

On the Syntactic Complexity of Parallel Communicating Grammar Systems

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Abstract: We compare the complexity of generating a language by a context-free grammar or by a parallel communicating grammar system (*PCGS*), in the sense of Gruska's measures *Var*, *Prod*, *Symb*. Then we define a specific measure for *PCGS*, *Com*, dealing with the number of communication symbols appearing in a derivation. The results are the expected ones: the *PCGS* are definitely more efficient than context-free grammars (the assertion will receive a precise meaning in Section 2), the parameter *Com* introduces an infinite hierarchy of languages, is incomparable with *Var*, *Prod*, *Symb*, and cannot be algorithmically computed.

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