

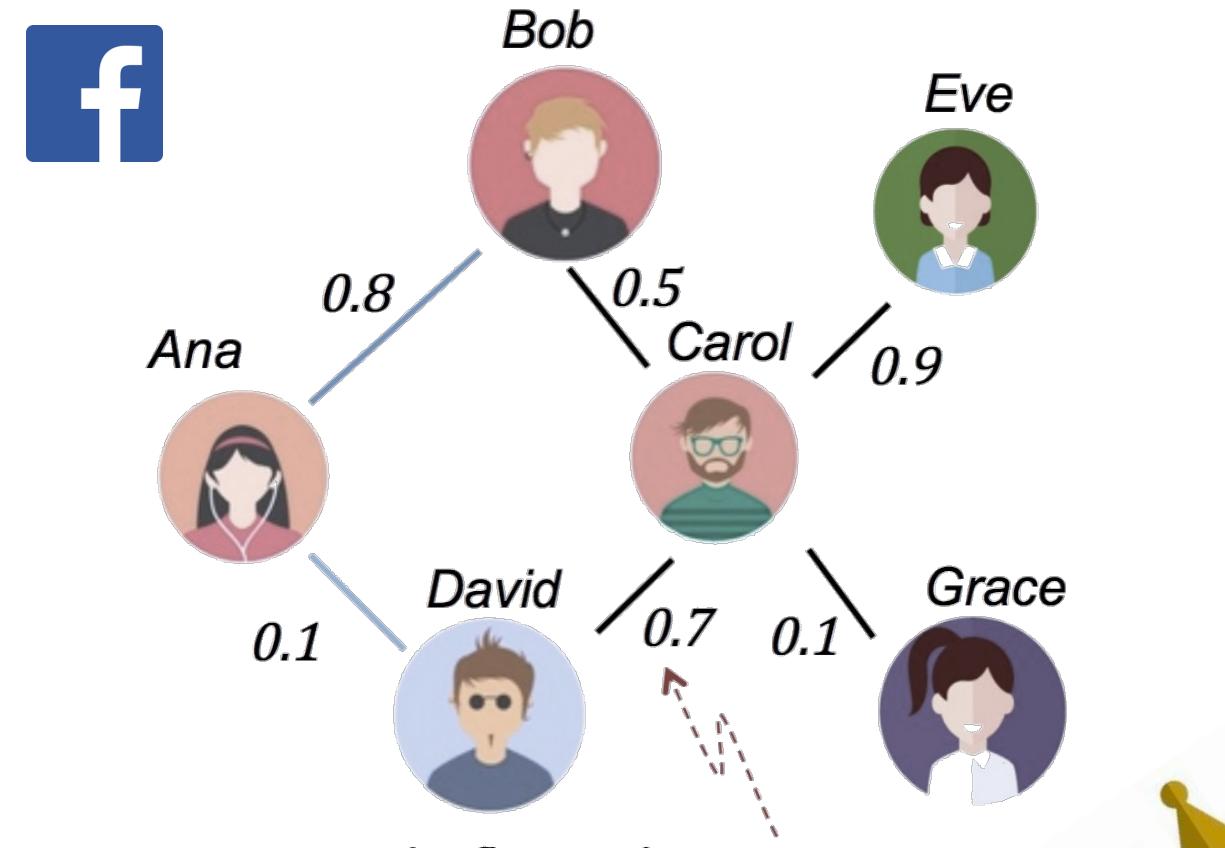
**WPI**

# Sharing Uncertain Graphs Using Syntactic Private Graph Model

