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**Probabilistic Simple Sticker Systems**

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**Abstract**

A model for DNA computing using the recombination behavior of DNA molecules, known as a sticker system, was introduced by L. Kari, G. Paun, G. Rozenberg, A. Salomaa, and S. Yu in the paper entitled DNA computing, sticker systems and universality from the journal of Acta Informatica vol. 35, pp. 401-420 in the year 1998. A sticker system uses the Watson-Crick complementary feature of DNA molecules: starting from the incomplete double stranded sequences, and iteratively using sticking operations until a complete double stranded sequence is obtained. It is known that sticker systems with finite sets of axioms and sticker rules generate only regular languages. Hence, different types of restrictions have been considered to increase the computational power of sticker systems. Recently, a variant of restricted sticker systems, called probabilistic sticker systems, has been introduced [4]. In this variant, the probabilities are initially associated with the axioms, and the probability of a generated string is computed by multiplying the probabilities of all occurrences of the initial strings in the computation of the string. Strings for the language are selected according to some probabilistic requirements. In this paper, we study fundamental properties of probabilistic simple sticker systems. We prove that the probabilistic enhancement increases the computational power of simple sticker systems.

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