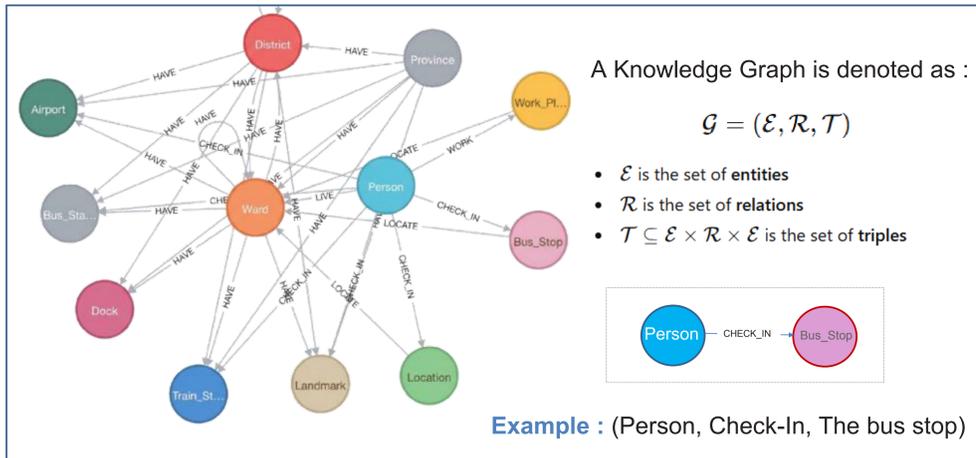
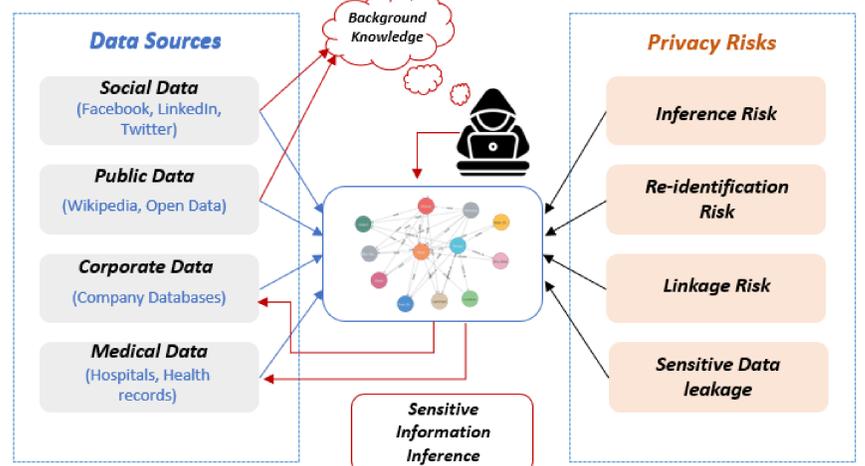


