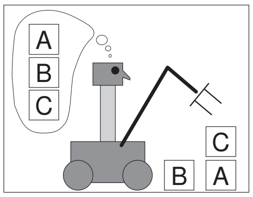

CS640 Fall 99
Research Memo 1: Critiquing Papers
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Peer reviewed papers are at the heart of academic research. People do not work in a vacuum; research projects are not based on isolated ideas. You certainly will be reading papers to assist in your research, and you may very well be reading them as a reviewer. This note is intended to describe some hints/suggestions about the process of critiquing a paper for either purpose. Although I expect both roles to be served by the critiques you write to fulfill your 640 requirement, I'll conclude with some specifics about those critiques.

1 Critiquing for Your Research

You should be gathering ideas for projects and documents whenever you read other people's papers. You can expedite the daunting task of coming up with ideas and summarizing the state of the art in the field by writing summaries of every paper you read that you think might be relevant. Almost every paper includes conclusions, evaluation and/or future work sections. Read these sections carefully; they can give you great ideas for new projects or follow-up work.

While the form and content of personal summaries are up to you, you should emphasize what you learned from the paper. For example, did they have an idea you can use in your own projects? Did they explore something that didn't work that you need to remember? Did they make some mistake you would like to avoid? Did they cite other papers that you should read? Did you find a gap in the coverage of their theory or experiment? Treat the summary as 1) a memory assist, 2) a repository of ideas that might be useful later, and 3) a starting point for writing papers (e.g., literature reviews or comparisons between your project and others). Reading papers helps you avoid repeating the mistakes or even inadvertently copying the good work of others.

2 Reviewing a Paper

Reviewers are selected based on their reputation and knowledge. We are usually asked to review within our specialized area, but occasionally for a broad based venue will be asked to review somewhat outside. Most conferences and journals provide forms to guide reviewers in what is important for their venue. Expectations for journals are usually higher than that of conferences. Conference papers are shorter and allow less time between submission and publication. Thus, we expect them to be about fairly new, not necessarily mature research. The guidelines usually are divided into presentation and content. Presentation significantly colors our view of the work; if the writing is sloppy, we often assume that the science will be as well. The best ideas cannot survive drowning in poor prose. Conversely, beautiful writing cannot compensate for a dearth of good ideas or poor research methodology; reviewers simply have an easier time determining that they can reject the paper.

The standard characteristics sought in papers are:

1. Presentation
   (a) clarity of overall organization
   (b) quality of language/English
   (c) readability
   (d) appropriate level of discourse (terminology understandable by expected readership)
2. Content
   (a) novelty or originality of research
   (b) relevance of research to audience
   (c) significance of research
   (d) adequacy of methodology (e.g., experiments were controlled, theory was sound, decisions were justified)

Depending on the standards of the forum, you may prioritize the characteristics and the level of acceptability. For example, in artificial intelligence, the premier conferences *IJCAI* and *AAAI*, have standards as high as some journals and accept rates lower than many. To give an example, I include a form at the end of this memo that was used for the *Artificial Intelligence Planning Systems Conference* in 1996.

3 General Suggestions about Reading Papers

I've augmented and paraphrased some suggestions from an old report from MIT entitled *How to Do Research at the MIT AI Lab*:

- To write good comments, you need to read the paper twice: once to make sure you understand their point and the second to make specific comments.
- I divide my comments into general (applies to a many parts of the paper) and specific (indicating a problem in a specific paragraph or sometimes section). If the authors consistently make some mistake, correct it in the general section. In the specific comments, include enough information about where the problem is that the authors can pinpoint it.
- Be constructive and concise in your comments. At one point, someone reading a paper of mine resorted to "Aghhh!"; while I got the point that they didn't like it, I had no idea what was wrong.
- If you don't understand something, say so. If you've honestly tried and you are a good example of a typical audience member, you'll be doing the author a favor by pointing out places where the prose or idea doesn't make sense.
- Treat your comments as formal writing. **Spell check and proofread them.** If writing is not your forte, ask someone else to read yours before you hand it in; if they couldn't understand your points, chances are the grader or reviewer won't be able to either.

