

Rule 30 report

Fi Simulator

November 10, 2019

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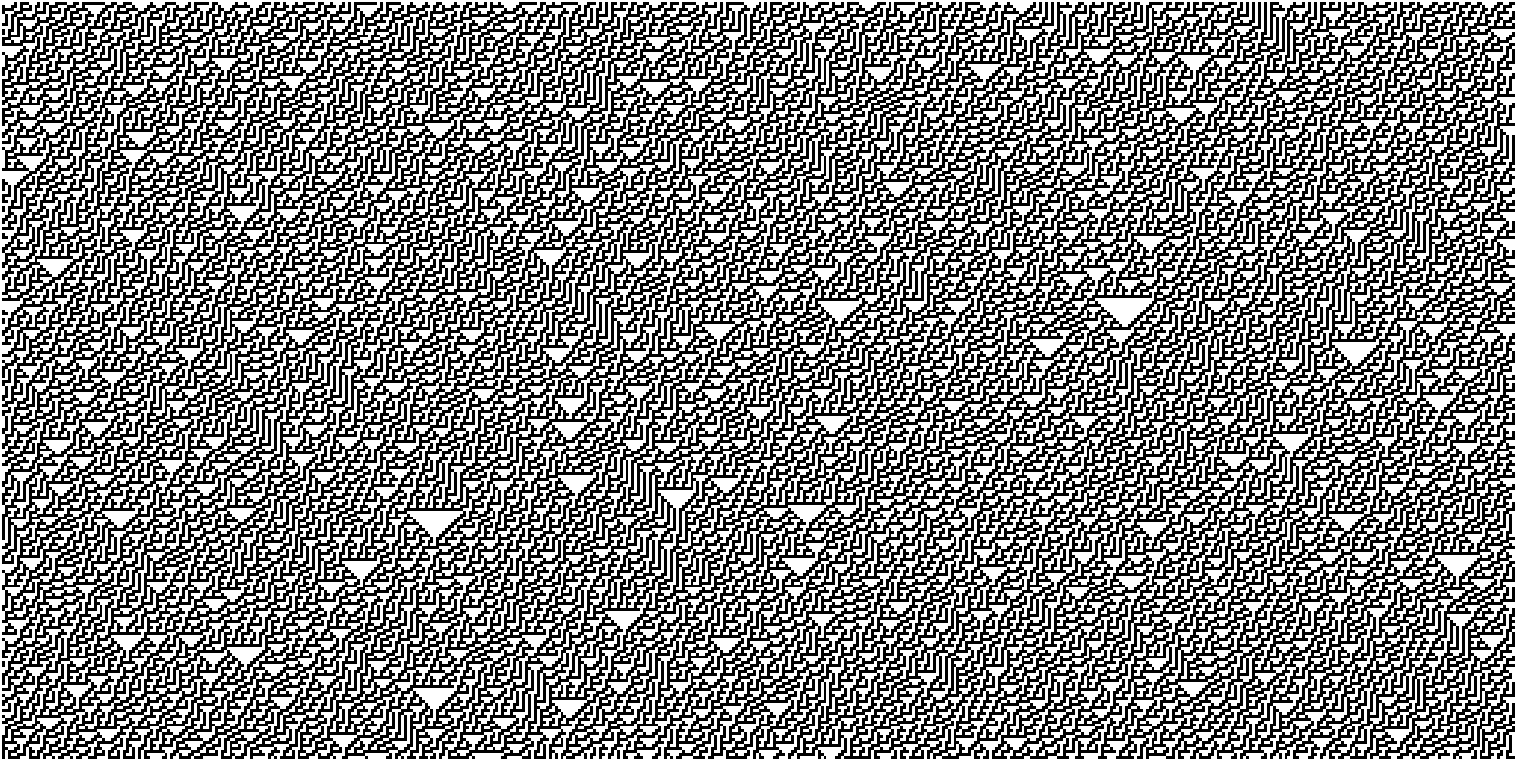


