# Reading Papers

# A Recipe

- Read the paper at least three times (3 step process)
- In each step focus on different parts and try to answer different questions
- At the end of each step pause and think about what you read and the answers you found

# First Step

Read the Abstract, Introduction and Conclusion

- Look for motivations
- Determine the problem statement and the approach used to solve it
- Classify the paper:
  - Is it methodological, conceptual, theoretical (verbal or mathematical), empirical?
  - Is it a survey, a novel theoretical contribution, an empirical application of an existing theory or technique?

# Second Step

- Skim the body of the paper
  - Determine the Purpose, Structure, and Direction
  - Skipping equations, most figures and tables
  - Note the part that you found confusing and return to them later to see if the rest of the paper made them clear
- Try to summarize the paper in one or two sentences
- Read the previous/related work
  - Determine how authors relate their work to the state of art (what are the novelties of their work?)

# Three Step

1. Read the whole paper carefully
    - Focusing on the sections or areas that seem most important
    - Identify the main points, the strengths, and the weaknesses
    - Try to write a deeper, more extensive outline of the main points of the paper to gain insight into more specific details: assumptions made, arguments presented, data analyzed, and conclusions

# Three Step

2. Critique the paper

    - What the paper describes makes sense?
    - Is the paper internally consistent well supported by arguments or evidences?
    - Are the assumptions that motivate this paper sound and reasonable?
    - What are the limitations of the presented solution?
    - Is there some simple solution that the authors may have overlooked?

# Three Step

2. Critique the paper

- If the authors present data:
  - Did they gather the right data?
  - Did they appear to gather them in the correct manner?
  - Did they interpret the data in a reasonable manner?
- If the authors present a practical evaluation:
  - Is the code available?
  - Is possible to validate the experiments?
- What questions are you left with? Is anything unclear?

# Questions After The Three Steps

- What is your take-away message from this paper?
- What is the motivation for this work (both people problem and technical problem)?
- What is its distillation into a research question?
- What is the proposed solution (hypothesis, idea, design)?
- How is the solution achieved?
- What is the authors' evaluation of the solution?
    - What logic, argument, evidence, artifacts (e.g., a proof-of-concept system), or experiments are presented in support of the idea?

# Questions After The Three Steps

- What weaknesses do you perceive in the work?
- What are the most interesting or controversial ideas?
    - For papers with practical implications: ask whether this will work; who would want to use it; when might it become a reality?
- What questions would you like to raise in an open discussion of the work (review interesting and controversial points, above)?
- What do you find difficult to understand?

# What put in the report?

- Summary of the paper
- Motivations
- Contributions
- Methodology
- Conclusion
- A Small Analysis
  - Possible strengths & weaknesses
  - How do you think it is possible to improve/extend the work