- **Most important:** Adopt a positive attitude from the first. If the paper was published somewhere, somebody other than just the authors thought it was valuable. It is easy to get jaded reading papers; fight the tendency to use the second definition of "criticize" [1]

4 Expectations for Critiques in CS640

In addition to the comments in the previous sections, I expect 640 critiques to be about 2 pages in length (reasonable format, e.g., single spaced, 11pt font, 1 inch margins, etc.). They should start with a one paragraph summary of the paper, so that I know that you understood the basic points. Comment on both positive and negative aspects of the paper. If it helps early on, you can even make those separate sections in your critique. Try to extrapolate from the paper; think yourself about how it contributes to the field and what should be done as followup. A good critique needs to voice the broader implications. If you think the author missed some important related work, mention it.

Finally, the critique need not cover all possible points that can be made about the paper. Like as not, you'll see different points from others in the class. Focus on what you think is most important and don't worry about covering all the details.

[1] From Webster's: "crit.i.cize: to act as a critic 1: to consider the merits and demerits of and judge accordingly : EVALUATE 2: to stress the faults of".

PART I
AIPS-96 PAPER REVIEW FORM -- COMMENTS FOR THE AUTHOR(S)

PAPER CODE:

PAPER TITLE:

SIGNIFICANCE:
IS THE WORK REPORTED IMPORTANT? DOES THE APPROACH OFFERED ADVANCE THE STATE OF THE ART? DOES THE PAPER STIMULATE DISCUSSION OF IMPORTANT ISSUES OR ALTERNATIVE POINTS OF VIEW?

ORIGINALITY:
ARE THE PROBLEMS OR APPROACHES NEW? IS THIS A NOVEL COMBINATION OF EXISTING TECHNIQUES? DOES THE PAPER POINT OUT DIFFERENCES FROM RELATED RESEARCH? DOES IT ADDRESS A NEW PROBLEM OR ONE THAT HAS NOT BEEN STUDIED IN DEPTH? DOES IT INTRODUCE AN INTERESTING RESEARCH PARADIGM? DOES THE PAPER DESCRIBE AN INNOVATIVE COMBINATION OF AI TECHNIQUES WITH TECHNIQUES FROM OTHER DISCIPLINES? DOES IT INTRODUCE AN IDEA THAT APPEARS PROMISING OR MIGHT STIMULATE OTHERS TO DEVELOP PROMISING ALTERNATIVES?

QUALITY:
IS THE PAPER TECHNICALLY SOUND? DOES IT CAREFULLY EVALUATE THE STRENGTHS AND LIMITATIONS OF ITS CONTRIBUTIONS? ARE ITS CLAIMS BACKED UP? DOES THE PAPER OFFER A NEW FORM OF EVIDENCE IN SUPPORT OF OR AGAINST A WELL-KNOWN TECHNIQUE? DOES THE PAPER BACK UP A THEORETICAL IDEA ALREADY IN THE LITERATURE WITH EXPERIMENTAL EVIDENCE? DOES IT OFFER A THEORETICAL ANALYSIS OF PRIOR EXPERIMENTAL RESULTS?

CLARITY:
IS THE PAPER CLEARLY WRITTEN? DOES IT MOTIVATE THE RESEARCH? DOES IT DESCRIBE THE INPUTS, OUTPUTS, AND BASIC ALGORITHMS EMPLOYED? ARE THE RESULTS DESCRIBED AND EVALUATED? IS THE PAPER ORGANIZED IN A LOGICAL FASHION? IS THE PAPER WRITTEN IN A MANNER THAT MAKES ITS CONTENT ACCESSIBLE TO MOST AI RESEARCHERS?

OTHER COMMENTS FOR THE AUTHOR(S):

PART II
AIPS-96 PAPER REVIEW FORM - CONFIDENTIAL COMMENTS

PAPER CODE:

PAPER TITLE:

REVIEWER:

YOUR RECOMMENDATION:
ACCEPT _____
MARGINAL _____
REJECT _____

YOUR CONFIDENCE IN THE RECOMMENDATION:
HIGH _____
MEDIUM _____
LOW _____

REASONS TO ACCEPT:

REASONS TO REJECT:

SHOULD THIS PAPER BE NOMINATED AS AN OUTSTANDING PAPER? ______
WHY?