Sharing Uncertain Graphs Using Syntactic Private Graph Model

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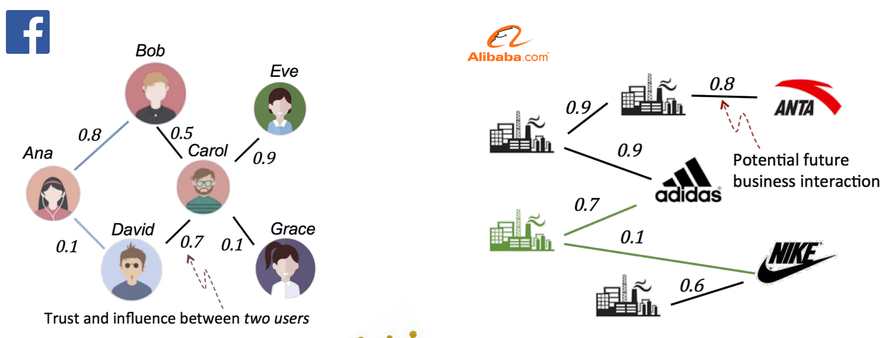
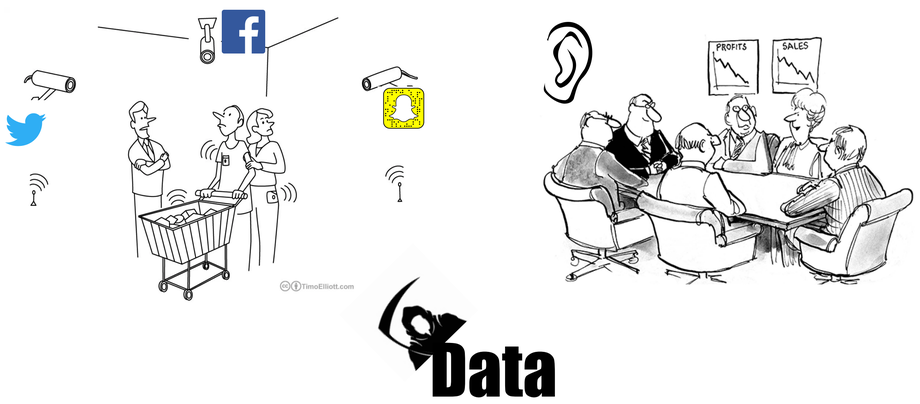
Objective: Sharing Uncertain Graphs



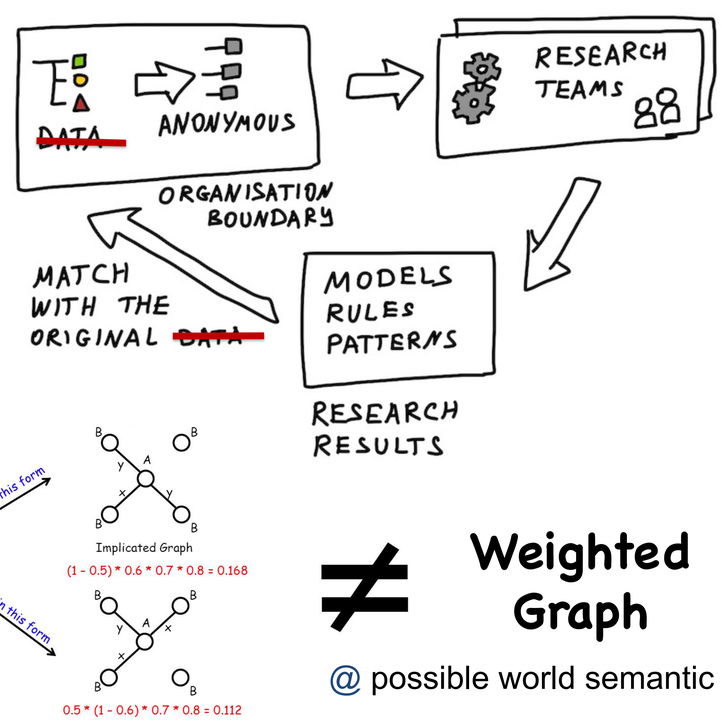
Data

Concern: Privacy Breach



Data

Option: Anonymization



Uncertain Graph

≠ **Weighted Graph**

@ possible world semantic

The simplest case: edge independent

Current graph anonymization techniques only target deterministic graphs and overlook the uncertain scenario.

