Problem #72

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> *Summary: Give a definition of graph transduction that extends rational word transductions.*

Graph rewritings, like term or word rewritings, are usually finitely branching. There are relations that are not finitely branching, yet satisfy good properties: rational transductions of words, tree-transductions. A good definition of graph transduction, that extends rational word transductions is still lacking.

Remark

See [Cou94, Cou97].

Comment sent by Bruno Courcelle

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My notion of monadic second-order transduction of graphs, hypergraphs and relational structures is in my opinion the equivalent of tree and word transductions. However, if a graph is given with a tree-structure, then a transducer can be based on this tree: it can produce an algebraic expression defining, after evaluation, the desired object graph, hypergraph etc...

References: [Cou94, Cou97, CK02]

Bibliography

[CK02]   Bruno Courcelle and Teodor Knapik. The evaluation of first-order substitution is monadic second-order compatible. *Theoretical Computer Science*, 281(1–2):177–206, June 2002.

[Cou94] Bruno Courcelle. Monadic-second order graph transductions: A survey. *Theoretical Computer Science*, 126:53–75, 1994.

[Cou97] Bruno Courcelle. The expression of graph properties and graph transformations in monadic second-order logic. In G. Rozenberg, editor, *Handbook of graph grammars and computing by graph transformations, vol. 1: Foundations*, chapter 5, pages 313–400. World Scientific, New-Jersey, London, 1997.

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