## Knowledge Graphs

### Overview

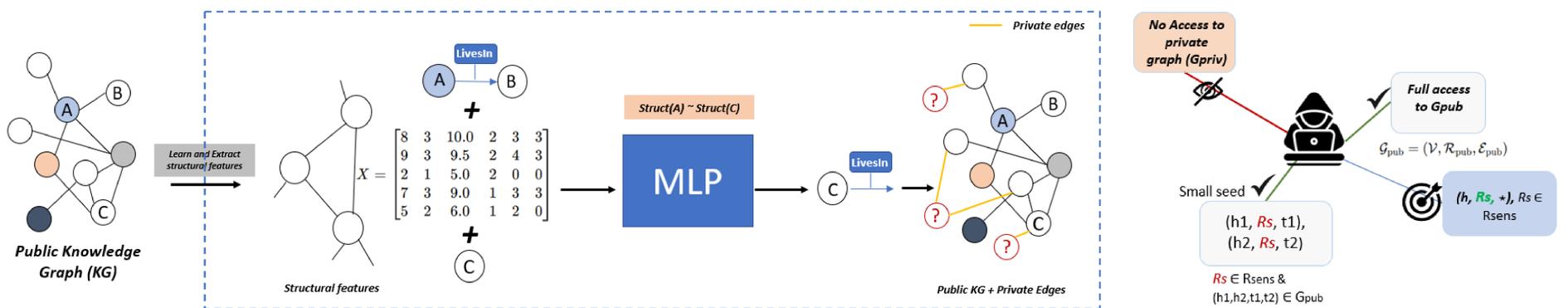


### Why Privacy is at Risk in KGs ?

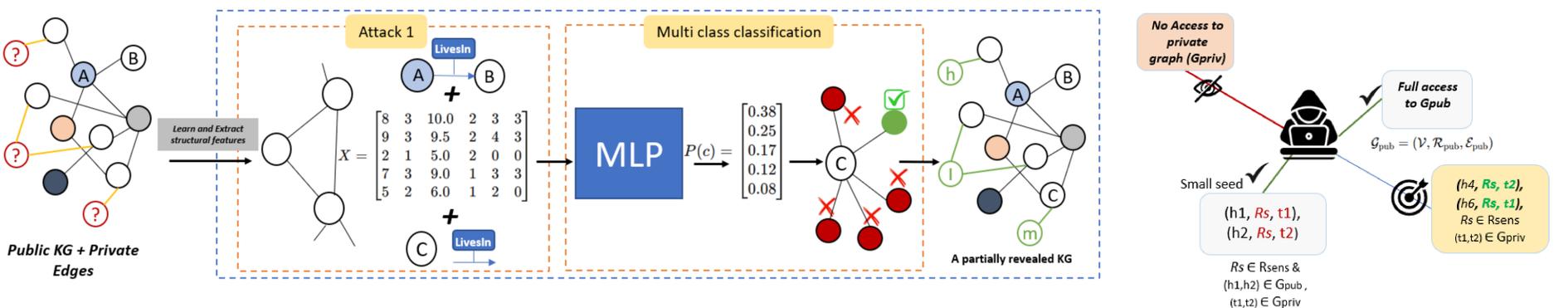


## Novel Privacy Threats in Knowledge Graphs

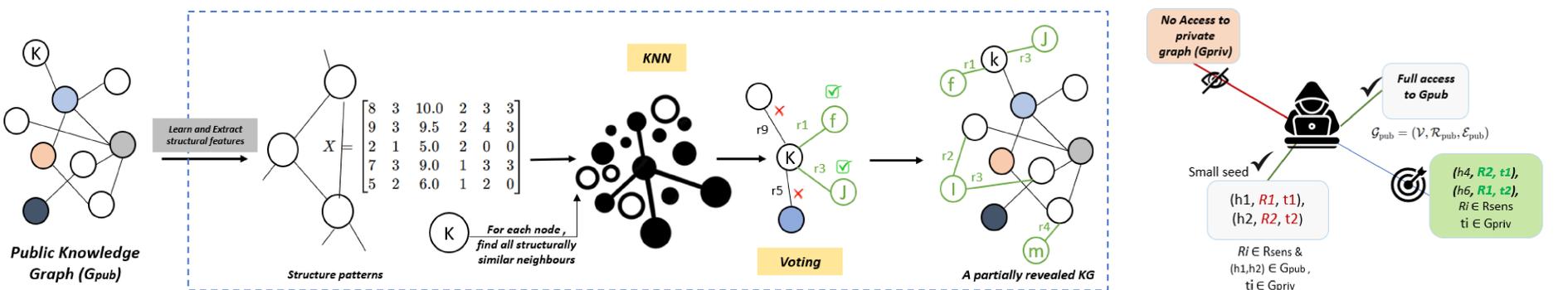
### Attack 1 : Embedding-Free Link Inference Attack



### Attack 2 : Embedding-Free Sensitive Attribute Inference Attack



### Attack 3 : Embedding-Free Private Knowledge Graph Reconstruction



## Evaluation

Dataset	Attack1 (Relation Existence)		Attack2 (Attribute Inference)			Attack3	
	Metric	Random	Attack	Metric	Random	Attack	PR-AUC
DBpedia	PR-AUC	≈0.004	0.9512	PR-AUC	0.125	0.5703	0.251
Wikidata	PR-AUC	≈0.008	0.7258	PR-AUC	0.0625	0.4971	0.906
Health-KG	PR-AUC	≪0.01	~0.95	PR-AUC	0.25	0.534	0.841
Synthea	PR-AUC	≈0.14	~0.537	PR-AUC	0.05	0.558	0.877

**Conclusion:** These results show that privacy risks in Knowledge Graphs are inherently structural and persist even without access to embeddings. Our attacks demonstrate that Knowledge Graphs alone can lead to significant privacy leakage.