

# Conditional via Unconditional Rewriting – Some Recent Developments

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## Abstract

Conditional term rewriting systems (CTRSs) naturally arise in many settings, but are well-known to be substantially more complex and involved than unconditional ones (TRSs), concerning both the theoretical analysis and their practical realization. For this reason, various transformational approaches have been designed in the past in order to simulate CTRSs via TRSs. These approaches are appealing in the sense that the rich knowledge about unconditional term rewriting and its implementation becomes readily applicable for conditional rewriting. On the other hand, various basic issues and questions about such transformational approaches are still not yet fully understood.

In the talk we will report on our recent and ongoing research efforts that concentrate on some crucial questions in the area. First of all, we will sketch a unifying framework for such transformations that covers most of the existing approaches. One major advantage of this general approach is a systematic and unified terminology for properties of such transformations, e.g. preservation properties like soundness and completeness. Second, we will deal with the precise relationships between (properties of) CTRSs and their transformed TRSs and show that via imposing certain (context-sensitivity) restrictions on rewriting in the transformed TRSs remarkably precise relationships and characterizations become possible. Finally, we will also discuss one of the main inherent problems of such transformational approaches, namely unsoundness (w.r.t. simulating the original system), in more depth. Via a refined analysis we are able to shed some new light on the essential sources of this unsoundness phenomenon and to derive a couple of new sufficient conditions that guarantee soundness of the underlying transformation.