CMSC 447

Software User Manual (SUM)

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1 Scope

This section shall be divided into the following paragraphs.

1.1 Identification

This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

Team Rocket's Game of Life, Team 3

Version 1, first release

Identifications:

Virus: Infectious system designed for gameplay interactions

Neighbor: The closest squares around the current square

Seed: Number used to generate pseudorandom board layouts

.exe: Windows OS executable program

1.2 System overview

The purpose of this software is to provide the user with an enhanced experience with Conway's Game of Life. This extension of the game adds features such as generating viruses along side living cells and seeing how each living cell and virus thrive or die together in each generation.

Team Rocket's Game of Life is sponsored by Ms. Dorothy Kirlew. This project is intended to be used by the public, and is currently being developed by Team Rocket. Currently, Team Rocket has no support agencies.

1.3 Document overview

This document shall detail the operation of all the features of the system, the system's environment, the interoperability of features, the error handling and valid user inputs, as well as the installation and setup for the software.

2 Referenced documents

This document does not reference other documents.

3 Software summary

This section shall be divided into the following paragraphs.

3.1 Software application

This software shall provide an enhanced experience of Conway's Game of Life.

3.2 Software inventory

As one of the requirements for this system it needs only the distributable .exe in order to operate on any Microsoft Windows operating system.

3.3 Software environment

This software shall require the following:

a. A desktop, laptop, or other computer capable of running the Windows operating system
b. Windows Vista, 7, 8, 8.1, or 10 operating system including the .NET framework.
c. A mouse with the ability to both left and right click.

3.4 Software organization and overview of operation

This paragraph shall provide a brief description of the organization and operation of the software from the user's point of view:

a. The rules for Conway's Game of Life are as follows:
   A cell with one or no neighbors dies
   A cell with more than four neighbors dies
   A cell with 2-3 neighbors lives
   A cell 3 neighbors becomes populated
   A virus populates one neighbor at a time
   A virus with no non-infected neighbors dies
   A virus infects one neighbor at random if it has more than one non-infected neighbor

b. Performance characteristics that can be expected by the user:
   1) The inputs for the user fillable fields all expect integer values and will handle erroneous input.
   2) The software will produce output at the rate the user defines with the slider when the continuous run mode is active ("Run" button changed to a "Pause" button). This can be as fast as 1 Hz.
   3) The board will be generated as quickly as 1 Hz. This is affected by the size of the board with larger boards responding more slowly than smaller ones.
   4) There are no know errors that can be seen in the following of the board rules.

3.5 Contingencies and alternate states and modes of operation

This software has a continuous run state which can be achieved by the user clicking the "Run" button and is indicated by the "Run" button becoming a "Pause" button. During this state the rest of the software's user interactions are still available though response times may be impaired.

3.6 Assistance and problem reporting

If the user needs further assistance support can be provided at the e-mail address: aflah1@umbc.edu

4 Access to the software

This section shall contain step-by-step procedures oriented to the first time/occasional user.

4.1 First-time user of the software

This paragraph shall be divided into the following subparagraphs.

4.1.1 Equipment familiarization

This paragraph shall describe the following as appropriate:

a. The software window will automatically resize to fit the user-defined dimensions of the board it contains. It will never be a width smaller than one that can accommodate the user controls.
b. The mouse right click shall be used for creating a virus on the board. All other user interactions can be accessed with the mouse's left click. The keyboard is only used for naming saved board states.

4.1.2 Installation and setup

In order to install the software the user only needs the software's .exe file. No additional setup is required.

4.2 Initiating a session

In order to initiate a session the user shall launch the software's .exe file.

4.3 Stopping and suspending a session

In order to stop a session the software can be simply closed using the "X" in the top right of the software window.

To suspend a session the user shall save the system state and then load it when they wish to resume.

5 Processing reference guide

This section shall provide the user with procedures for using the software.

