Ensuring Credibility of Online User Reviews

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Introduction

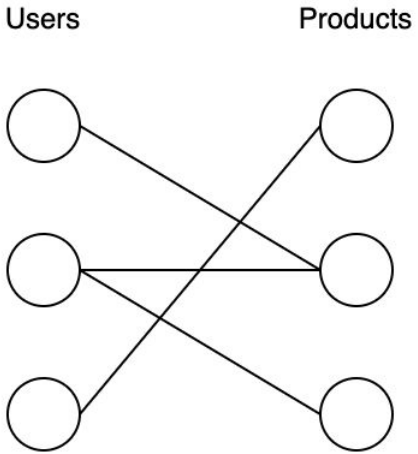
- Online forums are getting increasingly affected by deceptive user reviews
- Current methods
  - Place more emphasis on detecting non-credible reviews than on detecting non-credible users
  - Classify a review as either credible or deceptive
  - Give more credibility to long-term users

Proposed Approach

- Implemented algorithms laid out in NETINF[1] and EigenTrust[2] papers
- Two major steps:
  - Estimate structure of user-user network based on review timestamp and usefulness score of review given in the dataset
  - Assign global trust value to each node (aka user) in the network

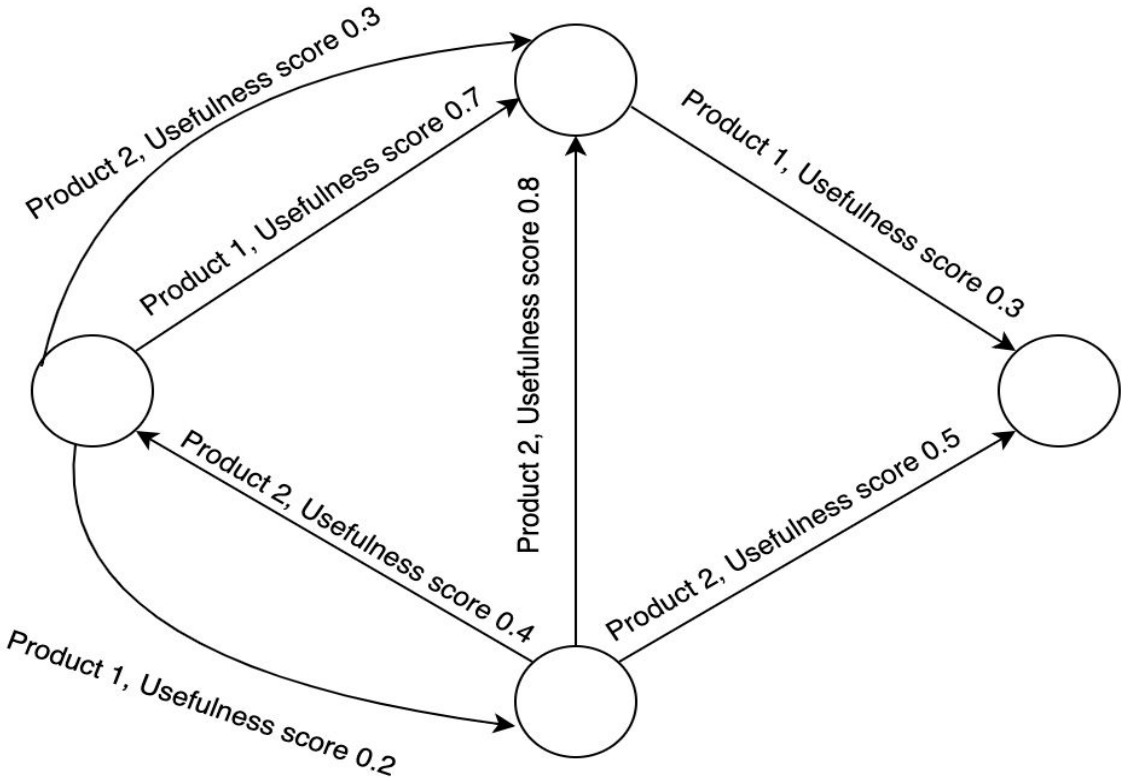
Dataset Used

- Amazon Musical Instruments reviews SNAP dataset
- 2.5 MB of data (~10,000 reviews)
- Includes reviewer ID, product ID, usefulness score of review, Unix timestamp of review

