
io-port 00043628**Hausser, Roland****Computation of language. An essay on syntax, semantics, and pragmatics in natural man-machine communication.**

Symbolic Computation - Artificial Intelligence. Berlin etc.: Springer- Verlag. XVI, 425 p. DM 88.00 (1989).

The basic assumptions of left-associative (LA-) grammar are: (1) The natural language (NL) grammar is defined as a system which constructs a decidable, bidirectional, surface-meaning mapping; (2) The formal design of the surface-meaning mapping is based on (i) a time-linear derivation order, (ii) a simultaneous derivation of syntax and semantics, and (iii) a surface-compositional homomorphism between linear syntax and hierarchical semantics; (3) Semantic representations of sentences are defined as minimal databases; (4) Pragmatic interpretation is defined as unification of the semantic representation and the internal utterance context; (5) The grammar system must be “type-transparent” with respect to associated parsers. In LA-grammar, as a finite state automaton, a transition depends on the current state, the category of the expression analysed so far (called sentence-start category), and the next word. LA- grammar differs from all known technical tools and systems of NL analysis in that it computes the possible continuations for the next word, whereas the other systems compute predictions for constituents. The book is divided into three parts, each one containing five chapters, and three appendices. Part I (NL and Formal Grammar) represents a thorough discussion on the linguistic adequacy of LA-grammar, comparisons with the derivational structures of Montague’s grammar, and of the Chomsky’s government and binding grammar, and more general, with the categorial and the phrase-structure grammars are done. Since LA-grammar is based on a strictly linear-time derivation order, it entails an input-output equivalence with parser and generators, as well as with the speaker- hearer (!). Part II (Algebraic and automata-theoretical characterization) gives a technical (mathematical) analysis of the LA-grammar place within Chomskyan linguistic hierarchy (or other new-introduced useful hierarchies). The main result is that LA-grammar accepts and generates at most but all recursive languages. The LA-grammar relationship with automata, decidability, and computational complexity results are obtained. Part III (logic and communication) analyses fragments of a theory of NL communication, containing a general theory of pragmatics, applied to different types of signs, its relationship to semantics (traditional theories of philosophical logic and model theory), and to surface-compositional syntax. The Appendices describe different aspects of the LA-grammar for English (ECAT): (1) The category segments and categories; (2) Seven sample derivations; and (3) The current set of sample sentences. As professor Dana Scott pointed out in his interesting preface to the book, the author’s basic idea is “the balance and interplay he achieves in controlling the exploration of continuations through the information contained in his categories, and the ways he transforms the categories in his rules”. If from linguistic and computational linguistics points of view the problems are still under discussion, I emphasize an important point whose gain is for sure: the LA-grammar linguistic relationship to speech processing can be considered as theoretically founded. The book is an essay, based on a great effort and concrete results, to support an idea that could prove, in the perspective of time, be fruitful.

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