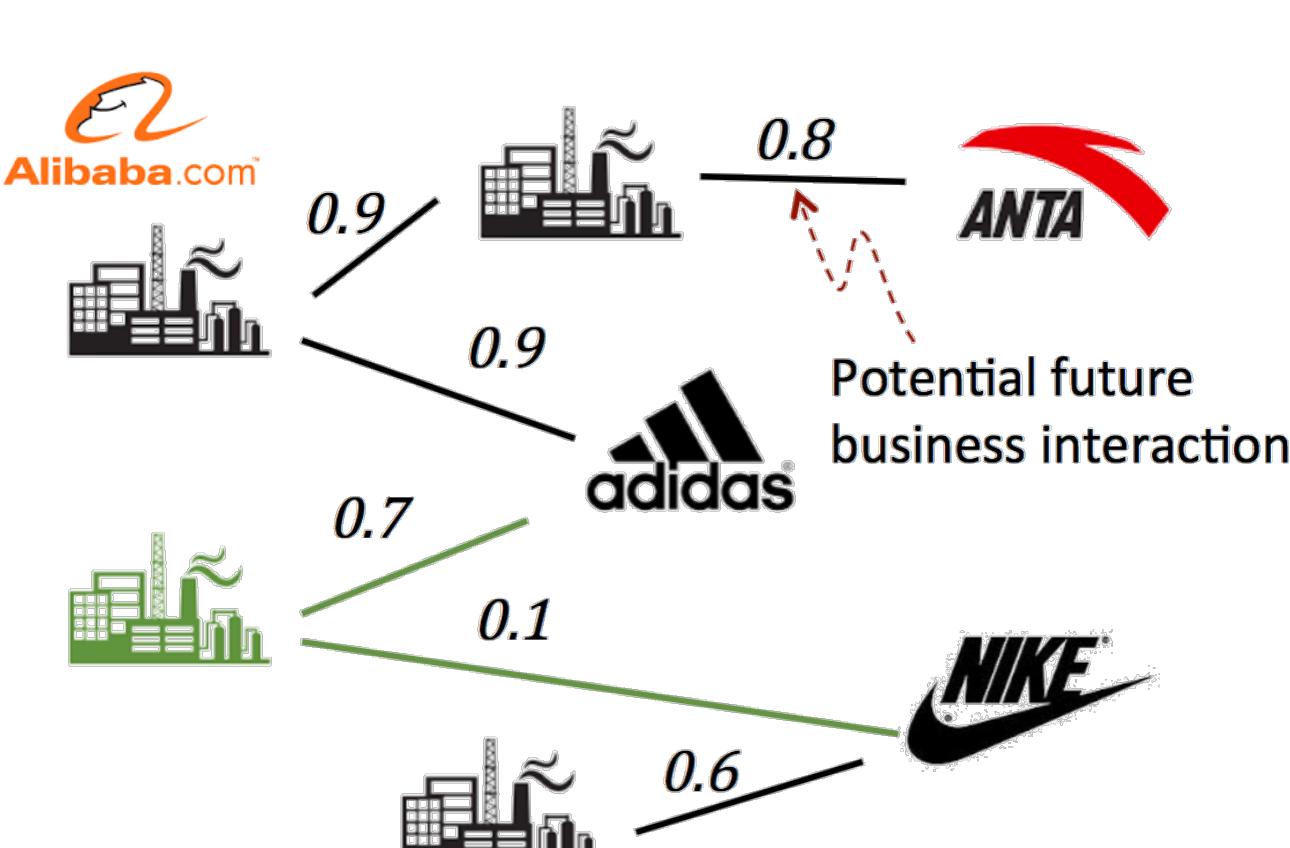
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## Objective: Sharing Uncertain Graphs

