

## Trust Framework for Social Networks

Arjan Durresti

Computer Science, Indiana University Purdue University Indianapolis

[www.cs.iupui.edu/~durresti](http://www.cs.iupui.edu/~durresti), [durresti@cs.iupui.edu](mailto:durresti@cs.iupui.edu)

### Project Description/Objectives

- Consider trust assessments as measurements
- Combine psychology with measurement theory
- Design new trust metrics: impression and its corresponding confidence
- Develop trust combination based on the theory of measurement errors.

Transitive Trust - Chain of series links - Transitive error

Links in parallel – Aggregated Trust – Aggregate errors

- Develop security and decision making mechanisms for social networks
  - Filter untrusted information and DDoS
  - Enlarge the trusted coverage
  - Identify and filter out cliques of attackers

## Findings and Future Work

- Experiments with dataset from Epinions.com, 405,154 users commenting about items and about each other
- Verified the reliability of our trust framework
  - Compared direct trust with indirect trust, very good Coincidence for high level confidence
  - While direct trust - very small part of potential connection
  - Using indirect trust – increased more than 2000 times the trust coverage
- Very powerful tool in social networks
- Tradeoff between level of confidence and coverage
  - Example: Used to increase the high potential targets for advertisement
    - Tradeoff between resources and potential results
- Similarly tradeoff between the number of recommenders and the confidence on them
- Filter against DDoS and untrusted information
- Damage level depends on the trust level of attacker
- But not on the number of attackers
  - 1) Because our trust framework behaves like a filter against low trusted information
  - 2) Crowd effect , more paths considered – more chances to discredit malicious information
- Use our trust framework to discover and Filter out cliques of attackers
- A clique: group of nodes that increase quickly the trust of each other
- Use graph theoretical tools, graphlets to detect dynamically the formation of cliques of trust

