Brief Summary

The paper "Signals Matter: Understanding Popularity and Impact of Users on Stack Overflow" performs a detailed study on how digital awards and points collected by a user on StackOverflow could be an indicator of their impact on the website.

The authors begin by performing a survey of StackOverflow users. The responses were compiled and used to form two hypotheses. To check them, the authors performed various statistical tests on the archived SO data from the site's inception.

The paper concludes that the empirical analysis of the data "mostly" supports the hypothesis. Although digital markers like badges, in general, are a somewhat decent indicator of a user's impact on the website, it is the rarer ones that are most reliable.

Methodology

The survey posed multiple questions about how various markers like reputation score and badges are perceived and how good are they at conveying a user's expertise. Information from the survey is used to define two hypotheses that are later tested.

1. Reputation Score and Badges are positively correlated with a user's popularity and impact.
2. Reputation Scores are better indicators than Badges.

To test these hypotheses, the authors define two metrics, Popularity Score (the views), Impact Score (a measure of benefit to the community a user has provided).

The core idea behind the paper is to use the data to fit a model (Gradient Tree Boosting Regression in this case), and see how good it fits the provided data points based on the provided features. A better fit means that those features are more important.

The analysis of the results from these experiments reveals that a user's reputation on the site and the badges they have earned are positively correlated. However, it is essential to note that not all badges have equal importance; a necromancer badge is much better than a documentation badge.

This information is further used to classify the users into four categories based on low and high popularity and impact. These categories have substantial differences in the post and answer scores. This shows that badges are a reasonably good indicator of user popularity and influence on the website.

Contributions

The authors have been fairly mindful of understanding that it is difficult to be concretely sure of any results presented in the paper due to the massive amount of information associated. However, the results are still very useful to try different approaches when designing systems with gaming elements to improve participation.

Some possible future work

This paper tries to establish if there is a positive correlation between badges and user impact. One possible avenue of exploration could be the correlation between the tags on a question and the user type that answers that question.
It is fairly commonly documented that tagging a question results in better and faster answers but exploring the relation between the tags on the question and the answerer could be fun.
Do tags like "HPC" invite users with commonly available badges or the rarer ones. Questions like these could be interesting to answer.