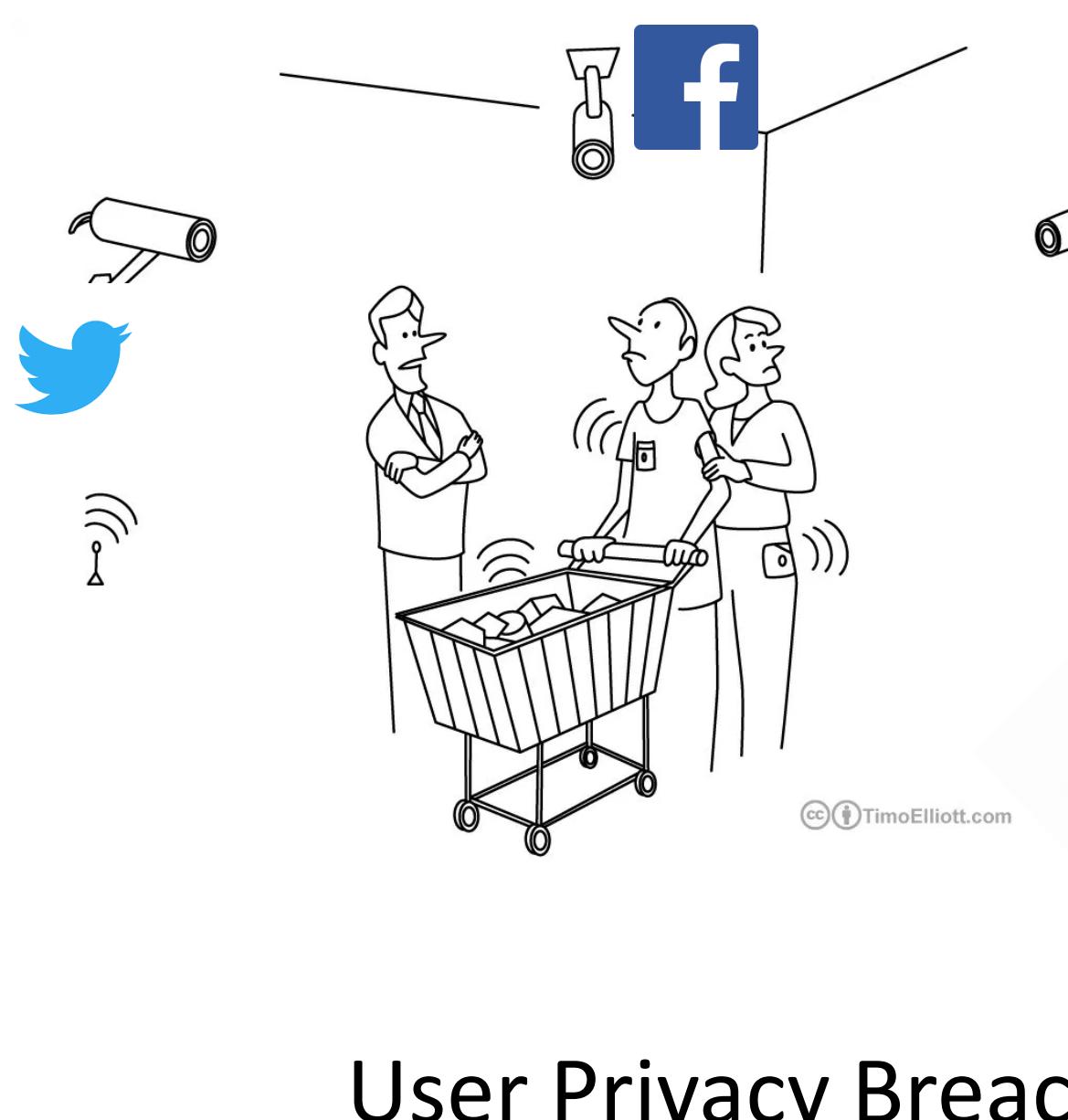


Social Interaction Study  
Micro-targeting



Theory Validation  
Virtual Marketing

## Concern: Privacy Breach



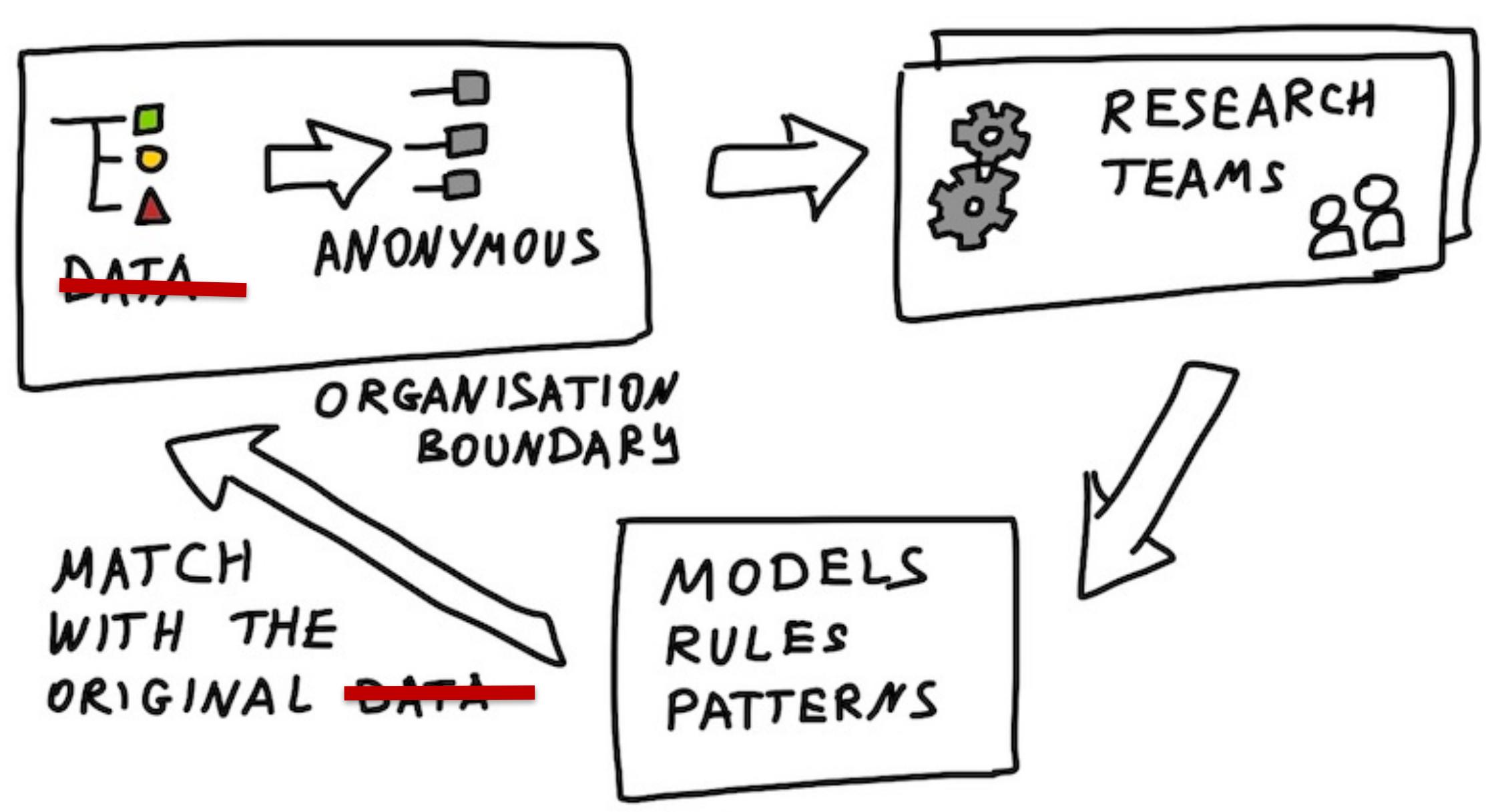
User Privacy Breach



