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AIP Conference Proceedings
Volume 1830, 27 April 2017, Article number 020057
4th International Conference on Mathematical Sciences - Mathematical Sciences: Championing the Way in a Problem Based and Data Driven Society, ICMS 2016; Putrajaya; Malaysia; 15 November 2016 through 17 November 2016; Code 127506

Probabilistic simple sticker systems (Conference Paper)

Selvarajoo, M.^a, Heng, F.W.^b, Sarmin, N.H.^b, Turaev, S.^c

^aFaculty of Computer Science and Mathematics, Universiti Teknologi MARA Kelantan, Machang, Kelantan, Malaysia

^bDepartment of Mathematical Sciences, Faculty of Science, Universiti Teknologi Malaysia, UTM Johor Bahru, Johor, Malaysia

^cDepartment of Computer Science, Kulliyyah of Information and Communication Technology, International Islamic University Malaysia, Kuala Lumpur, Selangor, Malaysia

Abstract

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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. © 2017 Author(s).

ISSN: 0094243X
ISBN: 978-073541498-3
Source Type: Conference Proceeding
Original language: English

DOI: 10.1063/1.4980920
Document Type: Conference Paper
Volume Editors: Dzul-Kifli S.C., Zamzuri Z.H., Razak F.A., Zin W.Z.W.
Sponsors:
Publisher: American Institute of Physics Inc.

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
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 Selvarajoo, M.; Faculty of Computer Science and Mathematics, Universiti Teknologi MARA Kelantan, Machang, Kelantan, Malaysia; email:mathuri644@kelantan.uitm.edu.my

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