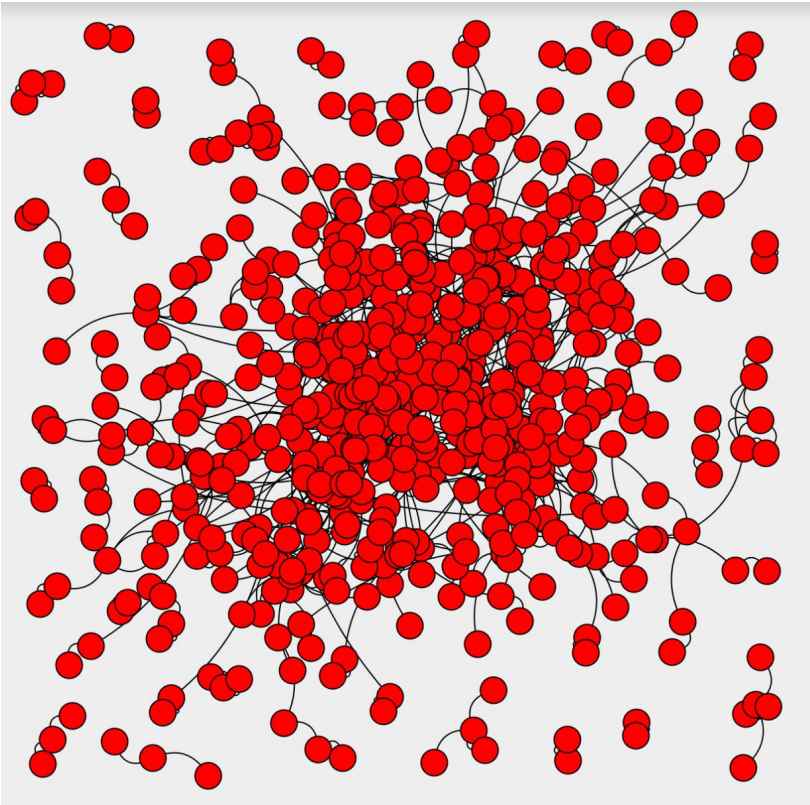


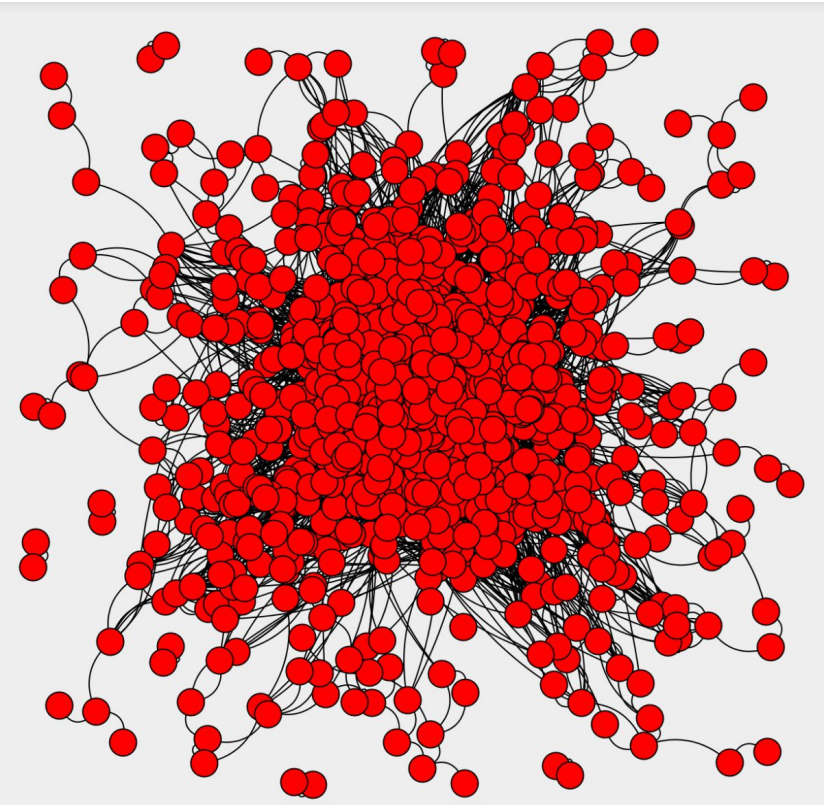

```
{
  "reviewerID": "A2SUAM1J3GNN3B",
  "asin": "0000013714",
  "reviewerName": "J. McDonald",
  "helpful": [2, 3],
  "reviewText": "I bought this for my husband who plays the piano.
He is having a wonderful time playing these old hymns.  The music  is
at times hard to read because we think the book was published for
singing from more than playing from.  Great purchase though!",
  "overall": 5.0,
  "summary": "Heavenly Highway Hymns",
  "unixReviewTime": 1252800000,
  "reviewTime": "09 13, 2009"
}
```

