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Path–controlled grammars

The motivation for regulated derivations of context–free grammars comes from the fact that many languages of interest are not context–free. Generating such languages using context–sensitive grammars is not ideal from practical point of view as many problems for these grammars are undecidable.

It is believed that the first regulating mechanism was introduced in 1965, by S. Abraham. *Matrix grammars* place restrictions on the order in which rewriting rules are applied in derivation steps. In the same year, I. Bellert published a paper, describing several interesting ideas of regulated rewriting. Interestingly enough, these ideas were not studied after that for a long time.

In this lecture I will introduce one of the mechanisms, *path–controlled grammars*. This mechanism imposes restrictions on the paths in a derivation tree of a context–free grammar. Formal definition of *path–controlled grammars* as well as definition of a languages generated by these grammars will be shown, with some simple examples. The generative power and pumping properties will be discussed.