Business Model Leak

## 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

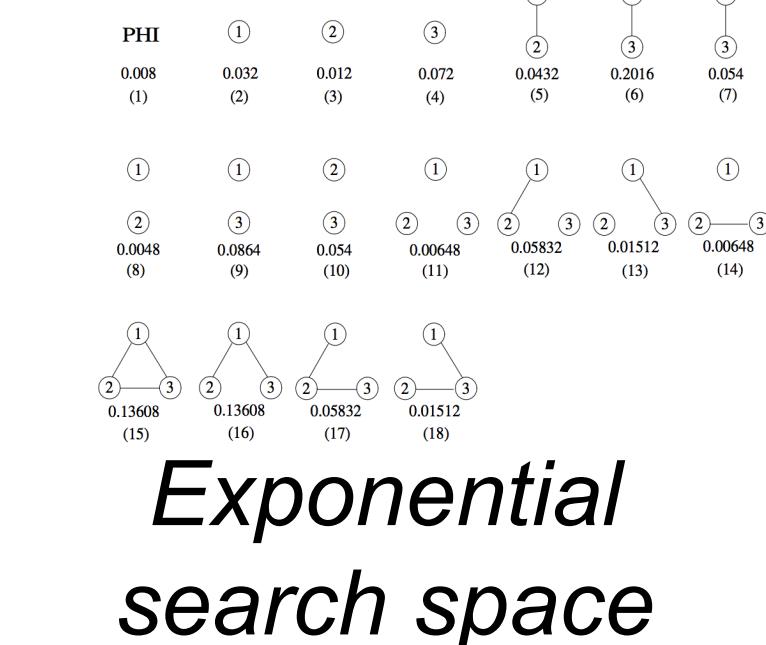
- **Stochastic Privacy Attack**
- **Stochastic Utility Loss**
- **Intractable Search Space**



