

# Blockmodeling of fuzzy transition systems using approximate regular relations\*

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## Abstract

For a fuzzy automata over complete Heyting algebra, the  $\lambda$ -approximate bisimulations are recently defined and used for factorization of automata. These relations are shown to be very good means for constructing the models, which are similar at the degree  $\lambda$ , to the original automata, but with the much smaller size. Based on this methodology, in current work, we investigate the  $\lambda$ -approximate regular fuzzy relations on the fuzzy transition systems over complete residuated lattices. We provide an algorithm for determining the  $\lambda$ -approximate regular fuzzy relations which are preorders. Afterward, we use these preorders for reduction of fuzzy transition systems. At the end, we propose a method for determining all values  $\lambda$ , such that reduction by means of  $\lambda$ -approximate regular preorders produces the system of a different size.

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\*Research supported by Ministry of Education, Science and Technological Development, Republic of Serbia, Grant No. 174013

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