Review of: "Self-Replication, Spontaneous Mutations, and Exponential Genetic Drift in Neural Cellular Automata"

Riko Safaric[1]

1 University of Maribor

II am not a specialist in the Artificial Life (AI) topics. I prefer working with genetic algorithms. But I did understand the basic issue, that the balance of convergence in NCA and divergence is essential for the new generation children to produce the genetic drift for an AI. I believe I correctly understand the all basic scenarios: seed-> the full grown adult -> producing the egg (or seed) -> growing the new child etc. My question is regarding the next paragraph in the paper in the beginning of section Calculating the genetic drift:

"This model has no alleles or chromosomes in the DNA representation, so our definition of genetic drift is different from the biological definition. We define genetic drift as the accumulation of neutral mutations in the genetic code through successive generations. In the absence of selection, all mutations in the model are neutral, except from the rare mutations that prevent an organism from replicating; the possibility of these mutations is largely eliminated during training and therefore rare after convergence of the model."

If I understand correctly, the genetic code is accumulating the changes due to the mutation, which is the source of the divergence or genetic drift. I am missing the information in the paper what is this "genetic code", how it is generated in the "egg" and how the genetic code is mutated?

Bye the way, I enjoyed reading the paper, and I learned a lot of new information about AI from it.