Final Project

COMS 4995 Parallel Functional Programming

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Outline

- Overview
- Single-threaded implementation
- Multi-threaded implementation

Overview

Overview

- Simulate Conway Game of Life
- Dense representation
- Infinite grid

Overview

Coordinate System

- Coordinate: (X, Y)
- Equal number of cells on the left and right of the origin
- Width and height must be odd
- Grid implemented using hash map rather than list
    - We constantly need spatial information

Overview
IO

- Save space by only save living cells
- “`class Show`”

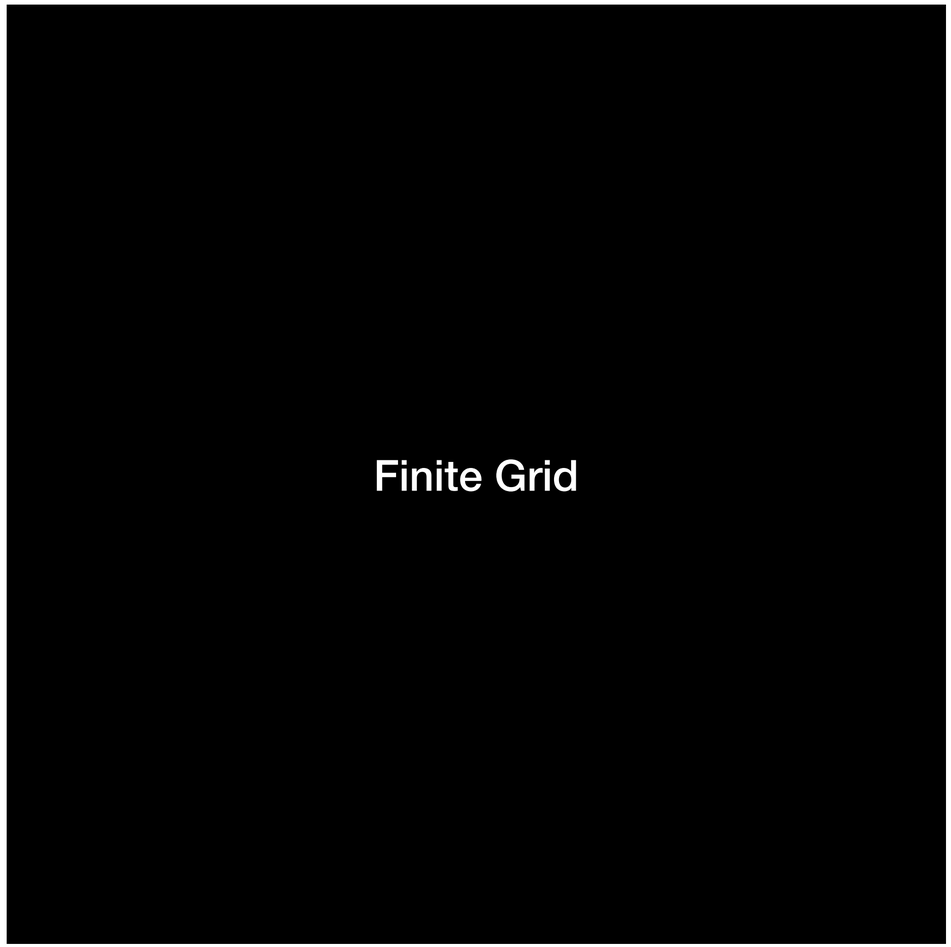
Source Code

