Rsourcer: Scaling Feedback on Research Drafts

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Abstract

Feedback is an important component of the research process, but gaining access to quality and diverse feedback outside a research group is challenging. We present Rsourcer, a system to scale feedback on research drafts and ease the burdens of reviewing research drafts with a crowdsourcing process. Rsourcer streamlines the process of requesting, offering, assessing the quality and adopting the feedback.

Introduction

Feedback on research drafts is important for research processes, especially for early-stage researchers (ESRs), who are typically PhD students (Wang and Li 2011). However, most ESRs get limited feedback from a small circle of advisors, reviewers and peers (Zhang et al. 2017; Gafney 2005). Dedicated on-demand feedback from advisors is hardly scalable, since advisors have limited time and resources (Gafney 2005; Zhang et al. 2017). External feedback from beyond a research group is often desired and perceived to be useful for learning from diverse viewpoints (Jiang, Báez, and Benatallah 2021). Reviews from conferences and journals can be of good quality, but it normally takes quite long time to get the feedback (Nguyen et al. 2015).

Recently, some research initiatives and platforms have explored leveraging crowdsourcing techniques to scale on-demand research feedback, such as Agile Research Studios (Zhang et al. 2017) and PREreview.[1] These efforts are attractive because they provide access to external feedback, but voluntary contributing good-quality feedback on research papers takes time, effort and knowledge about how to offer good-quality feedback (Szeliski et al. 2020; Hinckley 2015; Nicholas and Gordon 2011). ESRs in particular are often concerned about the quality of the feedback and openly sharing their work-in-progress drafts online. They also often need support for understanding and adopting potentially conflicting feedback (Jiang, Báez, and Benatallah 2021).

In this WiP paper we present a system, namely Rsourcer, that is designed to address the main barriers to requesting, providing and adopting feedback on early research drafts.

[1] https://prereview.org/

Design Rationale

We derived the the most salient design goals for scaling feedback on research artefacts from our previous work on the barriers to effective support in online research communities (Jiang, Báez, and Benatallah 2021) and literature on crowdsourcing feedback on open-ended artefacts (Luther et al. 2015; Yuan et al. 2016; Bharadwaj et al. 2019; Ngoon et al. 2018; Yen, Kim, and Bailey 2020). Specifically, we designed *Rsourcer* to address the following goals: supporting researchers to collaboratively contribute feedback (G1), supporting reviewers to contribute good-quality feedback (G2), helping requesters (i.e., authors) to interpret and reflect on the feedback (G3), and providing a safe and incentivizing environment that encourages participation (G4).

Rsourcer addresses the above four goals in the following ways. For G1, rather than each reviewer spending time and effort to complete a comprehensive review for a draft, Rsourcer decomposes the feedback process into *micro-reviews*, which is a form of microtasks that researchers engage in to collaboratively generate feedback. For G2, instead of eliciting open-ended feedback, Rsourcer structures the micro-reviews with key components of a research review to guide reviewers to offer useful feedback (Luther et al. 2015; Yuan et al. 2016). Reviewers can rate other's feedback with specific criteria to help authors identify good-quality feedback. Reviewers can also self-reflect based on the ratings and improve their future micro-reviews (Bharadwaj et al. 2019; Ngoon et al. 2018). For G3, Rsourcer summarizes micro-reviews and corresponding ratings to help the authors sift through potentially large number of diverse feedback and prioritize issues to consider (Luther et al. 2015; Yen, Kim, and Bailey 2020). Rsourcer also links authors with volunteer mentors so that they can discuss the feedback. For G4, instead of requesting openly for online feedback, Rsourcer allows researchers to request anonymously as well as requesting feedback from researchers they trust.

These design elements come together in a pipeline that streamlines the process of requesting, offering, and adopting feedback. Rsourcer is currently offered through Slack,[2] a team communication platform that is emerging as a tool to support education (Chen and Chen 2020) and scale participation in scientific communities (Fulcher et al. 2020).

