

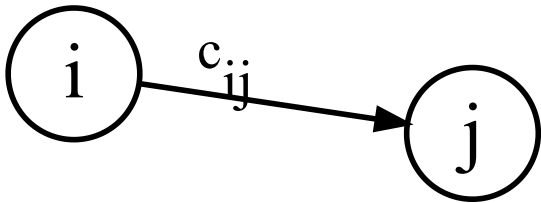
From EigenTrust to SHAPE-Trust

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Motivation

- Trust in P2P networks
 - Malicious attacks



Assignment

1. Implementation of the algorithms in Julia
2. Experiments for comparison of the algorithms
3. SHAPE-Trust characteristics

EigenTrust

- aggregation of opinions
- stationary distribution / eigenvector ($\lambda = 1$)

$$t_{ik} = \sum_j c_{ij} c_{jk}$$

$$\vec{t} = (C^T)^2 \vec{c}_i \dots \vec{t} = (C^T)^n \vec{c}_i$$

MaxTrust

- Max-Plus algebra

$$(+, \cdot) \rightarrow (\oplus, \otimes) = (\max, +)$$

- Eigenmode

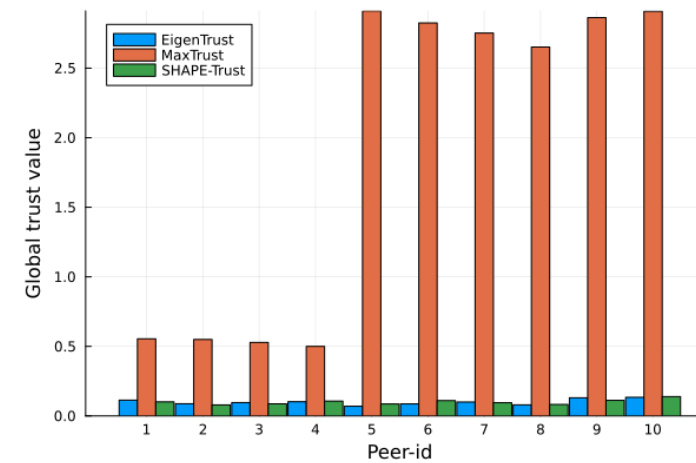
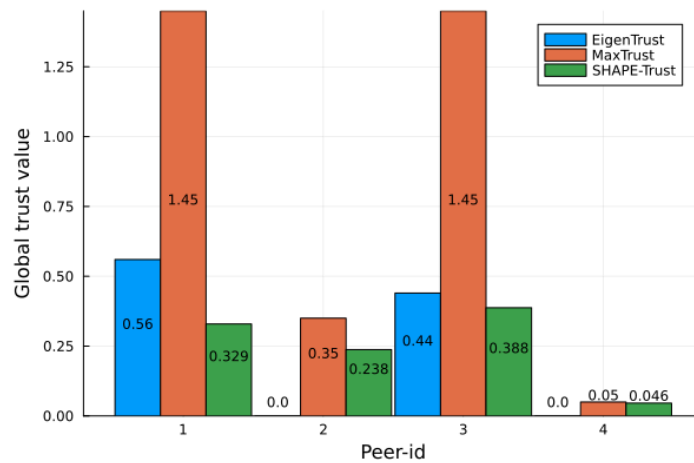
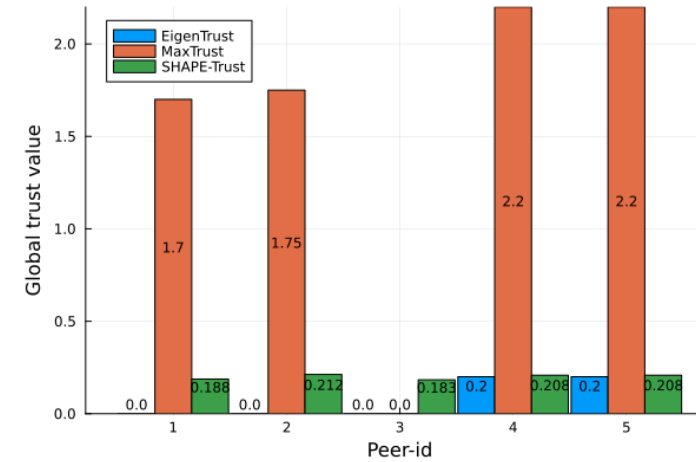
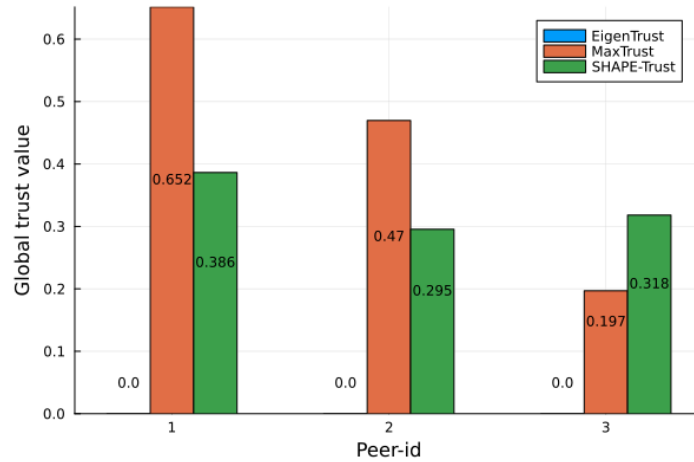
$$A \otimes (\eta^{\otimes k} \otimes v) = \eta \otimes (\eta^{\otimes k} \otimes v)$$

SHAPE-Trust

- Coalitional game theory
- Shapley value

$$v_{\mathcal{G}}(S) = \sum_{\substack{i,j \in S \\ (i,j) \in E}} c_{ij} + \sum_{j \in S^*} \min_{\substack{i \notin S \\ (i,j) \in E}} c_{ij}, \quad S \subseteq N$$

Experiments



Conclusion

This thesis:

- Implemented all algorithms in Julia
- Compared all algorithms on specific instances

Future research:

- Experiments with real data

Thank You For Your Attention

Reviewer's Question 1

Figure 1.5: Algorithm 2: There is a parameter “ a ” in the algorithm, which represents the convex combination of two vectors. What value is chosen for “ a ” in the thesis?

Reviewer's Question 2

Do you have any idea about the difference between time complexity of both methods?

Reviewer's Question 3

Table 4.2: According to the graph in Figure 4.5, peer-2 and peer-4 are assigned the same value 0.0, although the author presents the ordering as 3. And 4., respectively. Such an ordering supports the claim that “all algorithms rated the peers appropriately”. My question is why did the author choose this ordering, despite the values being the same?