- https://github.com/Zehua-Chen/conway-game-of-life

Single Threaded Implementation

Step 1
Finite Grid

- Simulate Conway Game of Life in a finite grid



Step 2

Grow the Finite Grid

- Grow the grid if needed

Step 2

Grow the Finite Grid

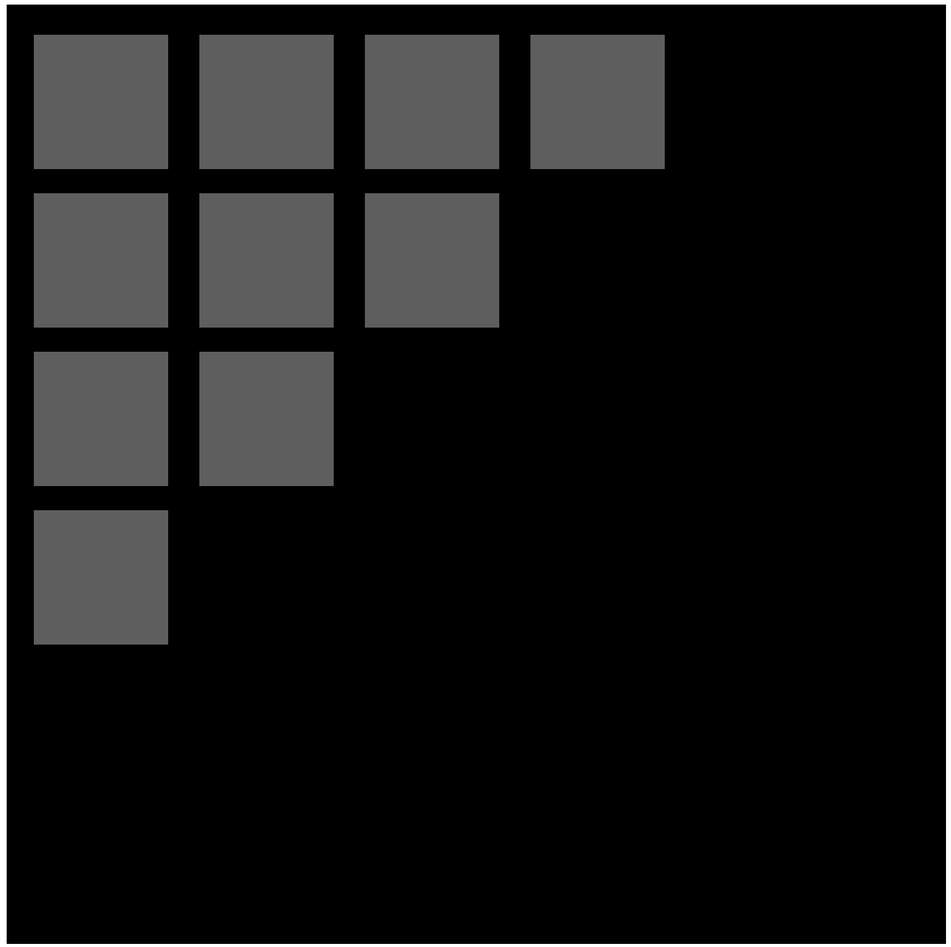
- Red corners does not need simulation, as they will never have 3 living neighbor

Multithreaded Implementation

Step 1

Simulate in Grid Slices

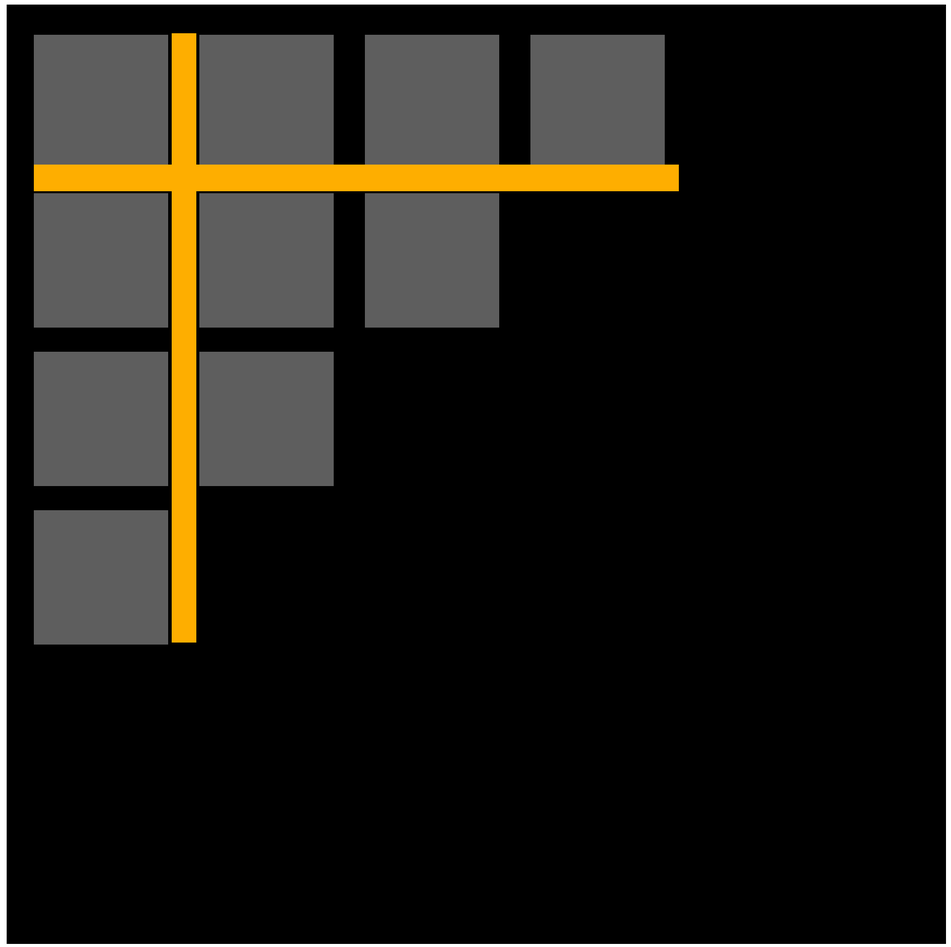
- Simulate Conway Game of Life in a slices of the grid



Step 2

Re-simulate Borders Between Slices

- Re-simulate the most outer layer, i.e. the border, of each slice



Step 3

Grow the Finite Grid

- Grow the grid if needed