AnnoDiver: Applying Visual Analytics on Social Annotations to Facilitate Balanced Research Paper Discourse

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Introduction

Prior work has revealed two issues in the use of social annotation as a learning tool for research paper discussion:

1. It can be difficult to navigate a large volume of social annotations on a research paper.
2. Establishing discussions with balanced contributions and diverse viewpoints remains a challenge.

To address these issues, we designed a prototype social annotation tool that displays interactive visualizations of annotation threads, and tested the following hypotheses in a user study:

H1. The interactive visualizations of the comments will lead learners to explore more annotation threads.
H2. Displaying the total counts of comments per contribution category will motivate learners to leave comments in less-populated categories.

System Design & Features

Keywords:
- social annotation, eased learning, human-centered design, social sciences, research paper, collaboration

Key Term Frequency List

- A quickly digestible synthesis of peer commentary
- Navigable feature allows the user to explore and locate comments of interest

Sentiment Axis

- Displays the distribution of the sentiments conveyed in the paper annotation comments (user’s own are in blue)
- Allows the user to navigate annotations by sentiment

Comment Category Chart

- Interactive bar chart that displays the comment counts in each of the four contribution categories
- The user’s own contributions are distinguished in solid color to help the user to keep track and compare

Evaluation

We conducted a user study with 8 participants, who were separated into a control group (no visualization features) and an experimental group.

During 45-minute Zoom sessions, each participant was asked to complete two tasks as they read a short paper that we seeded with 25 comments:

1. Create at least three comments
2. Find three different viewpoints presented by the paper or discussed in the social annotations

For H1, our quantitative results indicated some promise in that the experimental group tended to explore more annotations threads.*

We found no support for H2, although the visualizations seemed to have led to an increase in the creation of comments*. *not statistically significant

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