Challenges

- ***Stochastic Privacy Attack***

Leak caused by edge uncertainty

- ***Stochastic Utility Loss***

ruler

Structural difference over uncertain graphs

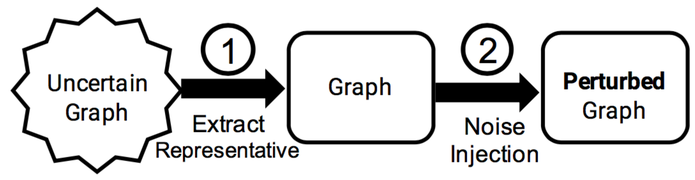
- ***Intractable Search Space***

Exponential search space

Chameleon: Uncertain Graph Anonymization Solution

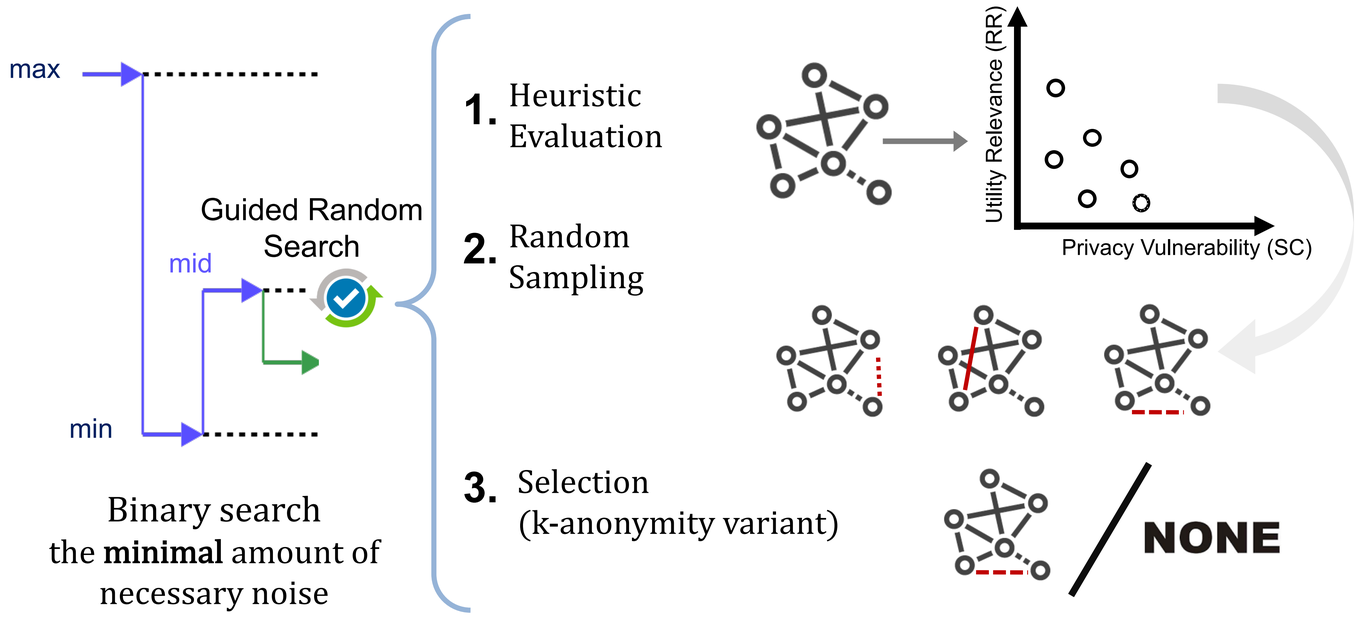
<u>Baseline Approach: Rep-An</u>

✓ Combines isolated techniques
✓ Suffers from huge utility loss



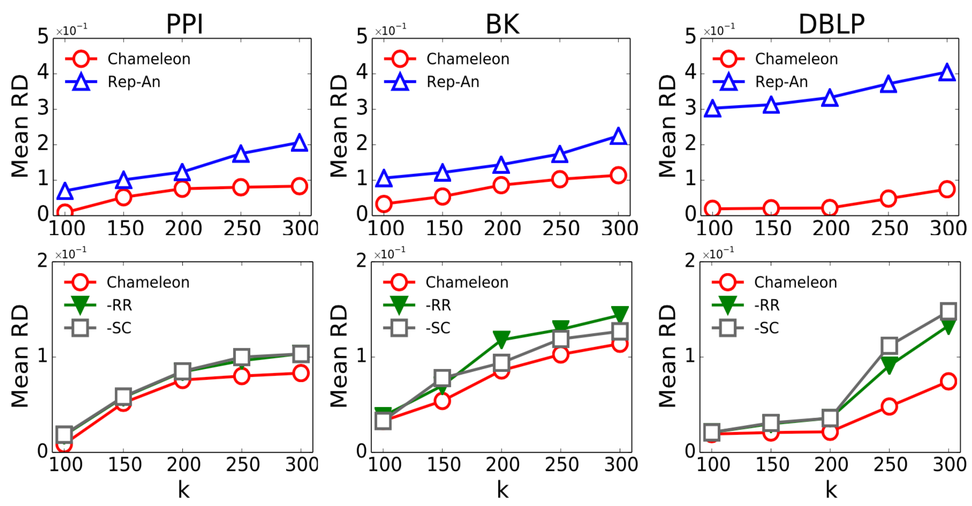
chameleon

✓ With the possible world semantics
✓ Enables a fine- grained control of injected noise



Binary search the **minimal** amount of necessary noise

Empirical Evaluation



Rep-An: Baseline Approach
SC: *Stochastic Controlled* Heuristic
RR: Reliability Relevance Heuristic

The generated anonymized uncertain graphs that closely match the original ones w. r. t Reliability .