

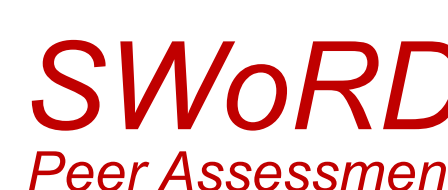
Introduction and Research Goal



- Peer feedback has mixed quality w.r.t helpfulness
- Helpful feedback should **identify problems** in the writing and **provide solutions** [3]



- Instructor guidance and review prompts have limited impact
- Post-hoc identification of low quality-reviews is time consuming



- We are enhancing SWoRD [1] peer review system to help reviewers improve their feedback with **Instant-feedback SWoRD**
- Our initial work focused on improving feedback localization, i.e., localizing where problems occur in a paper [2]
- Our current study enables automatic prediction of presence of problems and solutions in peer feedback

Instant-Feedback SWoRD Interfaces

Analyze Louv's rhetorical strategies - Draft #1

Review Document by AuntLisa

Download Document

Assignment Description

The passage below is from Last Child in the Woods (2008) by Richard Louv. Read the passage carefully. Then, in a well-developed essay, analyze the rhetorical strategies Louv uses to develop his argument about the separation between people and nature. Support your analysis with specific references to the text ...

1. Thesis

Provide feedback on the quality of the author's thesis.

Comment 1: (*Required)

Thesis. Did the author include a clear, specific thesis in his or her introduction?

1 - The author did not include a thesis in his or her introduction

...

Save Submit

Review interface (top to bottom): Assignment description, Comment prompt, Comment box, Rating box

Your comments need to **suggest solutions**: If you point out a problem, make sure that you provide a solution to fix that problem.

I've revised my comments. Please submit.

I don't know how to suggest a solution to a problem. Could you show me some examples?

My comments don't have the issue that you described. Please submit comments.

The thesis is well stated though the points listed in your thesis are not all clearly expounded upon in the body of the essay. Pathos and logos are mentioned only twice throughout the entire essay, not including the thesis statement and ethos isn't mentioned at all a second time.

