

Trust-Decisions on the Base of Maximal Information of Recommended Direct-Trust

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How far can recommended trust be the base of a trust decision if one expects that part of the information is given by malicious participants?

Trust-information given by a recommender may be reliable or not.

X builds a network of relations, using recommended and direct information (fig 1).

If X performs a trust-decision towards Y, the network of relations is transformed into a decision tree (fig 2).

X chooses a path by random to reduce the influence of malicious nodes. Passing a node, X chooses by random if it trusts the recommended information or not. With higher chance paths are chosen, where it is more certain not to end in an un-trusted node.

The build of a decision-tree has exponential complexity.

Two trials to reduce its complexity:

- Restricting hops to destination.
- Limiting the minimal certainty of a sub-tree.

Simulations show, that limiting the tree to 7-8 hops (fig 3) or 0.2-0.3 minimal certainty (fig 4) gives acceptable results compared to the unrestricted values.

Simulations with malicious participant giving more positive or more negative trust-values show that the influence lies in the percentage-magnitude like the percentage of malicious participants (fig 5).

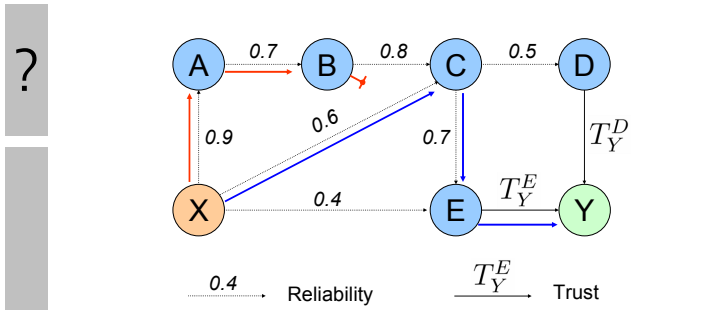


Figure 1. Network of Relations

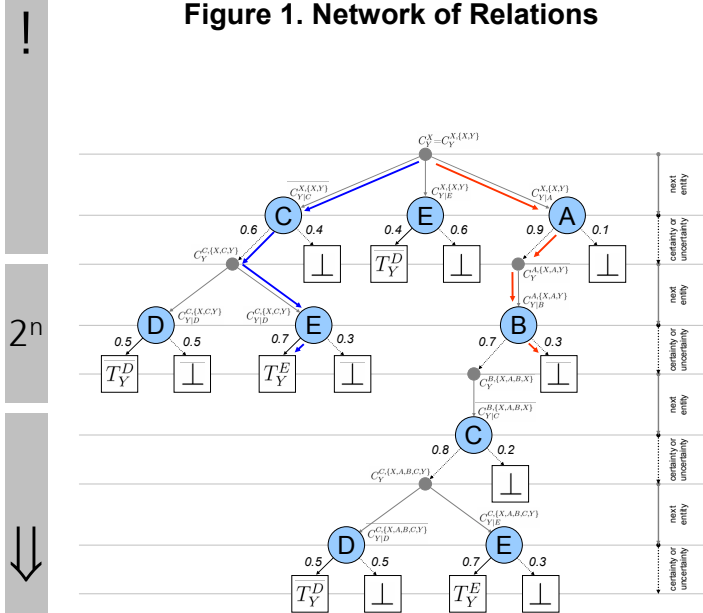


Figure 2. Decision-Tree

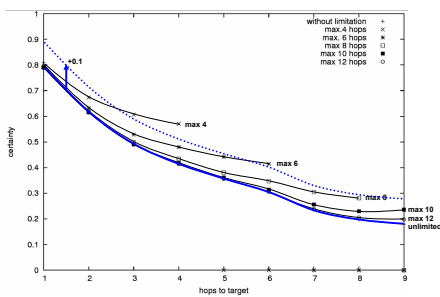


Figure 3. Simulation with Hop-Restriction

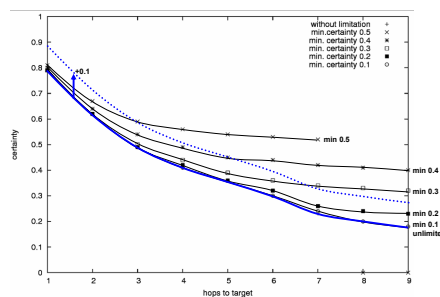


Figure 4. Simulation with Certainty-Restriction

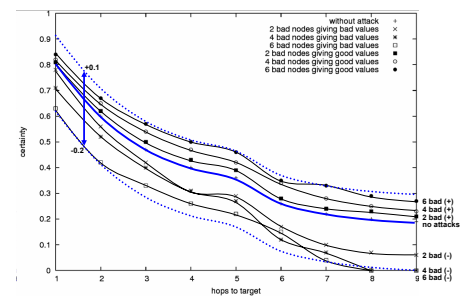


Figure 5. Influence of Malicious Participants