ProbTree: A Query-Efficient Representation of Probabilistic Graphs

**ProbTree Data Structure**

- **Objective:** efficiently execute probabilistic source-to-target queries
- **ProbTree:** data structure able to retrieve equivalent graphs for a source-to-target query
- Based on tree decompositions — SPQR trees of independent triconnected components
- Supported by two operators:
  1. **Index:** pre-compute the ProbTree via SPQR decomposition and pre-computation of distance probabilities
  2. **Retrieve:** given a query, efficiently retrieve the equivalent graph for result computation

**Efficiency and Effectiveness**

- **ProbTree** is efficient in retrieving equivalent graphs and computing source-to-target queries
- **ProbTree** is effective and can increase the accuracy of the query answers, needing fewer samples than other algorithms