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AIP Conference Proceedings

Volume 1974, 28 June 2018, Article number 030015

25th National Symposium on Mathematical Sciences: Mathematical Sciences as the Core of Intellectual Excellence, SKSM 2017; Kuantan, Pahang; Malaysia; 27 August 2017 through 29 August 2017; Code 137617

Closure properties of Watson-Crick Petri net (Conference Paper)

Jan, N.M.^a [✉](#), Heng, F.W.^a [✉](#), Sarmin, N.H.^a [✉](#), Turaev, S.^b [✉](#) [🔍](#)^aDepartment of Mathematical Sciences, Faculty of Science, Universiti Teknologi Malaysia, Johor Bahru, 81310 UTM, Malaysia^bDepartment of Computer Science, Kulliyah of Information and Communication Technology, International Islamic University Malaysia, Kuala Lumpur, 53100, Malaysia

Abstract

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A Watson-Crick Petri net is a model that enhances a Petri net with the Watson-Crick complementarity feature adapted from DNA molecules. The transitions of a Watson-Crick Petri net are labelled with pairs of symbols, and a firing sequence of transitions of the Watson-Crick Petri net is considered as successful if and only if it produces complete double-stranded sequences of symbols. In this research, the closure properties of Watson-Crick Petri net are determined under several operations such as concatenation, union, intersection and concurrent composition. Some new definitions of the closure properties are defined. Also, the generative power of Watson-Crick Petri net languages under the closure properties are discussed by some examples and theorems. It is shown that the family of Watson-Crick Petri net languages is closed under concatenation, union, intersection and concurrent composition. © 2018 Author(s).

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Author keywords

[Closure properties](#)
[Language](#)
[Petri net](#)
[Watson-Crick](#)

Funding details

| Funding sponsor | Funding number | Acronym |
|---|-----------------|---------|
| Universiti Teknologi Malaysia | | UTM |
| International Islamic University Malaysia | RIGS16-368-0532 | IUM |
| Centre for Teaching and Learning, Universiti Teknologi Malaysia | | CTL |
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Funding text

The first author would like to thank UTM for the UTM Zamalah Scholarship. The second author and third authors would also like to thank the Ministry of Higher Education (MOHE) and Research Management Centre (RMC), Universiti Teknologi Malaysia (UTM) for the financial funding through Research University Grant Vote No. 13H18. Also, the fourth author would like to thank MOHE and International Islamic University Malaysia (IIUM) for the financial funding through IIUM Research Initiative Grant Scheme RIGS16-368-0532.

ISSN: 0094243X

ISBN: 978-073541681-9

Source Type: Conference Proceeding

Original language: English

DOI: 10.1063/1.5041659

Document Type: Conference Paper

Volume Editors: Maidinsah H., Sharif S.R., Rahman

W.E.Z.W.A., Akbarally A.B., Mohamed M., Mohamad D., Jaffar M.M.

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