NETINF + EigenTrust



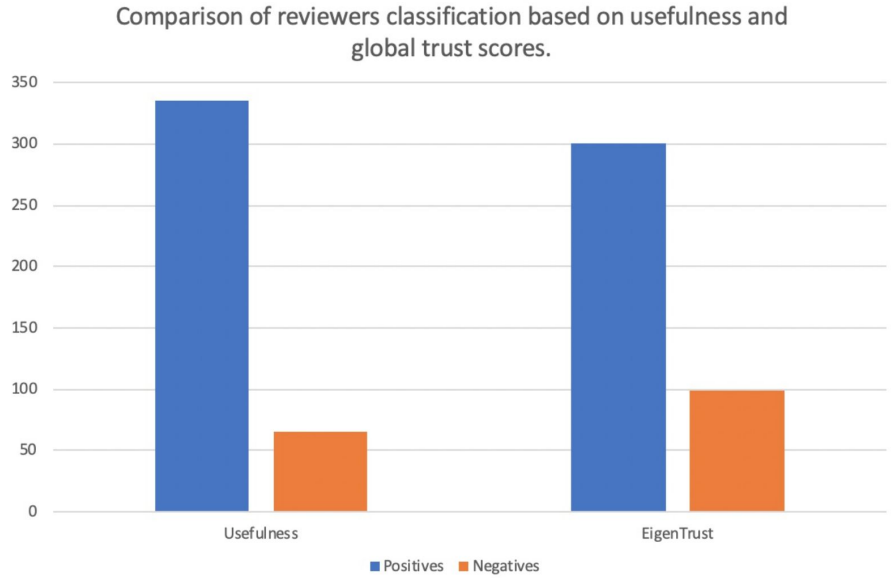
Results





Evaluation

- With usefulness scores:
  - 335 credible reviews
  - 65 non-credible reviews
- With global trust based calculations:
  - 301 credible reviews
  - 99 non-credible reviews



Conclusion & Future Work

- Implementation of NetInf and EigenTrust algorithms allowed us to obtain user-user relations and global trust scores
- Future work:
  - Generalize approach to fit other trust-based models
  - Determine other parameters which can be used to build a more well-rounded user-user network

Bibliography

[1] M. Gomez-Rodriguez, J. Leskovec, and A. Krause. Inferring Networks of Diffusion and Influence. *ACM Trans. Knowl. Discov. Data*, 2012.

[2] S. Kamvar, M. Schlosser, and H. Garcia-Molina. The Eigentrust Algorithm for Reputation Management in P2P Networks. *Proceedings of the 12th International Conference on World Wide Web*, 2003.