ProbTree: A Query-Efficient Representation of Probabilistic Graphs

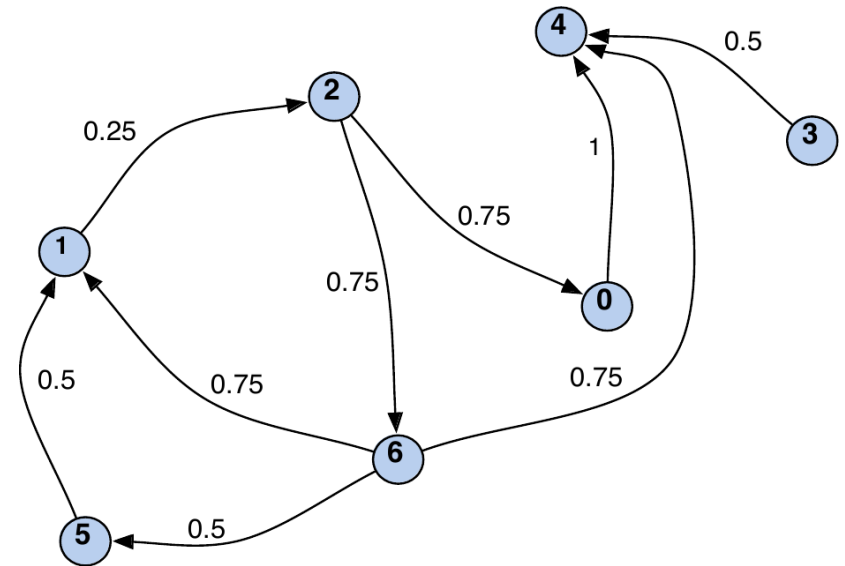Silviu Maniu   Reynold Cheng   Pierre Senellart

BIG **U**NCERTAIN **DA**TA

Query answering on probabilistic graphs

- Graph with independent probabilistic edges
- Reachability, shortest distance #P-hard
- Monte-Carlo approx. possible, but costly on large graphs
- Main idea: exploit the structure of the graph to build tractable tree decompositions

