

New Perspectives on Query Reformulation

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This talk will discuss a very general notion of query reformulation: Given a query Q , a set of constraints Σ , a target query language or programming language, and a cost metric, determine if there is an object in the target language that is equivalent to Q relative to the constraints, and if so find such an object optimizing the cost metric. The problem has a long history in the database community, originally motivated by querying over materialized views. This talk will go over several very recent developments – from a database perspective, but mentioning the relationship to description logics.

We will first go over the connection between reformulation and interpolation/preservation properties, originating in the work of Nash, Segoufin, and Vianu, and show how this can be extended to give a very elegant theoretical framework for studying the reformulation problem. After that we will turn to performing interpolation and reformulation directly over a physical plan language, rather than a query language. This will include a discussion of:

- how to extend traditional cost-based query optimization to the setting of constraint-based reformulation
- how to “plug in” reasoners, particularly those for expressive decidable logics (guarded negation, guarded TGDs), into the reformulation process.

This includes work with Balder ten Cate, Julien Leblay, Efi Tsamoura, and Michael Vanden Boom.