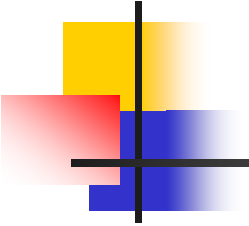


How to Read a Research Paper

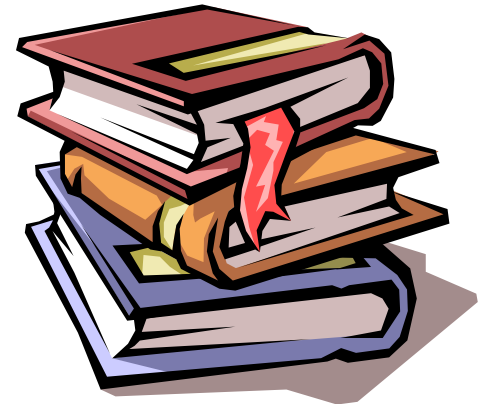
Adapted from William G. Griswold's advice on "How to Read an Engineering Research Paper"

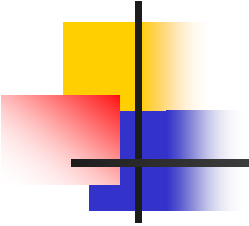
<http://www-cse.ucsd.edu/~wgg/CSE210/howtoread.html>



Before reading a research paper

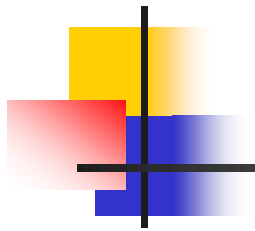
- Reading research papers *effectively* is challenging
 - Why?
 - Condensed style, focused audience, paper organization
- To effectively read papers you should know:
 - What you should get out of the paper?
 - Where that information is located?





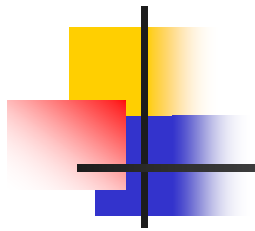
How Research Paper is Organized

- The technical papers are repetitive in nature!
- Introduction = motivation + solution outline
- Related Work
- Body of the Paper
 - Details on the solution
 - Detailed evaluation
- Discussion of the results
- Conclusions (recap of contributions and results)
- Because of these repetitions, you can read the paper 'out of order'



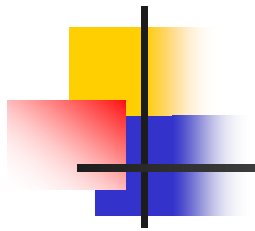
Questions You Want to Answer (1)

- What are the motivations for this work?
 - A published paper solves the problem and no one else has published in the literature
 - Why there is no trivial solution to this problem?
 - What are the previous solutions and why are they inadequate?
- Specific research questions?
 - Motivation and statement should lead to this
 - This does not always happen - your job is a bit more difficult in that case



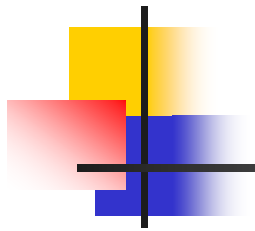
Questions You Want to Answer (2)

- What is the proposed solution?
 - Hypothesis (until it has been evaluated) or idea
 - Why is this solution better than previous solutions?
 - How the solution is achieved (design, implementation)?
 - Is it achievable at all? To which extent?



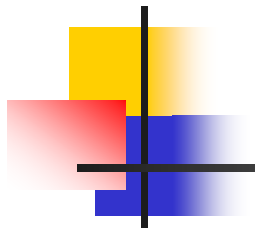
Questions You Want to Answer (3)

- What is the work's evaluation of the proposed solution?
 - Just having an idea is not sufficient anymore (although it used to be a few years ago ...)
 - This is a concrete engagement of the research question (e.g., numbers)
 - Under which circumstances does it work (e.g., numbers) ?
 - What benefits and problems are *identified*?



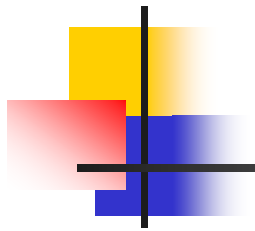
Questions You Want to Answer (4)

- What is your analysis of the identified problem, idea and evaluation? (remember paper reports and subjective evaluation ...)
 - Is this a good idea?
 - What flaws do you perceive in this work?
 - What are the most interesting points?
 - What are the most controversial ideas or points?
 - Is it really going to work?
 - When might it become a reality?



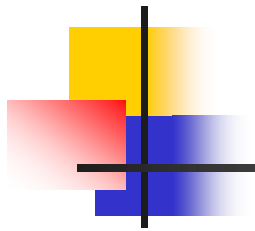
Questions You Want to Answer (5)

- What are the contributions:
 - A new understanding of a research problem?
 - A new methodology for solving a problem?
 - A new algorithm?
 - A new breed of software tools or systems?
 - A new experimental method?
 - A new formalism or notation?
 - A new evidence to substantiate or disprove a previously published claim?
 - A new research area?



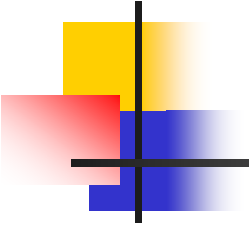
Questions You Want to Answer (6)

- What are the future directions for this research
 - What do authors identify as a future work?
 - What ideas did you come up with while reading the paper?
 - You may get answers to these questions from the analysis of shortcomings or other critiques in the current work



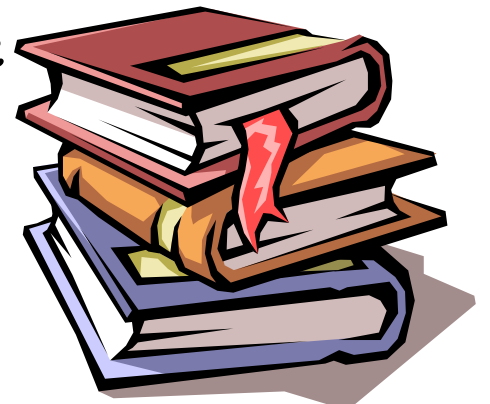
Questions You Want to Answer (7)

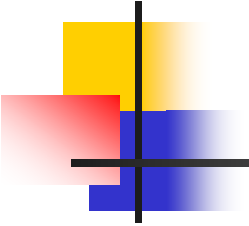
- What is your take-away message from this paper?
 - Sum up the main implication of the paper from your perspective (e.g., from your class project's perspective)!
 - This is also useful for quick review and writing your final project paper!
 - It also focuses you to identify the essence of the work



Mechanics

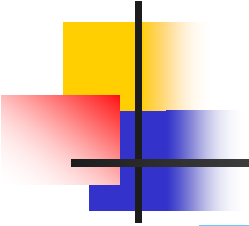
- As you read/skim the paper, actively attempt to answer questions 1-7
- Get motivation from the intro
- Intro & conclusion - the solution and evaluation at a high level
- Body of the paper - all the meat
- Pay attention to the context - other papers that are presented in the class **WILL** be relevant (past or future work for some papers ...)





Want to write a good paper report?

- Use this template: <http://www-cse.ucsd.edu/~wgg/CSE210/paperform.pdf>



Taking Notes on the Paper

Take notes on the paper!

- Highlight important comments.
- Mark paragraphs: motivation, problem, idea/solution, evaluation, contributions
- Front of the paper: take away message
- Front of the paper: your key questions!
Other questions are on the margins.
- Try to answer questions yourself. Use Wikipedia and Google (carefully!)