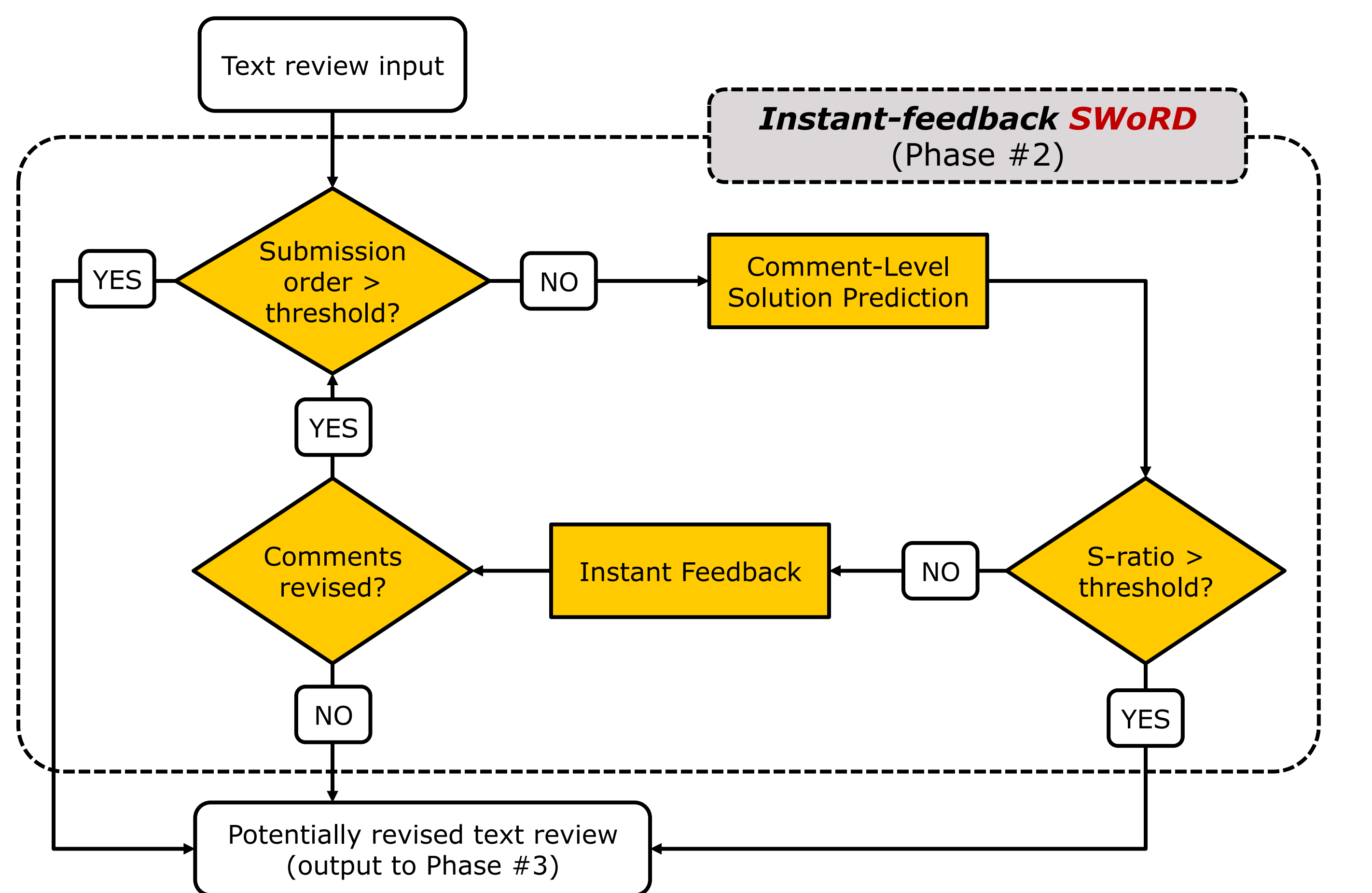
Add solution Already exists? Yes No

The essay is organized in a simple and easy to understand way, with simple language and high vocabulary used, though it would be better to directly state what you will talk about in your body paragraphs in your thesis so they can be more connected.



Instant feedback interface (top to bottom): Solution feedback message, Possible reviewer reaction, Highlighted problem-only and solution comments

Instant-Feedback SWoRD Architecture



S-ratio = solution comments / (solution comments + problem-only comments)
S-ratio was tuned to 0.7 based on results with development data

Comment-level Solution Prediction

Classification Problem

- Predicts review comment's feedback type: Solution, Problem-only, Non-criticism [3]

Feature Sets

- Simple:** word count and order of the comment
- Keywords:** 10 content pattern sets (Solution, Idea, Suggestion, Location, Connective, Positive, Summary, Error, Negation, Negative).
 - Count total occurrence of keywords in each set
- Location phrases:** hand-crafted regular expressions of location patterns (e.g., "on page 5"), location seed words (manually collected, e.g., page, thesis, conclusion), location bigrams (automatically extracted given the location seeds, e.g., "transition paragraph").
 - Count occurrences or matches of location seeds, location phrases or regular expressions
- Paper content**
 - Domain unigrams: extracted from training data using TF-IDF
 - Window size: length of maximal common text span between the comment and the paper
 - Textual similarity: between the comment and the covering, preceding and following sentences the common span

Evaluation and Conclusions

Model Deployment

- 9 high-school Advanced Placement classes in Pittsburgh, PA, Spring 2015
- 134 reviews triggered instant feedback, containing 891 comments: 223 Solution, 340 Problem-only, and 328 Non-criticism

Model	Acc.	Kappa	F1:Sln	F1:Prb	F1:Non	True S-ratio	≤ 1	> 0.7	= 1.0
BoW	0.50	0.24	0.40	0.51	0.57	#reviews	134 (100%)	24 (18%)	16 (12%)
SWoRD	0.62	0.44	0.55	0.59	0.72				

Comment level prediction performance: Our model outperformed BoW baseline

Review level intervention obtained accuracy up-to 0.88

Student Review Revision Performance

- 74 review resubmissions: revised + newly-added comments
- 111 revised comments: 73 fixed from problem-only to solution, 3 edited from non-criticism to solution
- 4 newly-added comments mentioned problems and provided solutions

Conclusions

- Instant-feedback SWoRD achieved high performance in predicting solution in review comments and in triggering instant feedback
- Reviewers provided more solution comments after receiving instant feedback

References

- K. Cho and C. D. Schunn. **Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system.** Computers and Education, 48(3), 2007.
- H. Nguyen, W. Xiong, and D. Litman. **Classroom evaluation of a scaffolding intervention for improving peer review localization.** 12th ITS, 2014.
- W. Xiong, D. J. Litman, and C. D. Schunn. **Natural language processing techniques for researching and improving peer feedback.** Journal of Writing Research, 4(2), 2012.