate research based on the paper you picked and generate one idea per technique.

Explain the heuristics and demonstrate how you use the heuristics to create a new idea.
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
Conference Updates

Paper submission deadline this Friday
Review and other logistics