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Dependency Parsing Schemata and Mildly Non-Projective Dependency Parsing

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Abstract Authors

We introduce dependency parsing schemata, a formal framework based on Sikkel's parsing schemata for constituency parsers, which can be used to describe, analyze, and compare dependency parsing algorithms. We use this

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framework to describe several well-known projective and non-projective dependency parsers, build correctness proofs, and establish formal relationships between them. We then use the framework to define new polynomial-time parsing algorithms for various mildly non-projective dependency formalisms, including well-nested structures with their gap degree bounded by a constant k in time $O(n^{5+2k})$, and a new class that includes all gap degree k structures present in several natural language treebanks (which we call mildly ill-nested structures for gap degree k) in time $O(n^{4+3k})$. Finally, we illustrate how the parsing schema framework can be applied to Link Grammar, a dependency-related formalism.

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