Leak caused by edge uncertainty



Structural difference over uncertain graphs

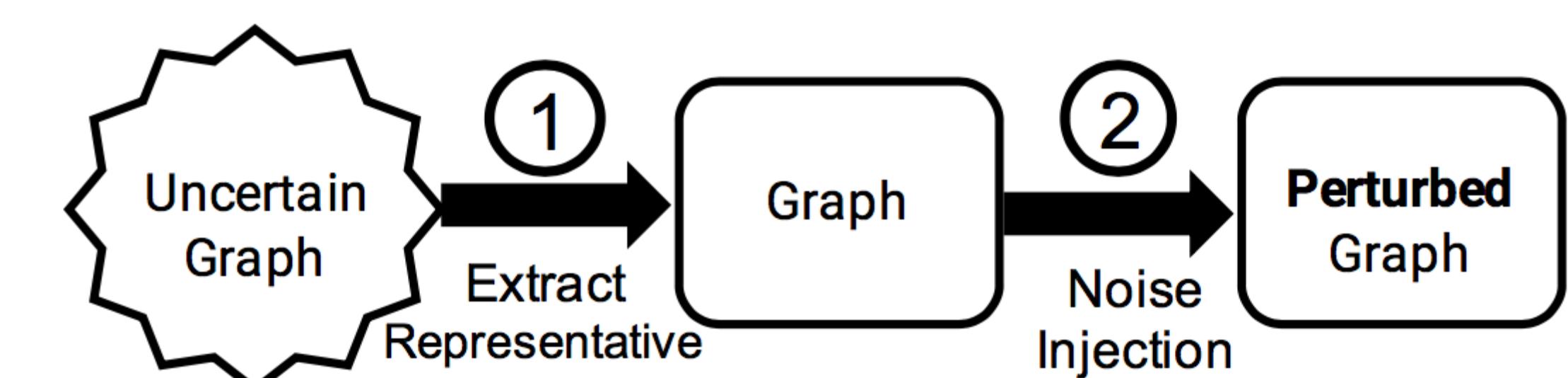


Exponential search space

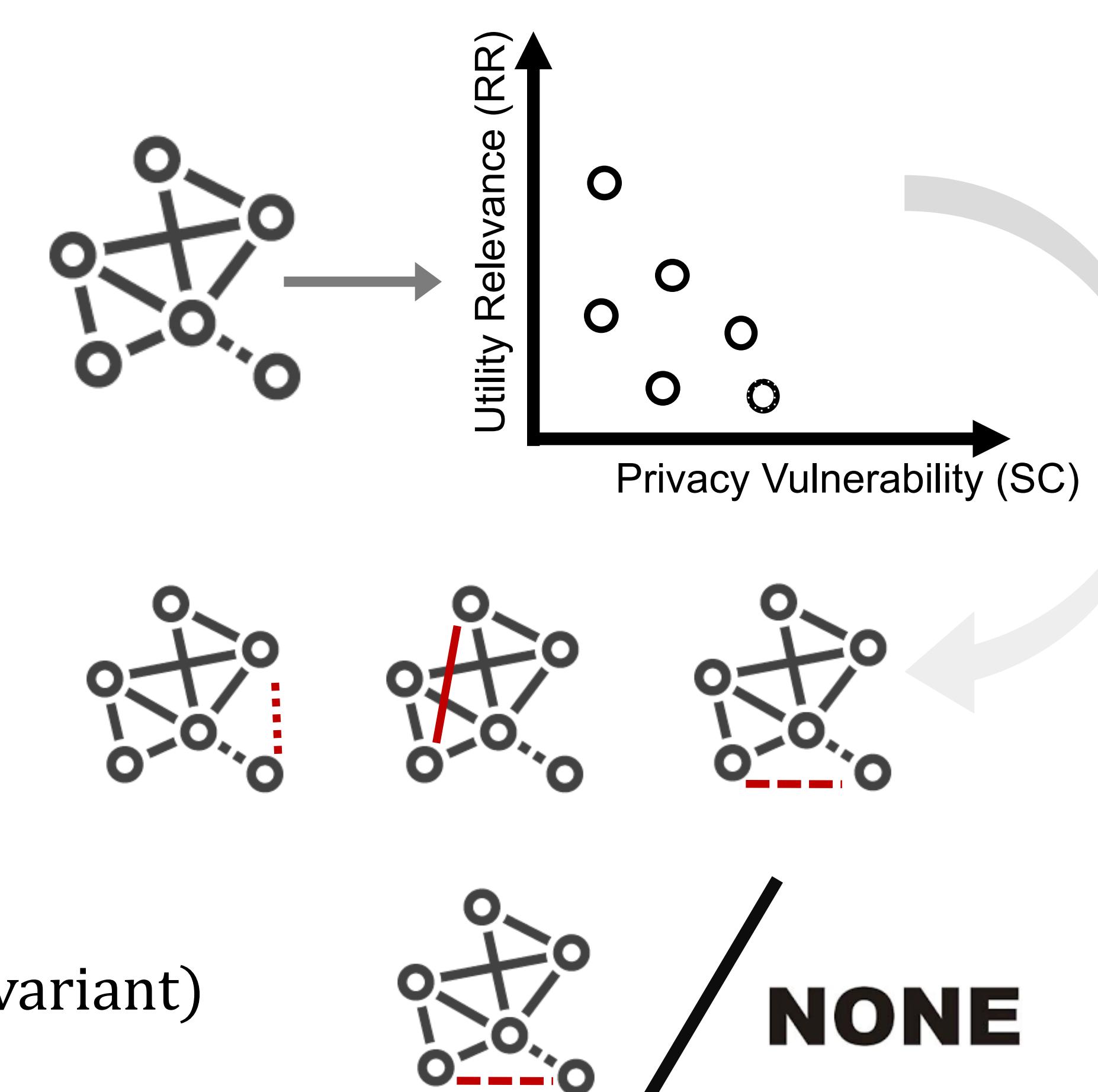
