# Differential privacy in relational or graph databases

**Project:** This internship is part of project Semantic Networks of Data: Utility and Privacy (SENDUP[1]) that studies data privacy in graph databases (e.g., RDF) with underlying semantics.
**Laboratory & Team:** LIFO, Systems and Data Security team, INSA Centre Val de Loire, 88 boulevard Lahitolle 18022 Bourges
**Duration and start:** 5 to 6 months, at the candidate's earliest convenience.
**Contact:** to apply or request additional information, send a mail and a resume to adrien.boiret@insa-cvl.fr
**Requirements:**

- Master, Bac +5 in computer science / engineering or equivalent
- Knowledge or interest about databases (especially graph databases, e.g. RDF) and data privacy
- Ability to read and write english documents
- Proficiency in a coding language (preference for Java)
- Willingness to work in autonomy and in a team

**Subject:**

Data safety and privacy are concerns currently receiving intense attention, notably through the introduction of GDPR reglementations that aim to ensure data collection, treatment, and publication never trespass on a person's right to privacy. The notion of differential privacy (DP) grew popular as a yardstick of privacy for data publication processes, where a database containing sensitive information can still answer queries without compromising privacy.

Previous works established methods to guaranty DP for publication processes in graph databases (e.g. RDF databases). However, the use and study of databases is generally centered around relational databases through languages like SQL. Works on privacy are no exceptions. This presents a challenge when trying to compare the efficacy of a newly proposed method on graphs to existing methods in relational databases, as methods and metrics have no clear translation from one to the next.

In this internship, we aim to design and implement translation methods between graphs and relational databases, as well as their metrics. Furthermore, we want to compare the efficacy of some methods to guaranty DP in graph databases to that of methods in graphs aiming at similar results.
**Goals and Objectives:**

- Implementation of relational-to-graph and graph-to-relational databases translation methods
- Establishment of a benchmark to compare the efficacy of different privacy methods through translation

**Keywords:** Data privacy, Differential privacy, Databases, Graph databases, Relational databases

[1] https://www.univ-orleans.fr/lifo/evenements/sendup-project/