

**Graph structure and monadic second-order logic,
a language-theoretic approach**

by Bruno Courcelle and Joost Engelfriet

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Updates and errata

Updates

Page 555: The answer to Question 7.43 is positive.

A set R -structures L satisfies the *semi-linearity property*, if, for every CMS formula $\varphi(X_1, \dots, X_k)$, the set of k -tuples of cardinalities of the components of the tuples (X_1, \dots, X_k) that satisfy φ in some structure of L is semi-linear. Then, the image of such a set under a CMS-transduction satisfies also the semi-linearity property.

Proof sketch: This is an easy consequence of Theorem 7.10 (the *Backwards Translation Theorem*) and the observation that, if in a semi-linear subset of \mathbb{N}^k , we replace each tuple (n_1, \dots, n_k) by $(n_1 + n_2, n_3, \dots, n_k)$ we get a semi-linear subset of \mathbb{N}^{k-1} .

Errata

Page 468, Table 6.11. The conditions for the transitions of the form $add_{a,b}[(2, \{A, A'\}, B)] \rightarrow q$ are incorrect.

The state q should be Ok if :

$$(a \in A \text{ and } b \in A') \text{ or } (b \in A \text{ and } a \in A') \\ \text{or } (a \in A \cap A' \text{ and } (b, b) \in B) \text{ or } (b \in A \cap A' \text{ and } (a, a) \in B).$$

Otherwise, q should be $(2, \{D, D'\}, B')$ with D, D', B' as in Table 6.11.

The same error occurs in Table 11, page 386 of the article:

B. Courcelle, I. Durand: Automata for the verification of monadic second-order graph properties, *J. Applied Logic* **10** (2012) 368-409.

Page 710, replace reference [Wey] used on pages 423 and 686 by :

K. Reinhardt: The Complexity of Translating Logic to Finite Automata, in Automata, Logics, and Infinite Games Lec. Notes Comp. Sci. **2500** (2002) 231-238.

Page updated September 2014.