5.1 Capabilities

The software Save and Load menus are interconnected. The Save menu will save the current software board state

5.2 Conventions

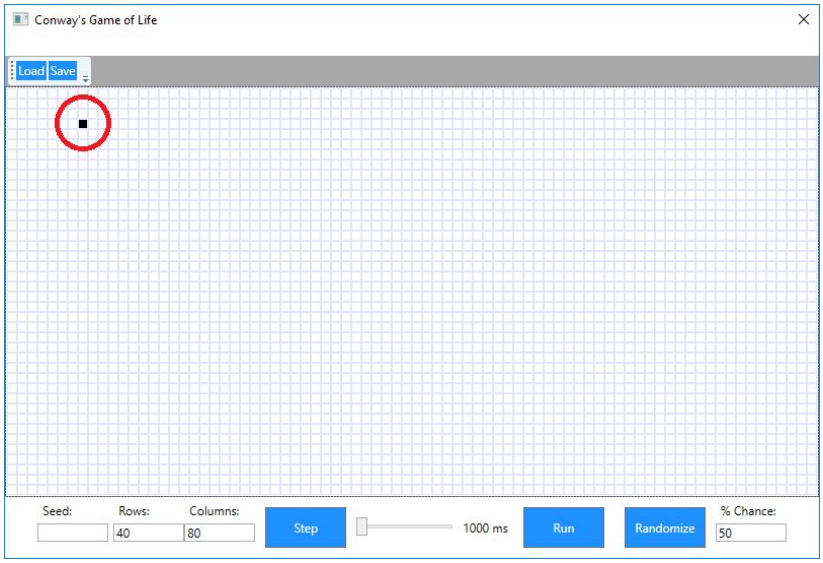
The software uses Microsoft's Explorer for file operations. The software also uses Microsoft's warning sounds for any handled errors.

5.3 Processing procedures

This paragraph shall explain the organization of subsequent paragraphs, e.g., by function, by menu, by screen. Any necessary order in which procedures must be accomplished shall be described.

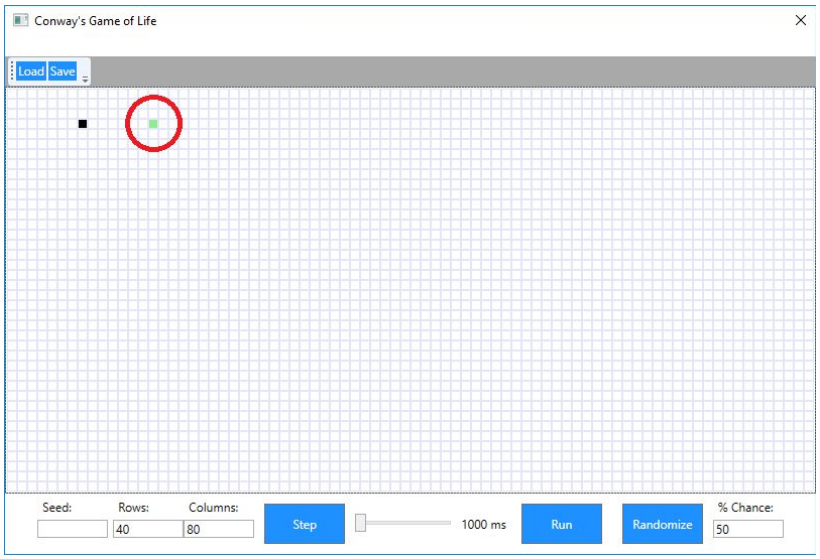
5.3.1 Creating Living Cells

To create a living cell, the user needs only to left click a cell or to left click and drag to create multiple cells.