Figure 1: Rule 30 evolution

Seed-Density	Fill	Length	Steps
50		512	256

Table 1: Simulation data

1 Phenotypic Analysis

1.1 Density

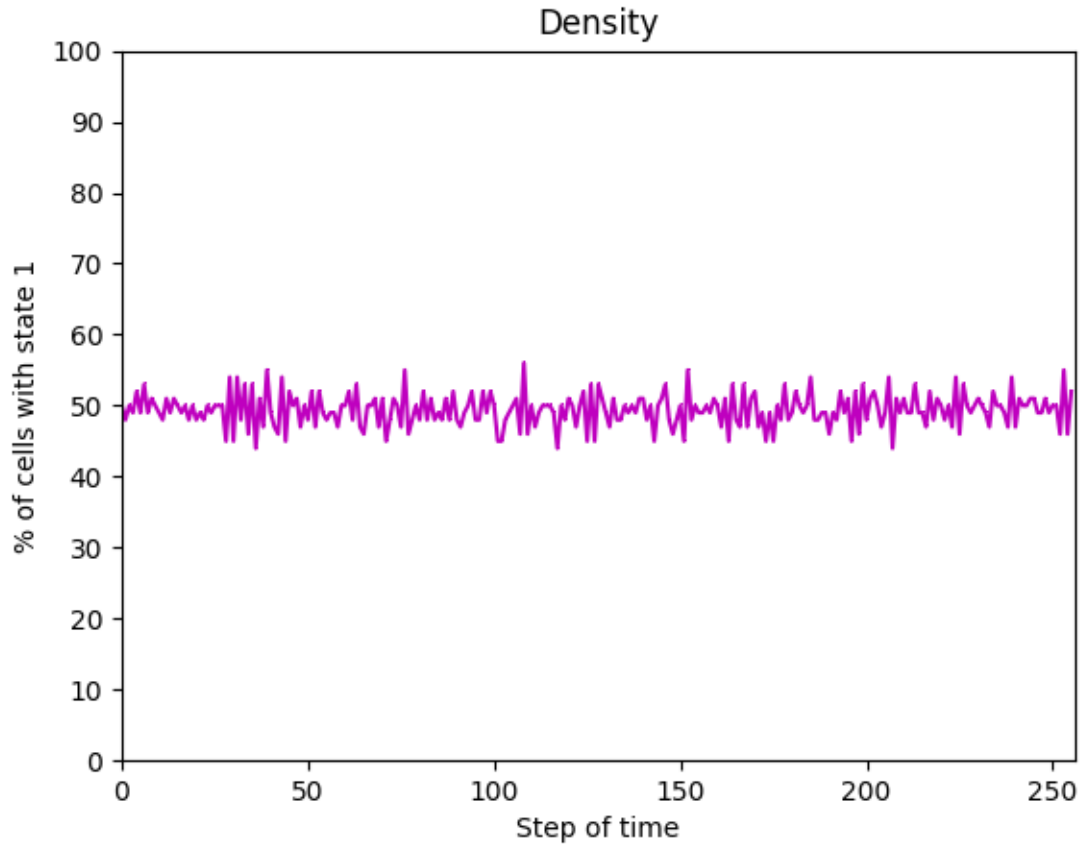


Figure 2: Density plot

Density plot shows the percentage of cells with state 1 along every step of time in the simulation

