Behavioral Analysis of Review Fraud: Linking Malicious Crowdsourcing to Amazon and Beyond
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Motivation

- We exploit the prevalence of malicious review writers on crowdsourcing platforms to identify actual fraud reviews on Amazon.
- We investigate the strategies of a collection of actual fake review writers by monitoring low moderation crowdsourcing sites like RapidWorkers, ShortTask, and Microworkers.
- We can gain access to a pool of crowd workers who we know for certain have engaged in fake reviews writing.
- We provide the first long-term study of actual fraudulent behaviors in online review manipulation.

Overall Approach

Observations

<table>
<thead>
<tr>
<th>Ratings distribution</th>
<th>Fraudulent reviewers tend to give more 4 and 5-star reviews.</th>
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<tbody>
<tr>
<td>Verified purchases</td>
<td>Most reviews by fraudulent reviewers are for products that do not have an associated “verified” purchase.</td>
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<tr>
<td>Conveying Personal Experiences</td>
<td>We find that 66% of reviews by fraudulent reviewers contain first-person pronouns, compared with only 42% of reviews by legitimate reviewers.</td>
</tr>
</tbody>
</table>

Motivation

- Burstiness of reviews: the x-axis measures the times-tamp standard deviation per reviewer. The distribution for fraudulent reviewers is left-skewed indicating that their reviews tend to be posted in bursts.
- Self-similarity distribution: We measure the lexical overlap between each review and the previous 10 reviews written by the same reviewer using Jaccard similarity measure. Fraudulent reviewers mimic themselves.
- Language evolution: We measure the deviation of language used by each group from community language using cross-entropy. It shows fraudulent reviewers begin to reuse common linguistic patterns.

Summary

- Our behavioral analysis of these actual fake review writers has also uncovered clues that may aid in their detection.
- In our ongoing work, we are expanding our coverage both in terms of crowdsourcing sites and targets of manipulation (e.g., App Store, Play Store, Yelp).
- We are eager to further explore how linguistic evolution may provide new insights into the strategies of review manipulation.
- We will also investigate the network behavior of the fraudulent reviewers.