[2] https://slack.com/intl/en-au/features

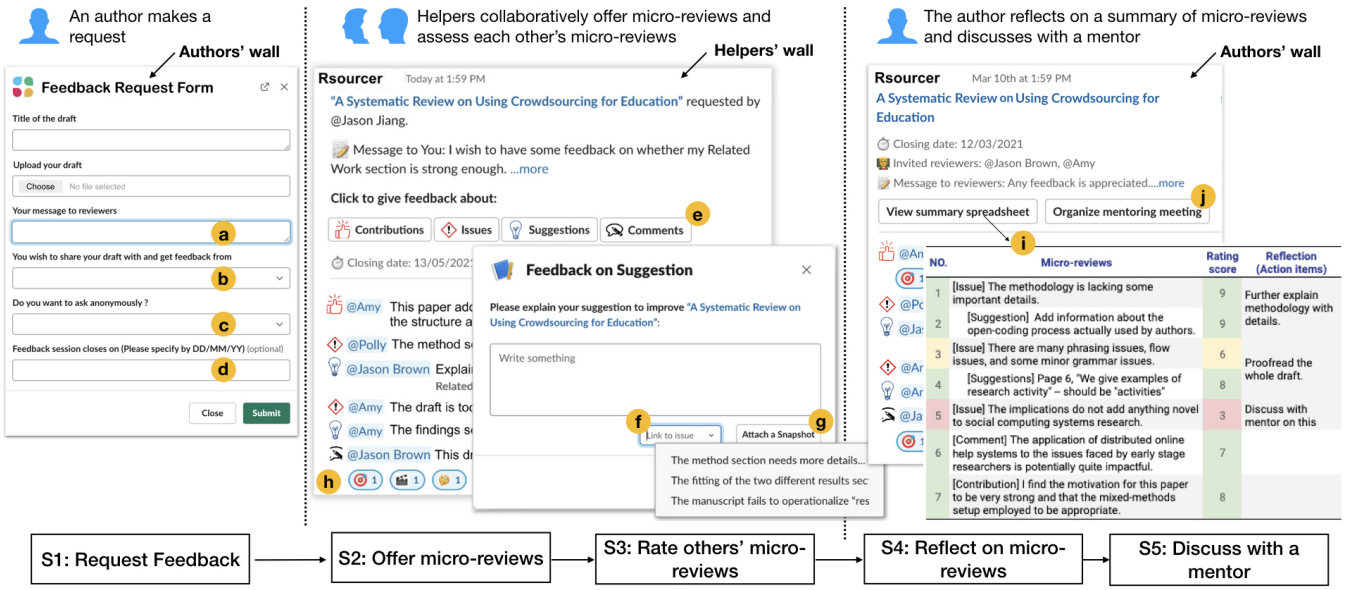

Figure 1: Rsourcer pipeline and example interface screenshots, showing the core features of Rsourcer.

Rsourcer

The pipeline of Rsourcer consists of five stages (Fig. 1). An author – *requester*, who needs feedback on a draft, fills out a feedback request form (S1). Then, Rsourcer distributes the request to the *reviewers* selected by the requester. Reviewers who accept the request provide (S2) and assess (S3) micro-reviews using a scaffolded interface. The requester can reflect on a summary of the micro-reviews (S4) and organize a meeting with a volunteer mentor to discuss it further (S5). Next, we discuss each step in the pipeline.

S1: Request Feedback A requester can personalize their requests in the following four ways, which can be achieved by filling out a feedback request form (Fig.1). First, requesters can specify their needs for feedback by including a message for reviewers, so that reviewers can better understand requester's needs to focus on specific aspects of the draft (Fig.1a). For example, requesters can specify that they need feedback on the related work section only. Second, requesters can invite specific individuals and groups of (trusted) reviewers for feedback (Fig.1b). Third, requesters can indicate whether to request anonymously (Fig.1c) as some ESRs feel unease in requesting with a public profile (Jiang, Báez, and Benatallah 2021). Fourth, requesters can include a feedback session closing date (Fig.1d), so that requesters are more likely to get feedback in time.

S2: Offer Micro-reviews We derived four types of micro-reviews based on reviewing guidelines and discussions on what constitute good reviews in traditional peer review context (Hinckley 2015; Rick Szeliski 2021). A micro-review can be a contribution, issue, suggestion, or comment (Fig.1e). Contributions describe the strengths and utility of the work. Issues describe problems and limitations of the work. Suggestions describe concrete changes in order improve the reviewed work (e.g., address specific issues). Comments describe any other review aspect that the reviewer deems relevant. Examples of micro-reviews are shown in Fig.1i. A reviewer can offer multiple micro-reviews and link them to issues raised by other reviewers or herself (Fig.1f). A reviewer can attach snapshots (e.g., a paragraph, a figure) to a micro-review (Fig.1g) to refer to the parts in the draft the micro-review is about.

S3: Rate Other's Micro-reviews Reviewers can rate other' micro-reviews as actionable, justified and/or specific (Fig.1h). We adopted these criteria from the attributes of good feedback on creative designs (Ngoon et al. 2018; Yuan et al. 2016) and the theory of formative assessment (Sadler 1989). A micro-review is actionable if it provides guidance on how to improve the draft; justified if it contains an explanation or reason for a micro-review; and specific if it is related directly to a particular part of the work rather than vaguely referent. Ratings are made available to the requester.

S4: Reflect on a Summary of Feedback For each draft, the requester can get a summary of micro-reviews and the corresponding ratings. The summary is in the form of a spreadsheet (Fig.1i). Ratings on micro-reviews (R_i) are presented in different colors according to quality score (Q_i), where $Q_i = sum(R_i)/sum(R_{1-N}) * 10$. The micro-reviews are colored in green if $Q_i \geq 7$, indicating that the micro-review is rated as high quality; yellow if $4<Q_i<6$, indicating that the micro-review is rated as moderate quality; red if $Q_i \leq 4$, indicating that the micro-review is rated as of insufficient quality. Both requester and mentors can add comments, notes and action items to the spreadsheet in the column of 'Reflection (Action Items)'.

S5: Discuss with a Mentor The requester can organize an 1-1 mentoring meeting with a volunteer expert (Fig.1j), so that they can go over the feedback, discuss action items to prioritize and address reviews and get additional feedback.

Evaluation. Through video prototypes, we are currently running an online evaluation with ESRs to get formative feedback on the pipeline and design elements.

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