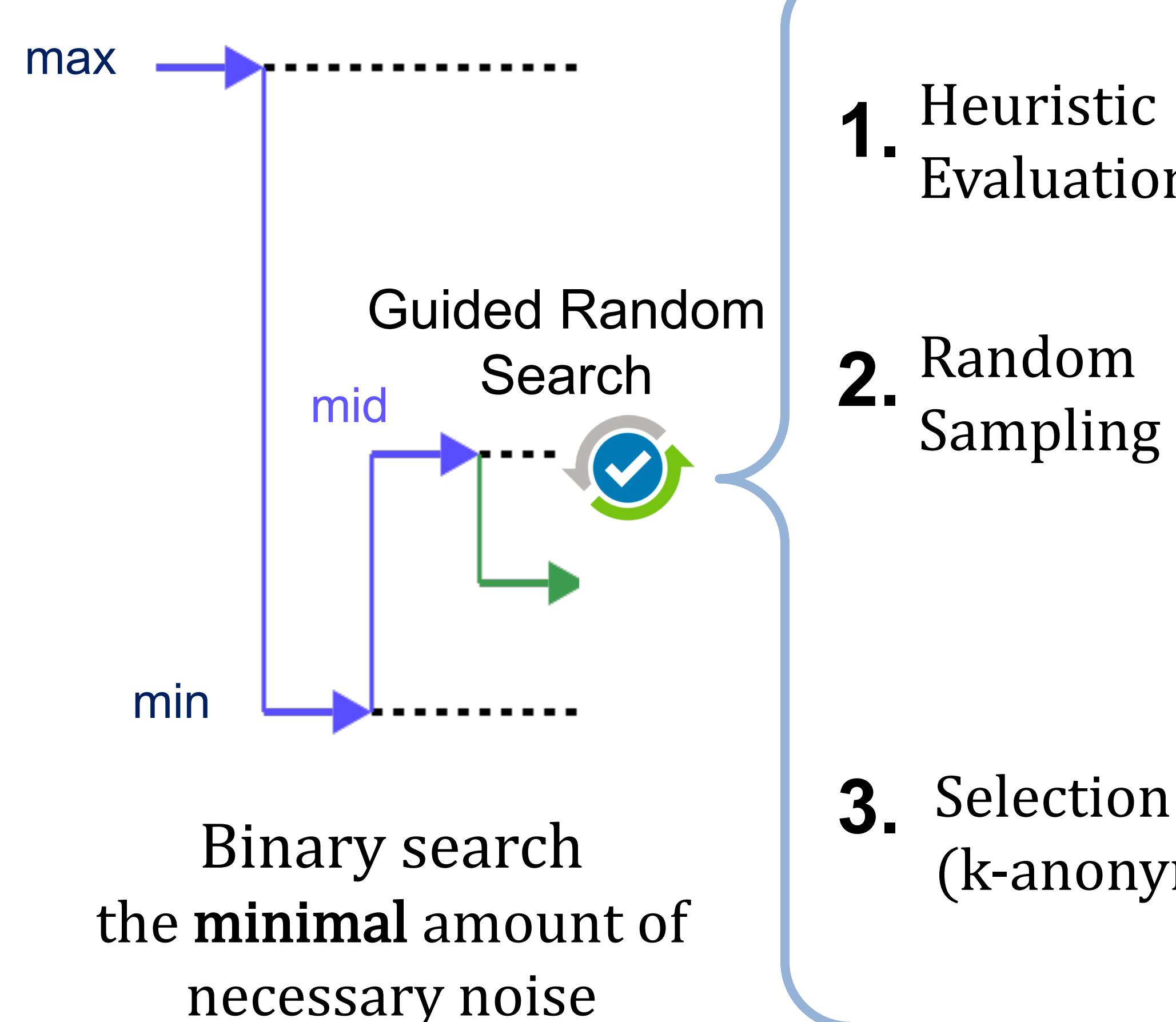
## Chameleon: Uncertain Graph Anonymization Solution