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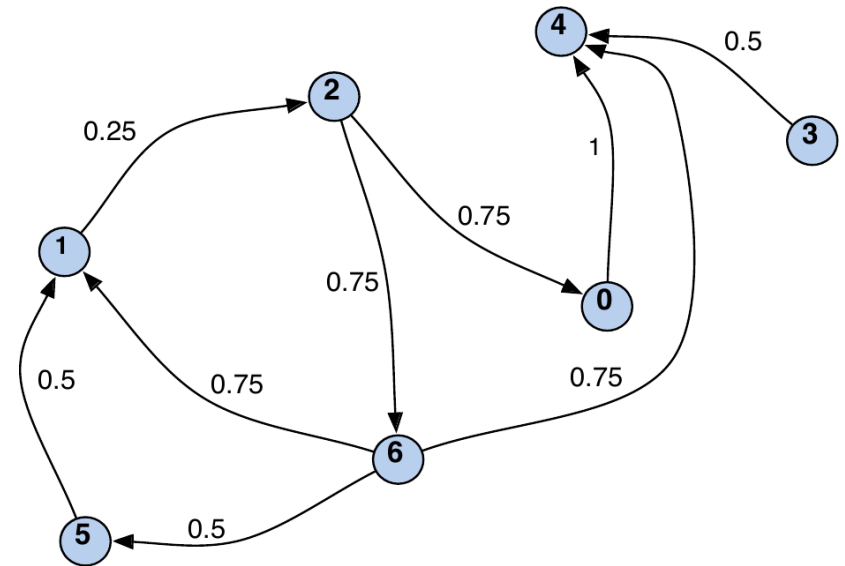
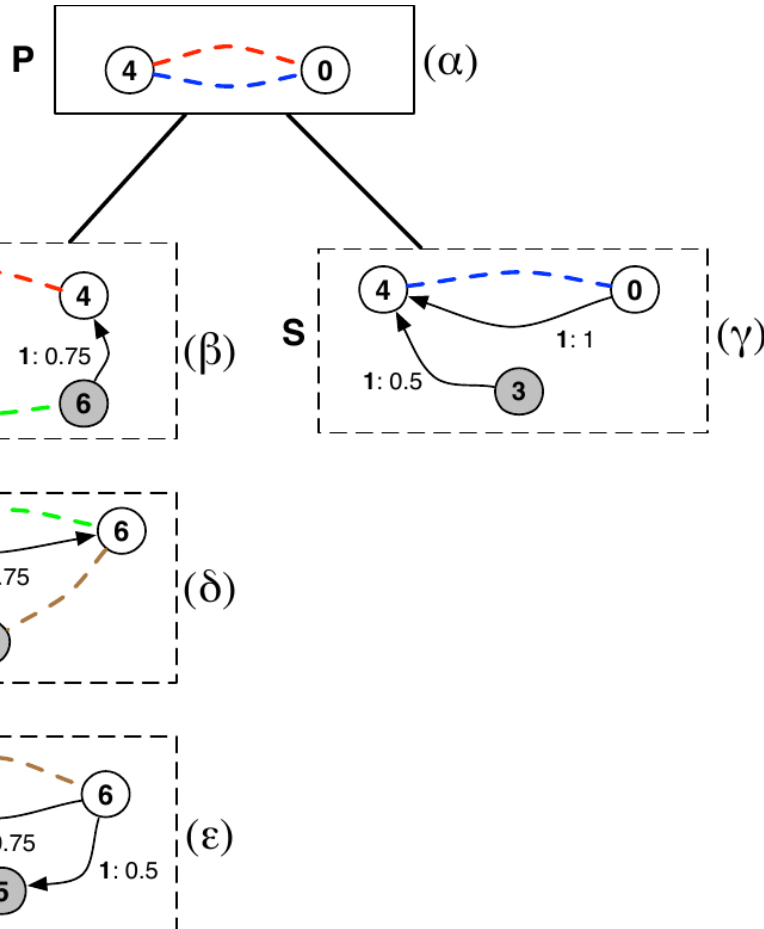Example: decompose the graph into triconnected componnents
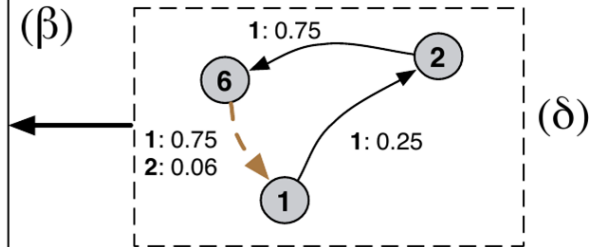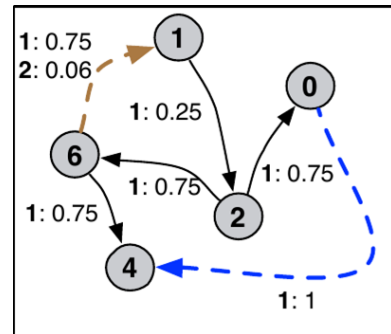
Tree decomposition and retrieval
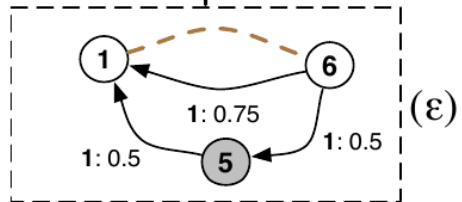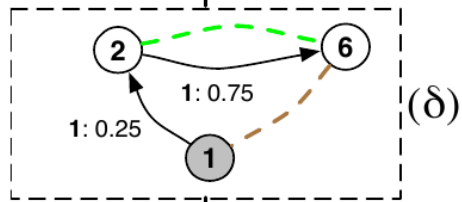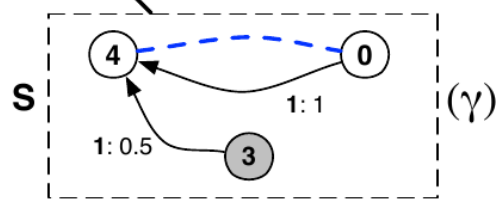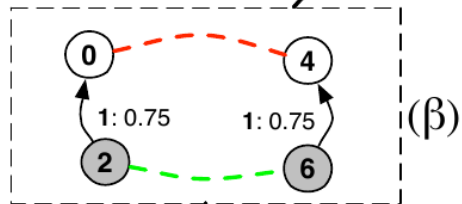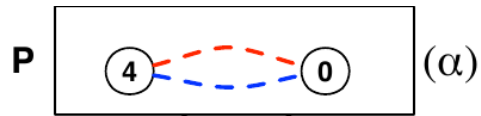
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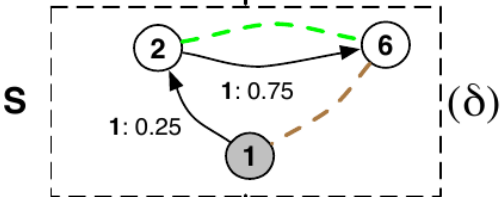Query: shortest distance from 1 to 4?

