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<u>**Paper Referred**</u>**:**
1. Stochastic Cellular Automata Model for Stock Market Dynamics
(By **Marco Bartolozzi** and **Anthony William Thomas)**

<u>Aim</u>: Cellular Automata based Modelling of Cryptocurrency.

Abstract:

In this work, it has been tried to showcase the **Dynamics of the Stock Market** with the help of a **2D Cellular Automata**.

The **Active Traders** are characterised by the states **+1(*Buying Stocks*)** and **-1(*Selling Stocks*)**.

The **Inactive Traders** are characterised by **0 State**.

Some Simulation Rules(For changing the State of the Traders from Active to Inactive and Vice Versa) are applied and the simulation is done.

Based on that Simulation, some Graphs are plotted.

After that, Simulation rules are Tweaked.
Instead of checking the Neighbours and keeping the condition on the basis of **at least 1 Neighbour** in the Simulation Rules, 'k' and 'l' Neighbours are respectively checked for the Rule(1) and Rule(2) of Simulation where 'k' and 'l' are taken from the Set {1,2,3,4}.

Graphs are obtained and along with that some Drastic Changes are also observed in the Dynamics of the Market.

We witness the **Strictly Increasing** Graphs of the Simulation to become sometimes **Strictly Decreasing** when the 'k' and 'l' values are Increased.

In the later part of the analysis, we take The **Global Neighbourhood Condition** for the Simulation to resemble the Real Life Stock Market.

These Neighbours are **Fully Random** in nature.
Since, we are considering 512×128 Grid, so we have 65,536 cells and out of those cells, these Global Neighbours are **Randomly Chosen** and preferably they don't collide with the Local Neighbours.

There we observe some Interesting Changes in the Dynamics of the Market. The Graphs remain **Strictly Increasing** for a very long extent of time as compared to the Initial Model.

In future, we plan to test the model on the **S&P500** dataset.