Cellular Automata

Neo Nguyen[1]

[1]Undergraduate Student, Mathematical Sciences
Florida Atlantic University

Nonlinear Dynamical Systems, Fall 2020

Basis of Cellular Automata

Cellular automata are the structures created by the iterative operations done on a set of valued cells by a specified equation, or using the states of neighbouring cells, which can create very ordered structures.

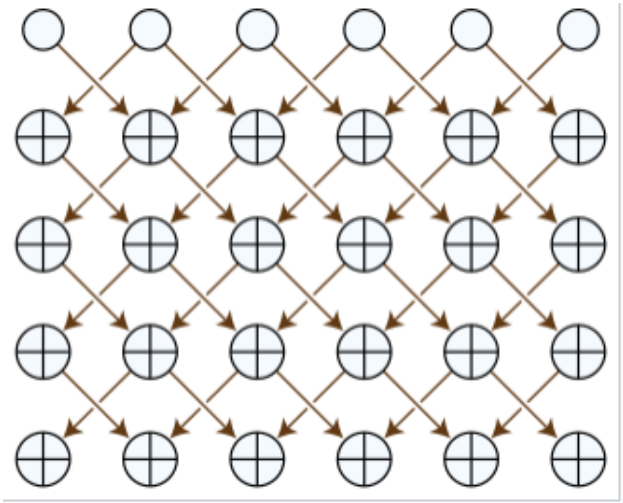
- Empirical Formula
- Neighbour States

Neighbour Cell State Rule

current pattern	111	110	101	100	011	010	001	000
new state for center cell	0	1	0	1	1	0	1	0

The above image describes the rules based on the above cell states.

Empirical Formula



```
X[i,j] = (rule/(2**(4*X[i-1,j-1] + 2*X[i-1,j] + X[i-1,j+1]))) % 2
```

The above image describes the basis of the formula, which is equivalent to the previously noted.