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## 1 Automata Football

1. Good evening!
2. Hello, I am Stanley and this is my project, *automata football*.
3. What is *Automata Football*?
  - (a) A simple quick online game based around Conway's Game of Life
    - i. Conway is an important mathematician, he devised this
    - ii. It isn't really a game
    - iii. Conway's Game of Life is a cellular automaton
      - A. What is a cellular automaton
      - B. Similar to a turing machine or lambda calculus, as it can compute things
      - C. The computation is turning the cells on or off
      - D. An infinite grid of squares
      - E. squares (or cells) can either be on or off
      - F. Square rules:
      - G. If a cell has more than three neighbors lit up, it is off next turn
      - H. If a cell has less than 2 neighbors lit up, it is off next turn
      - I. If a cell has exactly 3 neighbors lit up, it is on next turn
      - J. If a cell has exactly 2 neighbors lit up and it is on, then it stays on next turn
      - K. People can make complex structures with this automaton
  - (b) The goal is simple:
    - i. Engineer automata by clicking on the cells
    - ii. Reach the opponent's end zone — Touchdown
    - iii. Secure your own end zone
    - iv. Every square that gets lit up in the opponent's endzone is a point for you
    - v. Four turns

- vi. Most points wins
- (c) Even though the goal is simple, the strategies have the capacity to be complex
  - i. Strategies stem from ambiguity
    - A. Can't see the opponent's side of the screen
    - B. Automata function
  - ii. Many different outcomes based on placement and and structure
- 4. Demonstration time
  - (a) Technical Details while demonstration is going
    - i. Server written as a node.js webapp
    - ii. Backend can run on Heroku
    - iii. Client written in ES6 JS (2015)
      - A. Practically everything is based on JS, CSS, and HTML
    - iv. Utilizes WebSockets for communication between the server and client
    - v. Uses interactive SVGs for graphics
- 5. Incomplete features
  - (a) Practice mode — play automata football by yourself, Conway's game of life
    - i. I can probably do it, I just need more time
  - (b) Time limits to turns — speed things up a bit
    - i. Requires a bit of communication through web sockets, and some computers are slower than others.
  - (c) Canvas client — Just in case the SVG doesn't support some systems