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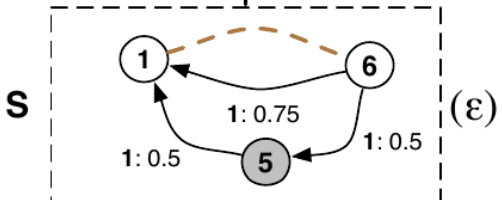
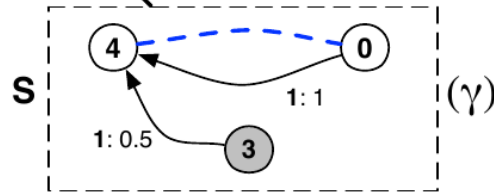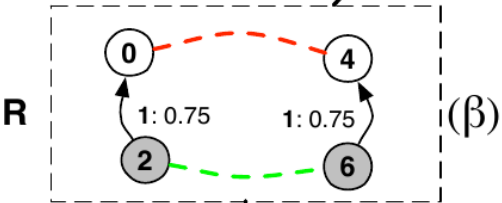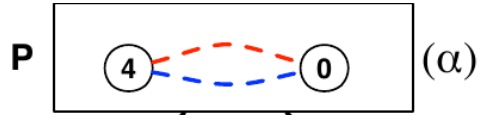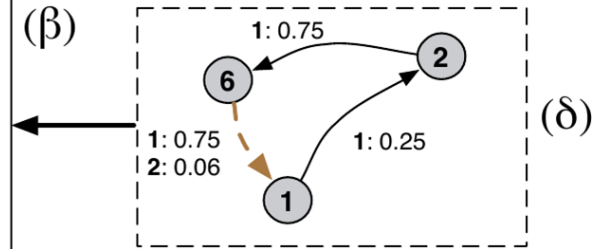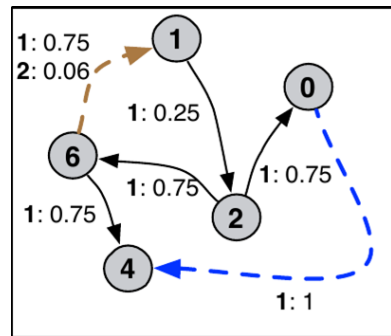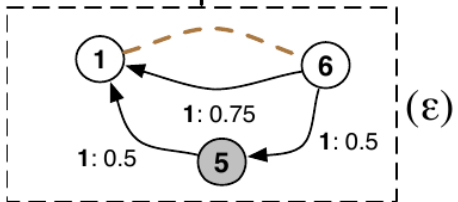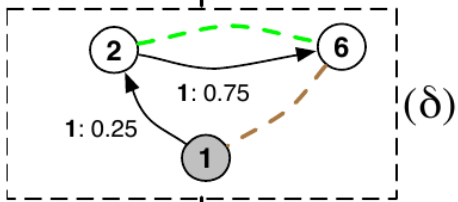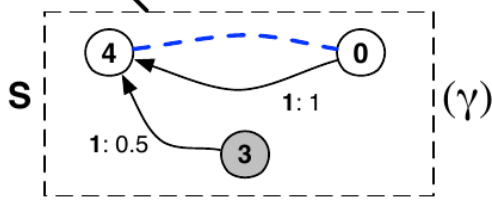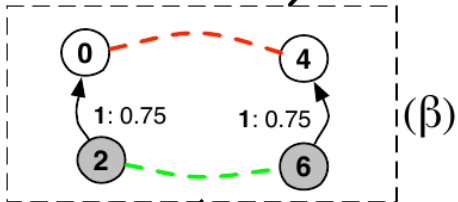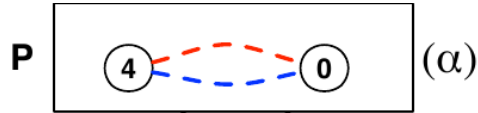# Tree decomposition and retrieval

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Smaller graph to sample (or compute exactly) from!