1.2 Entropy

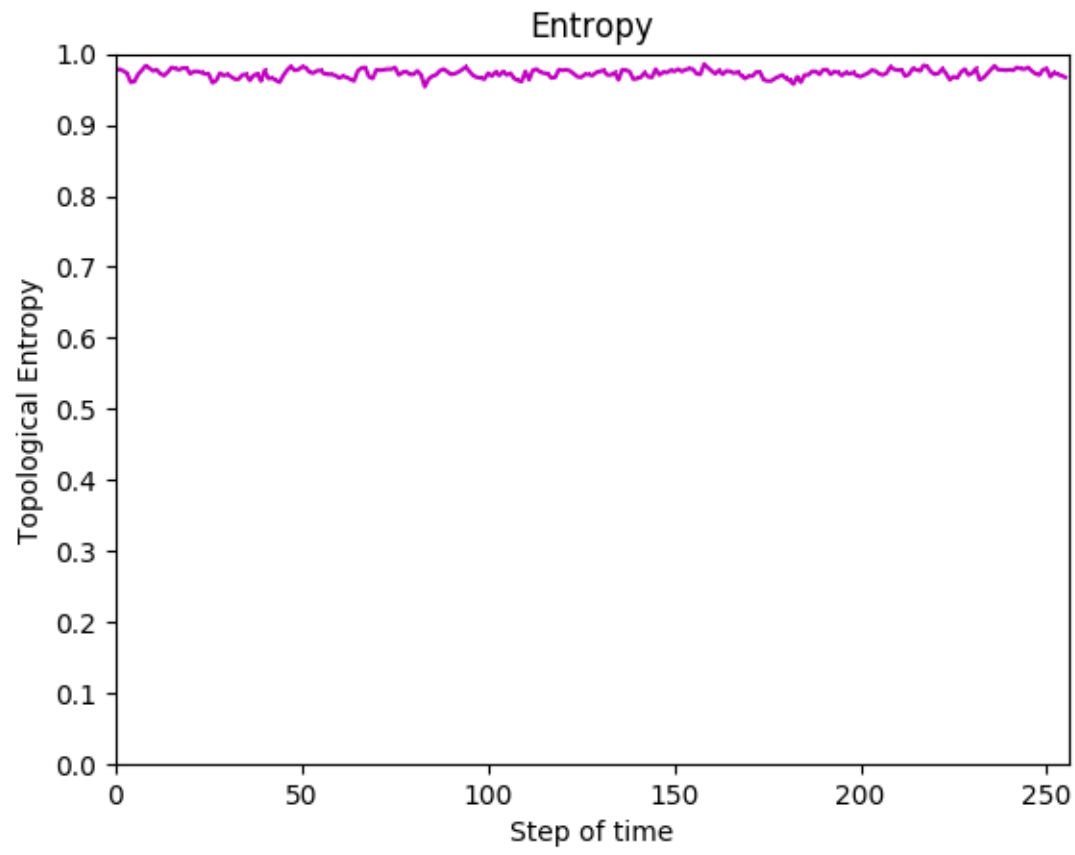


Figure 3: Entropy plot

Entropy plot shows the information in the system along every step of time in the simulation, the more information higher the entropy and the system can be considered more chaotic

