Enhancing Diversity and Coverage of Crowd-Generated Feedback through Social Interaction

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Abstract

Feedback is critical for helping users improve their creative work in the iterative process. Most studies focus on improving single feedback quality but neglect the overall diversity and coverage. In this work, we conducted a pilot study to investigate how social interaction facilitates crowd collaboration to generate diverse feedbacks. The insight is that presenting others' feedbacks guides workers to produce quality feedbacks from varying perspectives. To enhance diversity and coverage, we propose two possible design features to further support social interaction in reviewing tasks, including a spatially anchored feedback thread and a simple button for one-click agreement.

Introduction

Feedback plays an important role in the iteration of creative work such as writing and visual design. It helps people recognize how others perceive their work, understand the gaps between intentions and interpretations, and gain insights from different perspectives. Good feedback facilitates the work to evolve toward better solutions.

Recent work has shown that crowd-generated feedback improves output quality (Dow et al. 2012; Xu, Huang, and Bailey 2014). However, obtaining high-quality feedback from the crowds remains a challenge. Xu et al. (Xu, Huang, and Bailey 2014) decompose the feedback process into micro-tasks and solicit structural feedbacks for improving poster design. Luther et al. (Luther et al. 2015) adopt learning theory to scaffold non-expert crowds to produce high-quality feedback. They focus on improving single feedback quality but omit the overall quality. In this work, we attempt to focus on the relationship among feedbacks and improve quality at the micro level (e.g., quality of individual) and macro level (e.g., diversity and coverage of all).

An individual often has a narrow viewpoint, but a group of people can bring together varying perspectives, knowledge, and experience. To leverage the power of group, structuring workers effectively is needed. Zhu et al. (Zhu et al. 2014) have examined how different organization strategies improve the peer reviewers' performance. The work shows that interactive reviewer teams outperform individual reviewers. Also, aggregating individuals into nominal groups generates better results than interactive teams, except for the task which is required to mitigate the misconception by discussion. Instead of exploring organization approaches, we are more interested in how to improve feedback generation by enhancing social interaction.

We obtain insights drawn from the pilot study comparing three settings: non-interactive, asynchronous interaction, and synchronous interaction. Presenting existing feedbacks motivates reviewers to make contributions from varying perspectives. To enhance diversity and coverage, we propose to adopt some familiar designs from social media such as discussion threads on Reddit and "+1" button on Google Plus. To facilitate communication, we use a spatially anchored conversation thread for exchanging reviewers' opinions. To avoid redundancy, we use a low-effort agreement mechanism for reviewers to express identical opinions with one click. Those designs can guide people to produce feedbacks of greater diversity and breadth of concepts as better support for the revision and improvement of documents.

Crowd Interactive Collaboration

Social interaction increases awareness and facilitates collaborations among the crowds. We discuss the pros and cons of three possible interaction strategies.

Non-Interactive Work

Allowing the worker to complete the task individually is the most common strategy for crowdsourcing work. It is simple and scalable. However, an individual might not have the complete set of skills required to accomplish a complex task. Redundancy of production, such as repeating comments or ideas, may also be a waste of time and resources.

Asynchronous Interaction

Asynchronous interaction including e-mail and discussion forums allows people to communicate at different times. In document review task, people can arrive asynchronously and collaborate with others on the same document. They can access the comments left by previous workers and leave the comments to interact with the future workers.

Synchronous Interaction

Synchronous Interaction such as chat allows people to interact with each other while performing the task. Various techniques of collaboration are possible for achieving the shared goals through social interaction in real-time.

- Divide and conquer
  The worker divides the task into small pieces and allocates work to team members. Each member can complete the smaller task individually. Divide and conquer may also better ensure coverage of different aspects of the problem space.
- Contribution after negotiation
  The worker makes contributions after reaching a group consensus. The quality of result can be ensured by a group decision. Synchronous interaction increases the workers' confidence in their decision.

However, synchronous interaction also has various drawbacks for inhibiting productivity, such as 1) production blocking during a group discussion; 2) the cost of coordination and conflict resolution; and 3) social loafing and possible biases caused by social influence.

Pilot Study

We ran a pilot study and recruited eight participants through the Internet. They were asked to review a document and provide feedbacks by "Suggested Edit" in Google Docs in 40 minutes. After the task, they were invited to attend a 15-minute open-ended interview.

In a non-interactive environment, workers gave feedbacks based on their own perspective. In an asynchronous interactive environment, workers tended to reply existing feedbacks from an opposite perspective, indirectly supporting the goal of diversity. They were likely to produce diverse feedbacks in this setting. In a synchronous interactive environment, workers dynamically adopted different strategies according to the context. For example, one group adopted divide-and-conquer strategy to reduce workload for completing the task effectively. They paid more attention on the smaller task and produced high-quality individual feedback. In contrast, another group spent most of the time on negotiation before giving feedbacks. Increasing social interaction leads to some coordination cost, but appears to boost workers' confidence to provide more concrete and complete feedbacks.

Crowd Reviewing Design

To encourage workers to generate feedbacks with better diversity and coverage, we propose a number of design features to support social interaction in reviewing task, including a spatially anchored feedback thread and a simple button for one-click agreement (see Figure 1).

Anchored Feedback Thread

Anchored Feedback Thread is a conversation thread pointed to a specific region of the document. Workers can interact with others asynchronously. Multiple topic discussions are not intertwined. In addition, workers can perceive the overall distribution of feedbacks in the document, which may be used to direct workers to pay more attention to regions receiving less feedbacks.

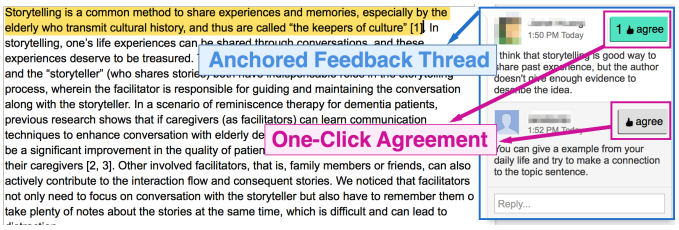

Figure 1: Two design features: anchored feedback thread and one-click agreement

One-Click Agreement

To avoid the redundancy, we design a low-effort agreement mechanism for reviewers to express identical opinions. People can agree with others with one click. It increases social awareness and encourage people to produce high-quality and diverse feedbacks.

Future Work

In this work, we investigate how social interaction facilitates collaboration and promotes greater diversity and coverage of feedbacks as better support for improvement of documents. For future work, we plan to conduct a large-scale experiment to evaluate our design.

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