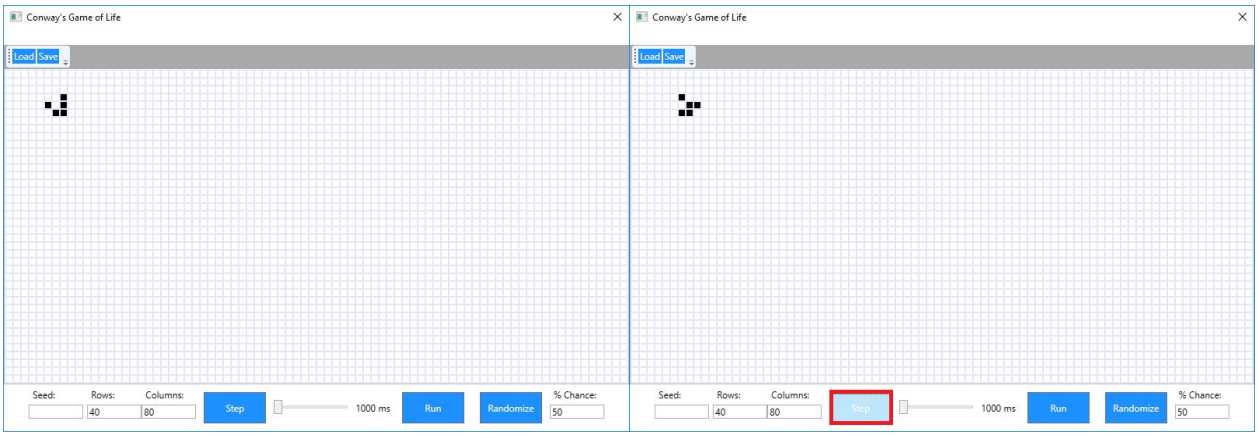
5.3.2 Creating Viruses

To create a virus the user need only to right click a cell



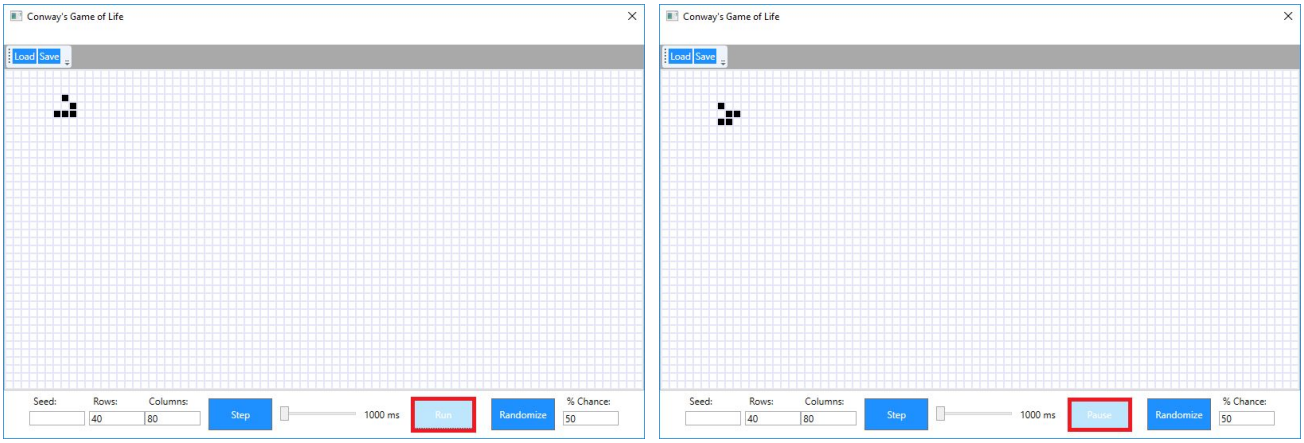
5.3.3 Step

In order to “step” once (apply the rules one time) the user can click the “Step” button found at the bottom of the software window:



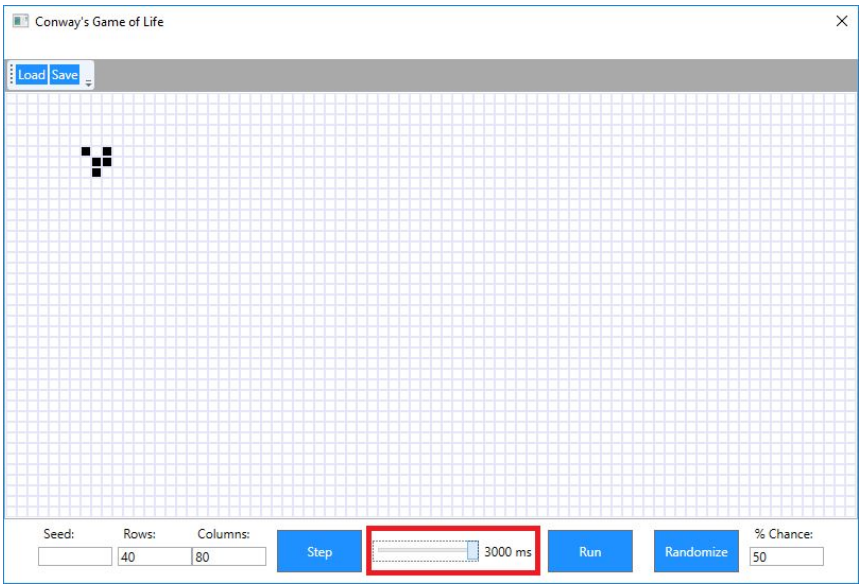
5.3.4 Run

In order to continuously step the user can click the “Run” button. This will apply the rules to the board at the interval detailed to the left of the “Run” button by the millisecond interval controlled by the slider. The “Run” button will change to a “Pause” button when toggled on to continuous run mode.