### Baseline Approach: Rep-An

- ✓ Combines isolated techniques
- ✓ Suffers from huge utility loss

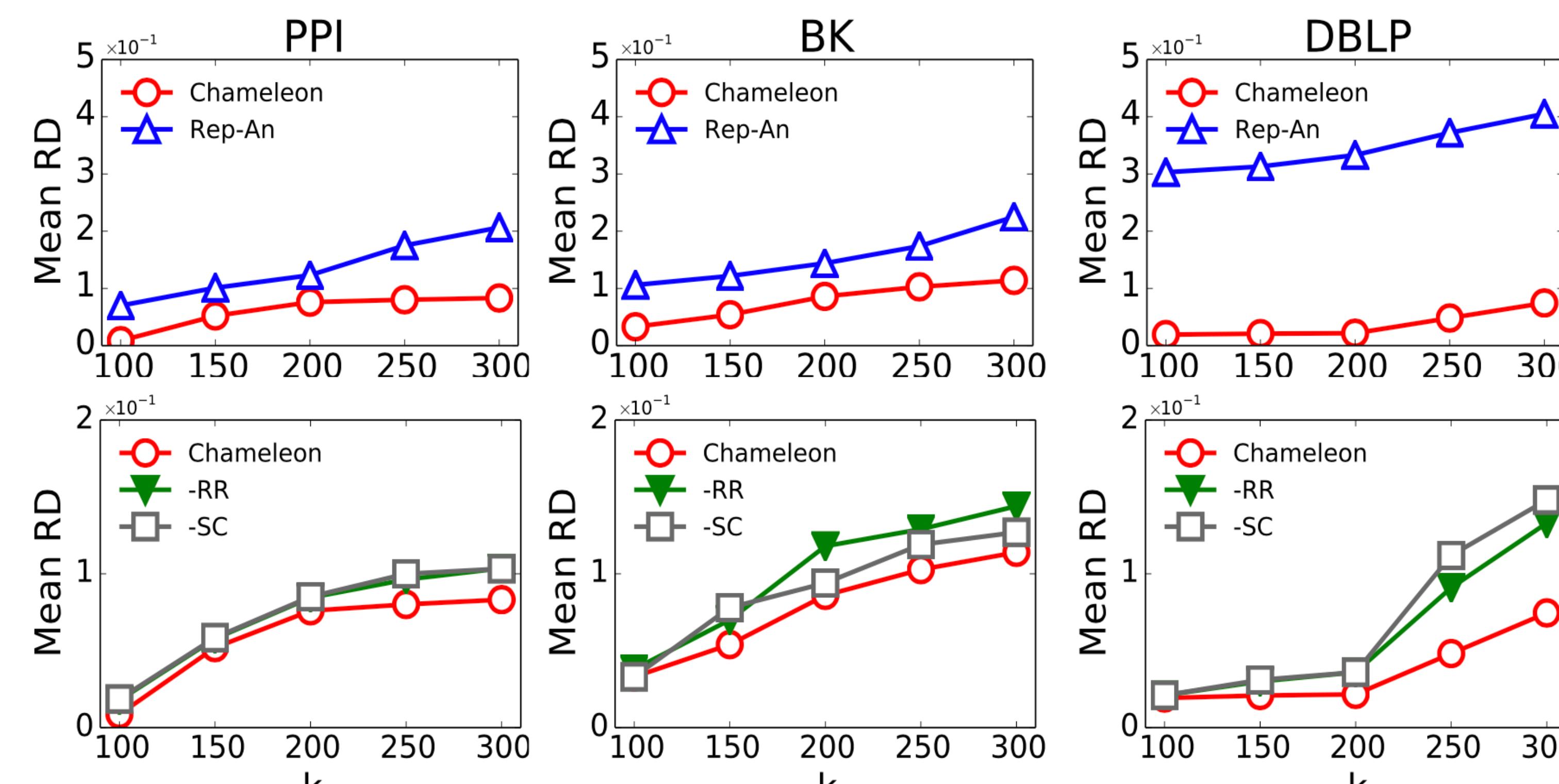


- ✓ With the possible world semantics
- ✓ Enables a fine-grained control of injected noise



NONE

## 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 .