

# **Conway's Game of *Social* Life**

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**Video:** [https://www.youtube.com/watch?v=kF-OIEB7\\_1I](https://www.youtube.com/watch?v=kF-OIEB7_1I)

## **Brief Overview**

What is the problem you are addressing? In broad terms, how do you plan to address it? What are your goals for the project?

Our project is a version of the classic Conway's Game of Life, which will allow the user to view his or her social history visually in the game. Conway's Game of Life is a cellular automaton, devised by British mathematician John Horton Conway in 1970. The game is a zero-player game, which relies on an initial configuration. Cells are either alive or dead and every cell interacts with its eight neighbors. Our version of the game will set these initial configurations for a user based on the user's web browser history. Specifically, within the user's web browser history, the game pays attention to the user's visits to social media websites (facebook, twitter, etc). Based on the number of profiles visited within each site, a different configuration will be set for that particular user's history. The game will be visualized graphically. Users will be able to interact with their social website history in a different and new way.

The goals of our project include creating a version of Conway's Game of Life. We also aim to create a search algorithm that will comb through a user's search history. And we must create an algorithm that will translate the search history information into initial configurations for Conway's Game of Life. Finally, another goal we want to accomplish is to create a visualization of Conway's Game of Life that we feel will optimize user experience.

## **Feature List**

### **Core Features:**

- Graphic interface for Conway's Game of Life
- Interpretation of User's Web Browser History
- Search Algorithm that will isolate social media websites from user's web browser history
- Algorithm that will translate number of visits to social media websites into initial configurations for Conway's Game of Life
- User Interface to Submit their Information and play the game

### Cool Extensions:

- Expansion of Number of Social Media Websites
- Create more outlets for the translation algorithm from information to initial configurations
- Influence Conway's Game of Life as it is being run with new user input
- Create cool graphics to accompany the game (i.e. color, shapes, changing colors/sizes)
- Consider time spent on a website or number of profiles visited as a variable to influence the game algorithm of configuration initialization or search

### Technical Specification

The project will be coded in Ocaml using the graphics module. There will be two main parts:

1. The first involves looking at how much the user uses social media, and have that set the parameters for the game of life. We will receive the user's web history and parse through it, looking for social networks. It will match the urls with social networks and keep track of the total number of websites and the number of social website. It will thus return the percentage of websites visited that are social networks. Depending on which social outlet the user visits the most, we will be able to determine the parameters for the game. For example, if an individual goes on Facebook the most, then he will have a particular set up for the game, while Instagram would have something different. This function also runs an algorithm to set the initial live cells. These would also vary by social media activity. If you're being very social, the points would be spread evenly. Less social, the points might be more clustered, simulating closed off communities. This function feeds the parameters into a recursive function that actually runs the game.
2. The second part of the program is the one that creates the game of life. This one will have two subparts:
  - a. The first part actually "plays" the game. It's tail recursive so as to not run out of stack space. Based on the parameters we determined from the previous steps, the game of life will continue to run. We're not actually sure how to implement the game yet. We have though of a few options. One possibility is to feed in an excel csv file and read the grid from there. The function could read neighboring cells and update the game. Another possibility is to use either arrays to simulate the rows of cells. We don't think it's possible to use lists because they are not mutable. This link [outlines the Game of Life algorithm that we will be using and has example](#)

implementation:

[http://rosettacode.org/wiki/Conway's\\_Game\\_of\\_Life#OCaml](http://rosettacode.org/wiki/Conway's_Game_of_Life#OCaml)

- b. The other part using the OCaml Graphics module to create the scene. Because the OCaml Graphics module “paints over” the last screen when it is updated, the graphics function does not need to keep track of the game, only be fed the new grid to display. Therefore, as neighbors appear and die off, the grid will continue to replace itself.

There are going to be two algorithms applied in our project. The first is going to be the one that parses through the history and determines the social media outlet visited the most. The second is going to be the conversion of that data into the parameters for the game of life.

In order to break this project up into modular tasks for each member, we have decided that the boys will take over setting the initial formation of the board and dealing with the OCaml graphics while the girls will figure out how to read in user browser history, analyze it, and then set life/death/survival parameters based on that analysis. We believe that this breakdown will allow everyone to get a good understanding of the algorithms being used, but will let the work be done efficiently.

### **Next Steps**

Our “next steps” may be broken up into three main parts: programming environment, project design, and predicted challenges.

1. Programming environment: We will be solely coding in OCaml and heavily relying on the OCaml graphics tool to create a visual representation of our representation of the game of life. Thankfully we do not need to get any new environments set up, but we will need to get more comfortable using OCaml graphics in general.  
The harder portion of this next steps task will require us to figure out how to input a user’s browser history into our code. In order to create the “social” aspect of our project viable, we will need to be able to read in, analyze, and act upon the data given to us by a user. Our current idea is to have a user’s history be stored in a CSV file and then have OCaml read/parse through that file.
2. Project Design: This is the creative part of our project. We have a lot of options in how we will design the initial state of our world and in how we will design the life/death parameters. We will first want to get a functional version of the Game of Life working based on the parameters set up by John Conway. However, this is the very base goal of our project. We will then need to understand how to manipulate our the start (grid size, location of the first “life” cells), life, survival, and death parameters, based on the input we receive from the user. Additionally, we will have to decide what user history data will be important to us when creating the parameters. Our ultimate goal is to show a person a

visual representation of their online social presence, and in this part of the “next steps” module we will be figuring out what it means for a person to be “digitally social” based on their browser data.

3. Predicted challenges: The actual algorithm for Game of Life is not difficult, yet creatively manipulating the parameters will be challenging. We need the visual representation to make sense to the user, and have a purpose. Creating a connection between the data and the visual representation will be tough, especially when creating the initial view.