vasilvas99/LeniaCUPY: Lenia implemented in python with cupy
https://github.com/vasilvas99/LeniaCUPY

erwanplantec/FlowLenia
https://github.com/erwanplantec/FlowLenia

[2212.07906] Flow Lenia: Mass conservation for the study of virtual creatures in continuous cellular automata
https://arxiv.org/abs/2212.07906

Arithmetic-Lenia/reports/pics at main · SamCabV/Arithmetic-Lenia
https://github.com/SamCabV/Arithmetic-Lenia

lenia-lh/Kernel.py at main · ljhowell/lenia-lh
https://github.com/ljhowell/lenia-lh/blob/main/Kernel.py

Lenia is a family of cellular automata (CA) generalizing Conway's Game of Life to continuous space, time and states. Lenia has attracted a lot of attention because of the wide diversity of self-organizing patterns it can generate. Among those, some spatially localized patterns (SLPs) resemble life-like artificial creatures. However, those creatures are found in only a small subspace of the Lenia parameter space and are not trivial to discover, necessitating advanced search algorithms. We hypothesize that adding a mass conservation constraint could facilitate the emergence of SLPs. We propose here an extension of the Lenia model, called Flow Lenia, which enables mass conservation. We show a few observations demonstrating its effectiveness in generating SLPs with complex behaviors. Furthermore, we show how Flow Lenia enables the integration of the parameters of the CA update rules within the CA dynamics, making them dynamic and localized. This allows for multi-species simulations, with locally coherent update rules that define properties of the emerging creatures, and that can be mixed with neighbouring rules. We argue that this paves the way for the intrinsic evolution of self-organized artificial life forms within continuous CAs.