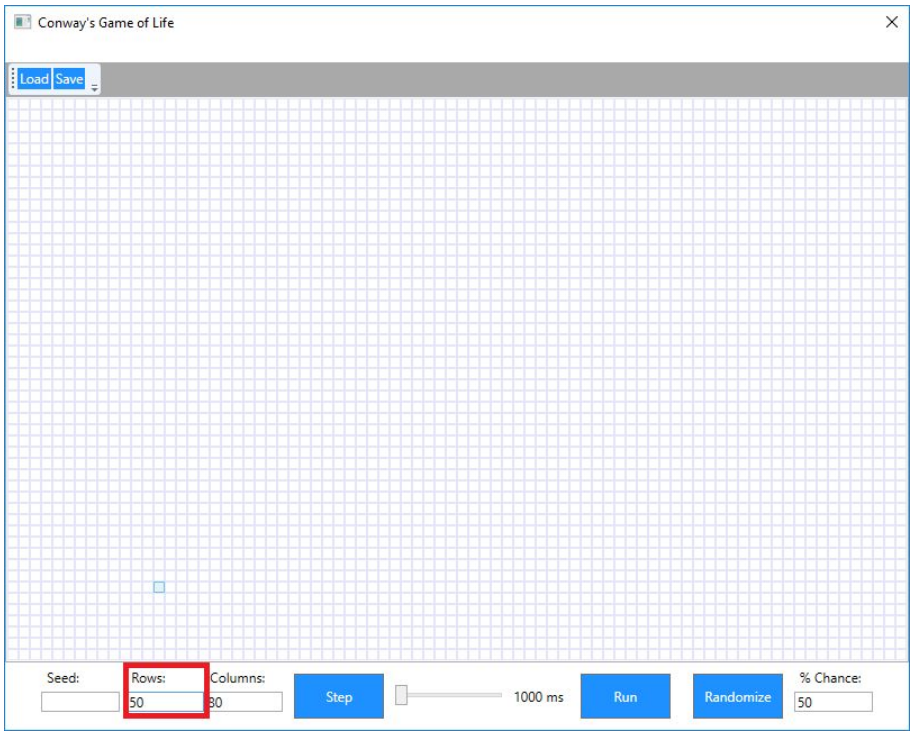
5.3.5 Change the Run Interval

The user can click and drag the slider to change the interval from 1,000 milliseconds to 3,000 milliseconds. This can be done in or out of continuous run mode.



5.3.6 Change Board Row Dimension

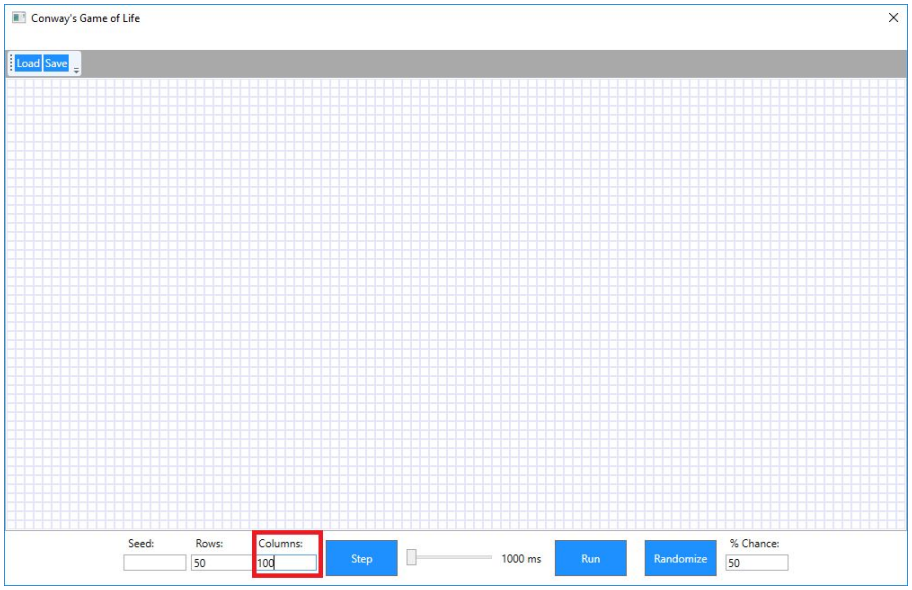
The user shall be able to enter a new number of board rows in the rows form at the bottom of the software window. After the user enters a number of rows the changes will take effect after they press enter. The row value must be between 10 - 60 and the user will be presented with an error for any invalid values.



5.3.7 Change Board Column Dimension

The user shall also be able to enter a number of columns in the same way as entering the number of rows as detailed in section 5.3.6 of this document. The valid range is 10

- 140 for the column value.



