Context-sensitive rewriting as pioneered by S. Lucas since 1995 has turned out to be a remarkably fruitful concept in many respects. Still, various examples and problems cannot be treated in a satisfactory way within this framework, because the underlying notion of context-sensitivity is too rigid and specialized. From a systematic point of view, it is only a very special case of a more general concept of context-sensitivity. In our contribution we will discuss more general versions of context-sensitivity, the relationships among them and the commonly used notion of context-sensitivity, as well as their feasibility from a computational point of view. In particular, we will present an extended approach for context-sensitivity that is based on the notion of “forbidden patterns” which appears to be a reasonable compromise between expressive power and practical feasibility. The basic idea here is that a rewrite step should be forbidden if the redex to be contracted has a certain shape and appears in a certain context.

Currently, our work is focussing on the definition of criteria that guarantee finiteness (i.e. termination) and completeness of rewriting with forbidden patterns, where by completeness we mean the ability to simulate certain unrestricted derivations (e.g., head-normalizing ones) by restricted rewriting. In the work presented at WRS’09 some criteria of this kind were presented. However, these were restricted to certain classes of forbidden patterns and were not easy to check automatically. We expect to generalize and improve upon these results in the course of the next year and to present this progress at the Austria Japan Workshop on Rewriting in 2010 (joint work with Bernhard Gramlich).