

Conway's Game Of Life

What is it?!

a zero-player game

meaning that its evolution
is determined by its
initial state, requiring
no further input.

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the “board”

an infinite 2 dimensional
grid, where each each cell
of the grid is either
“alive” or “dead”

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the rules

- Every cell interacts with its eight neighbours, which are the cells that are horizontally, vertically, or diagonally adjacent.
- Each “turn” the following transitions occur:
 - Underpopulation: If a live cell has fewer than two live neighbors, it dies.
 - Overpopulation: If a live cell has more than three live neighbors, it dies.
 - Reproduction: If a dead cell has exactly three live neighbors, it becomes a live cell.

That's it!

What's the big deal
then?!

cellular automata

is a discrete model
studied in computer
science, mathematics,
physics, etc.

Cellular automata can
simulate a variety of
real-world systems,
including biological and
chemical ones.

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undecidable

aka the halting problem

Is there an algorithm,
that given an "initial"
pattern and a "later"
pattern, can tell whether,
starting with the initial
pattern, the later pattern
is ever going to appear?

Nope!

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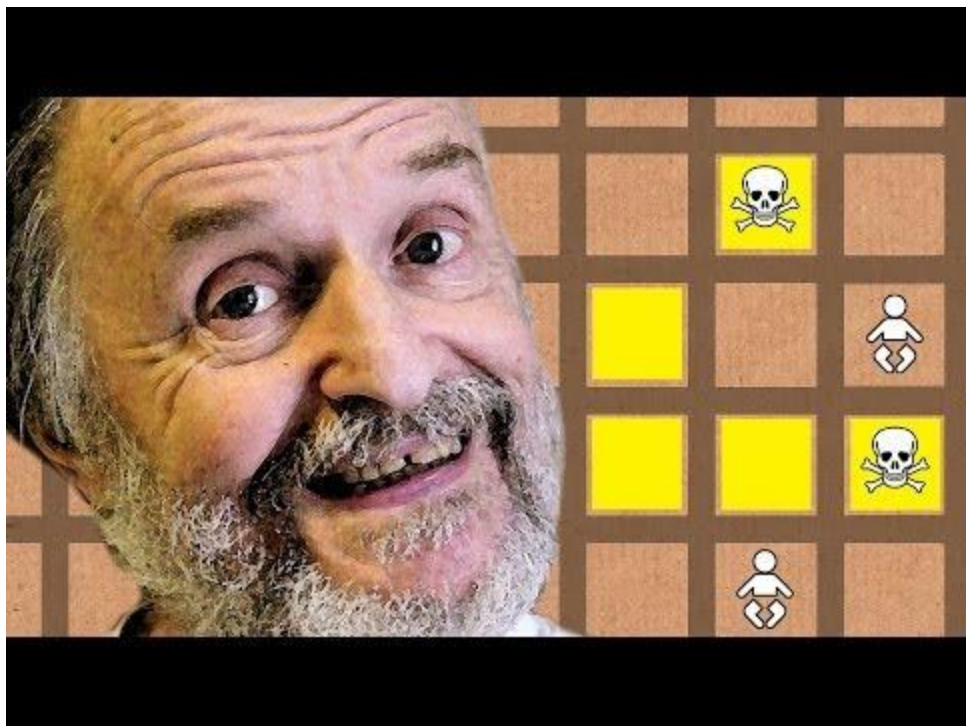
universal

aka Turing complete

anything that can be
computed algorithmically
can be computed within
Conway's Game of Life.

What about outside of academia?

- it's fun to watch
 - “Ever since its publication, Conway's Game of Life has attracted much interest, because of the surprising ways in which the patterns can evolve.”
- it was in the right place at the right time
 - The popularity of Conway's Game of Life was helped by its coming into being just in time for a new generation of inexpensive computer access which was being released into the market. ... For many, Life was simply a programming challenge: a fun way to use otherwise wasted CPU cycles. For some, however, Life had more philosophical connotations. It developed a cult following through the 1970s and beyond...



references

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- [Conway's Game of Life](#)
- [cellular automation](#)
- [adafruit source code](#)