Meta-Property Graphs: Extending Property Graphs with Metadata Awareness and Reification

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The ISO standard Property Graph model has become increasingly popular for representing complex, interconnected data. However, it lacks native support for querying metadata and reification, which limits its abilities to deal with the demands of modern applications. We introduce Meta-Property Graphs, a backwards compatible extension of the property graph model addressing these limitations. Our approach enables first-class treatment of labels and properties as queryable objects and supports reification of substructures in a graph. We also propose MetaGPML, a backwards compatible extension of the Graph Pattern Matching Language forming the core of the ISO standards GQL and SQL/PGQ, to query these enhanced graphs. We demonstrate how these foundations pave the way for advanced data analytics and governance tasks that are challenging or impossible with current property graph systems. Further details can be found in the technical report [1].

References

[1] Sepehr Sadoughi, Nikolay Yakovets, George Fletcher (2024). Meta-Property Graphs: Extending Property Graphs with Metadata Awareness and Reification. arXiv:2410.13813.