**CD++ Model Data Form**

*Title:* DRUG CRIME CELLULAR AUTOMATA MODEL

*Type:*  (three dimensional)

*Acronym/Short name:*  x

*Purpose for which Developed:* To model and simulate the crime activities in relation to the consumption of hard drugs (cocaine, heroin etc.) in an area and influence on change of the crime activities with change in drug patterns (i.e. increase in the number of druggists in an area and effect of incapacitation)

*Other Applications for which it is Suitable*: x

*Date Developed/Implemented*: 18/11/2017

*Domain*:

*Description* (including characteristics):

In Assignment 2, the criminal activities in an area and the hard drug (cocaine and heroin) consumption has been modelled using Cell DEVS means of Cellular Automata model based on fact that the addiction to the criminal activities led to increased criminal activities [1]. The primary goal is to implement the **three-dimensional Drug Crime Cellular Automata model** [1]. The model also takes into account the implementation of *incapacitation* (treatment of druggists in hospitals) which tends to reduce the druggists/criminal activities in an area, thus influencing the scenario in a positive way. The model incorporates the four basic types of actors/characters: Susceptible Persons, Low Risk Persons, High Risk Persons, and Incapacitated persons which have been modelled as Cell DEVS atomic models coupled together to form Cell DEVS coupled model.

In Assignment 2, the various cell DEVS test models for the influence of druggist on the other persons in an area has been designed to analyze the spread of drug usage (normal probability distribution) and the various coupled Cell DEVS test models has been implemented, modelled and tested to study the peer associations, the drug usage patterns and criminality dependency.

*Links to Related Documents:*

[1] Vahid Dabbaghian, Valarie Spicer, Suraj K. Singh, Peter Borwein, Patricia Brantingham, *“The social impact in the high-risk community: A cellular Automata Model”,* Journal of Computational Science, ELSEVIER, pp. 238-246, 15June, 2011.

DOI: 10.1016/j.jocs.2011.05.008

*Short Title*: x

*URL*: <https://www.sciencedirect.com/science/article/pii/S1877750311000512>

*Description:* x

*Keywords* : Cellular Automata, Criminal Behavior, Drug use, High-Risk Community, Social Influence

*Developer(s):*

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**Comments:**

All the Cell DEVS models have been successfully implemented, complied (build) and simulated. The output files - .ma files, .log files, .pal files and .val files and .DRW files have been generated and the corresponding output has been recorded in .avi files in the form of video. It has been observed that all the models are working correctly.