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HOMOMORPHIC SIMULATION AND LETICHEVSKY'S CRITERION [1, 2]

PÁL DÖMÖSI

Institute of Mathematics and Informatics, University of Debrecen
Egyetem tér 1, H-4032, Debrecen, Hungary
e-mail: domosi@math.klte.hu

and

ZOLTÁN ÉSIK

Department of Computer Science, University of Szeged
Árpád tér 1, H-6720 Szeged, Hungary
e-mail: esik@inf.u-szeged.hu

In honour of Professor MASAMI ITO on his 60^{th} birthday.

ABSTRACT

Using the Krohn-Rhodes Decomposition Theorem and the Letichevsky Decomposition Theorem, we prove that there is a finite class of automata which is complete with respect to the homomorphic representation (and simulation) under the general product but not complete with respect to the homomorphic simulation under the ν_2-product.

Keywords: composition of automata.

1. Introduction

Products of automata, transducers and other abstract models of computational devices play an important role in theoretical computer science. In order to decrease the complexity of the general product, F. GÉCSEG [12] introduced a family of semi-cascade products, called α_i-products, where the index i is a nonnegative integer which denotes the maximal admissible length of feedbacks.[3] B. IMREH [17] characterized the isomorphically complete classes under the α_i-products. Z. ÉSIK [8] proved that Letichevsky's

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[3] In a linearly ordered sequence of automata, a feedback of length i to the j-th component connects the $i + j - 1$st component to the j-th, so that a feedback of length 1 connects a factor to itself.