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**Proceedings - UKSim 5th European Modelling Symposium on Computer Modelling and Simulation, EMS 2011**  
2011, Article number 6131204, Pages 144-149

ISBN: 978-076954619-3  
DOI: 10.1109/EMS.2011.16  
Document Type: Conference Paper  
Source Type: Conference Proceeding

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**UKSim 5th European Modelling Symposium on Computer Modelling and Simulation, EMS 2011; Madrid; 16 November 2011 through 18 November 2011; Category number E4619; Code 88409**

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## Event triggering estimation for cell-DEVS: Wildfire spread simulation case

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### Abstract

This paper aims to estimate the trigger event in the DEVS formalism by the Bayesian networks. To validate this approach, we develop a simulation tool for wildfire spread which could be used as decision making for fires control and containment. In fact, this work attempt to foster the integration between two concepts: Bayesian networks, known as powerful tools for representing uncertain events, and the DEVS formalism, a discrete event simulation formalism known by the modeling process of complex natural systems. Thus we have introduced Bayesian networks to show up fire spread graph and the probability of states transitions can be calculated by the use of the joint probability distribution. This probability is then introduced to the fire spread Cell-DEVS model in order to simulate wildfire propagation. The present paper stated as follows: Firstly we introduce the wildfire spread phenomena, we follow by describing some closely related works. After, we present the specification formalism DEVS and some of its extensions, then, we introduce Bayesian networks. Our approach is then presented and some simulations are done. At the end, we conclude this work with a conclusion and perspectives. © 2011 IEEE.

### Language of original document

English

### Author keywords

Bayesian Networks; Cell-DEVS; Discrete Event Systems Specifications; Modeling and Simulation; Wildfire Spread Simulation

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









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