

List of the Turing-complete totalistic life-like CA

[Post Reply](#) 

Search this topic...




81 posts

[1](#)[2](#)[3](#)[4](#)[>](#)

Naszvadi



List of the Turing-complete totalistic life-like CA

 December 4th, 2016, 4:00 pm

This topic is for collecting all 2D life-like totalistic cellular automata that are **proven** to be Turing-complete, with link to/summary of the **first AND the simplest** proof of its Turing-completeness...*

...or with embedding a Wolfram 110 automata, showing at least that the automata is capable to perform all **finite** computations - the purpose is: mostly all logic element implementations usually lack precisity, e.g. correct timing, discussing correctly the connectivity of elements etc.

Game of Life (citation needed, with oldest existence and simplest constructed UTM) Others?

What I prefer:

- Would be handy including constructions of unit cells that emulates GoL, Rule-110 or other relevant rules, and wonder if there are such unit cells that work in other rules
- If there is at least one \$SUBJECT CA that is TC, then it can be embedded into Life using [OTCA-metapixel](#)
- An up-to-date wiki entry with the corresponding rules

Currently known Turing-complete rules that support the Glider and some other [life-like](#) rules inspected by [David Eppstein](#), Dean Hickerson et al:

1. B3/S23
2. B3/S236
3. B3/S2367
4. B3/S23678
5. B3/S2368
6. B3/S237
7. B3/S2378
8. B3/S238
9. B36/S23
10. B36/S237
11. B36/S2378
12. B36/S238
13. B368/S23
14. B368/S238
15. B37/S23
16. B37/S236
17. B37/S237

18. B37/S238
19. **B378/S23** (2020.09.21.)
20. B378/S237
21. B378/S2378
22. B378/S238
23. B38/S23
24. B38/S236
25. B38/S2367
26. B38/S23678
27. B38/S2368
28. B38/S237
29. B38/S2378
30. B38/S238
31. **B35/S236**
32. **B368/S12578** (2020.07.11.)
33. **B3678/S34678** a.k.a. [Day and Night](#) (2020.08.14.)
34. **B36/S245** the "Logarithmic replicator rule" (2020.08.19.)
35. **B368/S245** as [Move](#) by [Layz Boi](#) (2020.08.20.)

Last updated on: 2020.09.24.

So for now, all "classic" "B3*/*" life-like rules without supporting the [glider](#), and has at least one constructed glider gun is known to be Turing-complete*

Except that B35/S236's P68 glider gun works in B358/S236 too!

Many rediscovered B0 life-like rules usually contain plenty of constructed glider guns and as a corollary - more or less plausible or even trivial constructing glider circuits, logic gates etc.

Last edited by [Naszvadi](#) on September 24th, 2020, 1:32 pm, edited 7 times in total.

Naszvadi



Re: List of the Turing-complete totalistic life-like CA

December 8th, 2016, 6:04 pm

B3/S23 (Game of Life): A unit cell of Rule-110 automaton was created, visit for more:

[http://pentadecathlon.com/lifenews/2005 ... _cell.html](http://pentadecathlon.com/lifenews/2005..._cell.html)

Naszvadi



Re: List of the Turing-complete totalistic life-like CA

December 9th, 2016, 6:51 pm

“ Naszvadi wrote:

B3/S23 (Game of Life): A unit cell of Rule-110 automaton was created, visit for more:

[http://pentadecathlon.com/lifenews/2005 ... _cell.html](http://pentadecathlon.com/lifenews/2005..._cell.html)

The above unit cell works in B3/S238, too, and in the non-totalistic B3/S234c and B3/S236e rules.

So, EightLife is Turing-complete - proven since 2016.12.09