1.3 Lyapunov exponents

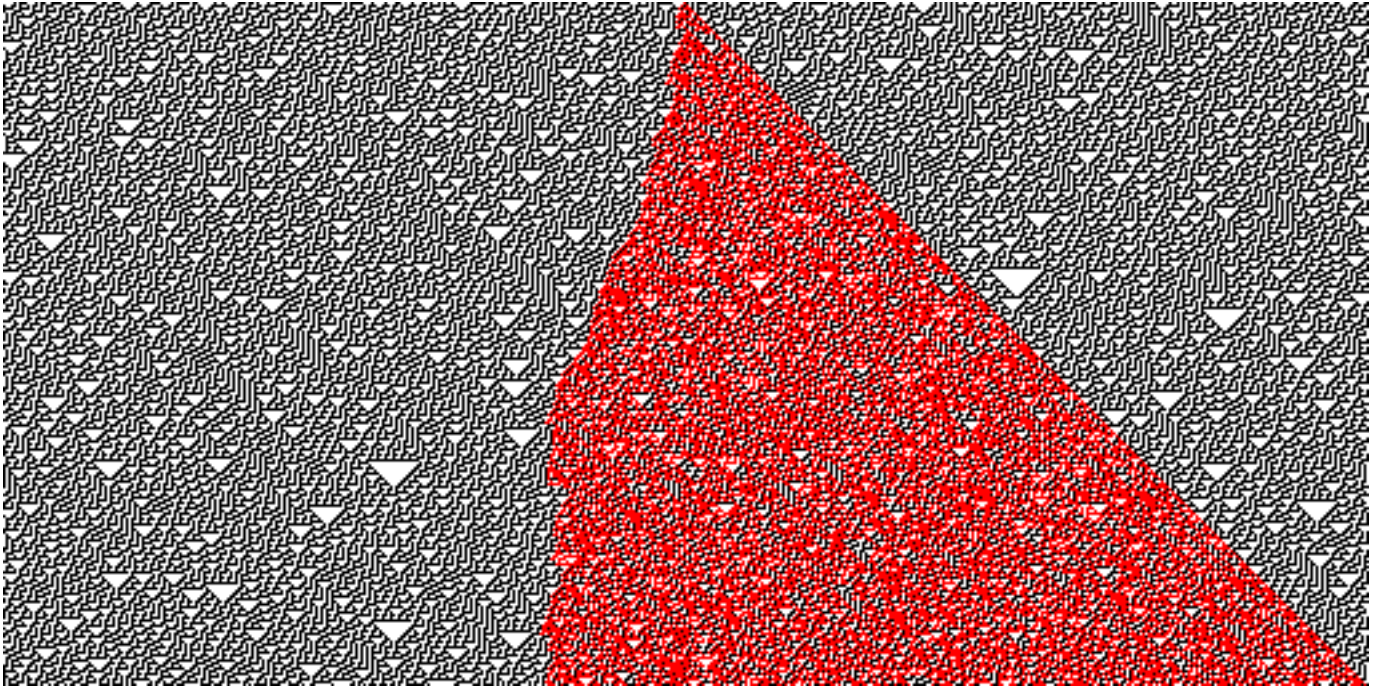


Figure 4: Damage spreading

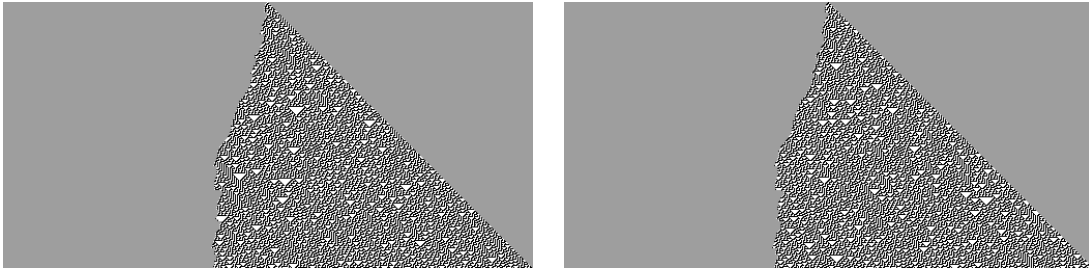


Table 2: Original simulation and Altered simulation comparison

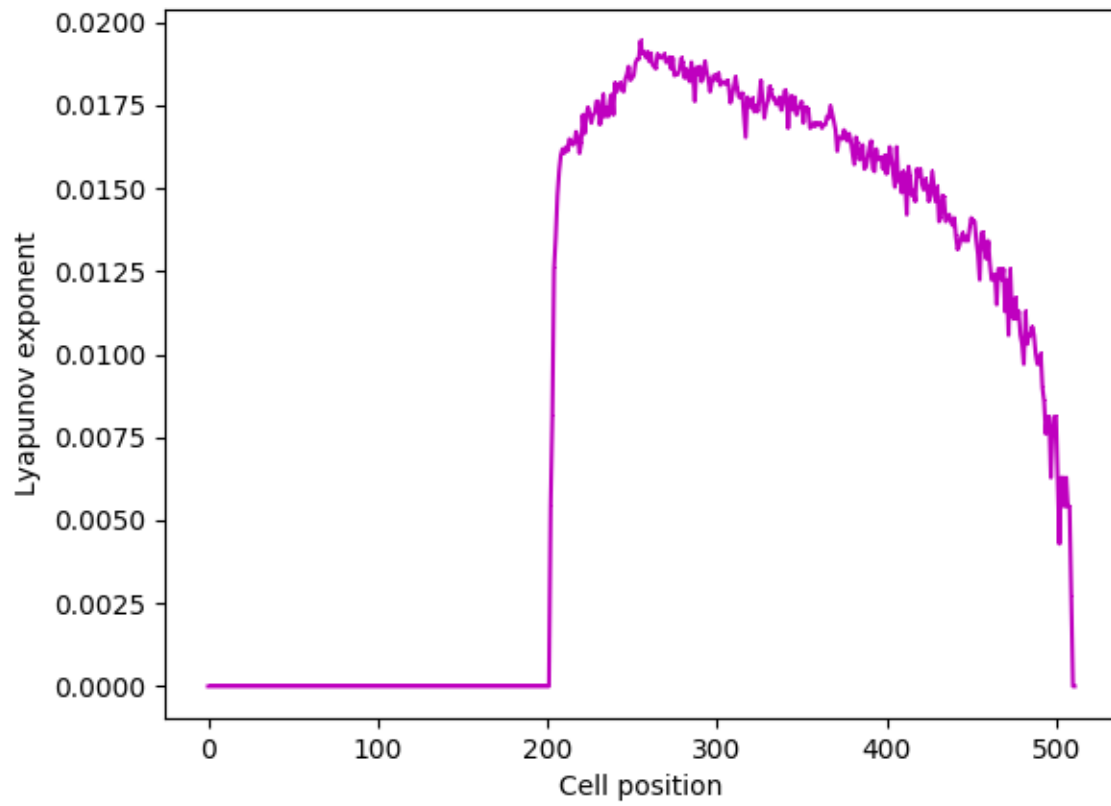


Figure 5: Lyapunov profile

The Lyapunov analysis shows the time-averaged expansions rates in each possible direction of a single defect introduced in the initial configuration.