5.3.8 Generate a Random Board with Random Number Generator Seed

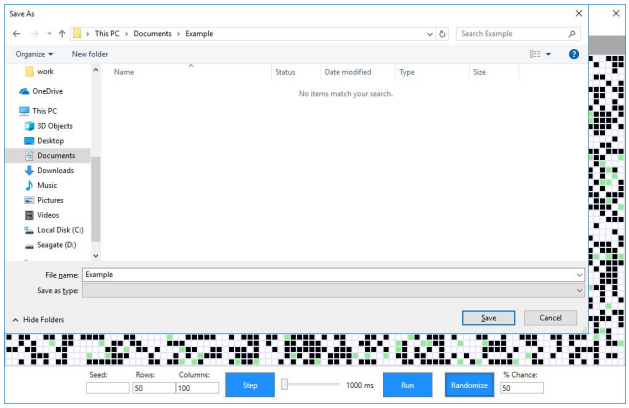
The user shall be able to enter a numerical “Seed” for a random number generator to fill the board. Once a value is entered a new board will be generated by pressing the enter key using the user provided seed value.

5.3.9 Generate a Random Board by Percentage

The user will be able to randomize the board with a user defined alive/virus percentage. The percentage can be 0 - 100 and the board will randomize once the user clicks the “Randomize” button. The percentage is split 9/10 Alive cells and 1/10 Virus cells. For example: a 50% chance will be a 45% chance of a cell being “Alive” and a 5% chance of a cell being a virus.

5.3.10 Save the Board State

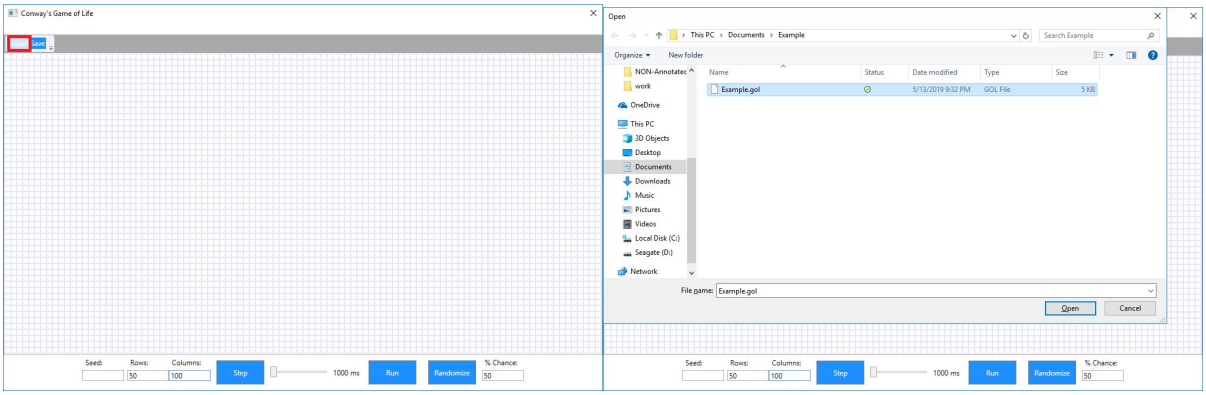
The user can save the system's state, including the board configuration, by clicking the "Save" button near the top of the software window. From there the Windows Explorer will prompt the user to enter a name which will be saved as a .gol file.



5.3.11 Load a Previously Saved State

The user shall be able to load any files they have saved in the manner described in

section 5.3.10 of this document. This action will load the state including the number of rows and columns that were saved as well as which cells were “Alive” or “Viruses”.



5.4 Related processing

All board operations are performed in the background.

5.5 Data backup

Board configurations can be saved with the save function detailed in section 5.3.10 of this document and loaded with the load function from section 5.3.11 of this document.

5.6 Recovery from errors, malfunctions, and emergencies

Erroneous inputs from the user in the randomize percentage field will be handled as they are typed; the field will only accept positive values. In the Rows and Columns fields of the software invalid inputs will cause an error popup detailing the range of valid values. Any number for the seed can be input and any non-number input will be ignored and cleared once the board is generated. If an invalid file format is loaded an error message will appear warning the user and no action will be taken.

5.7 Messages

When the user inputs an invalid row value the message received is: “Row value [input value] is out of range: 10-60.“

When the user inputs an invalid column value the message received is: “Row value [input value] is out of range: 10-140.“

If an invalid file format is loaded the error that is received is: “File load error: Corrupt or malformed file.”