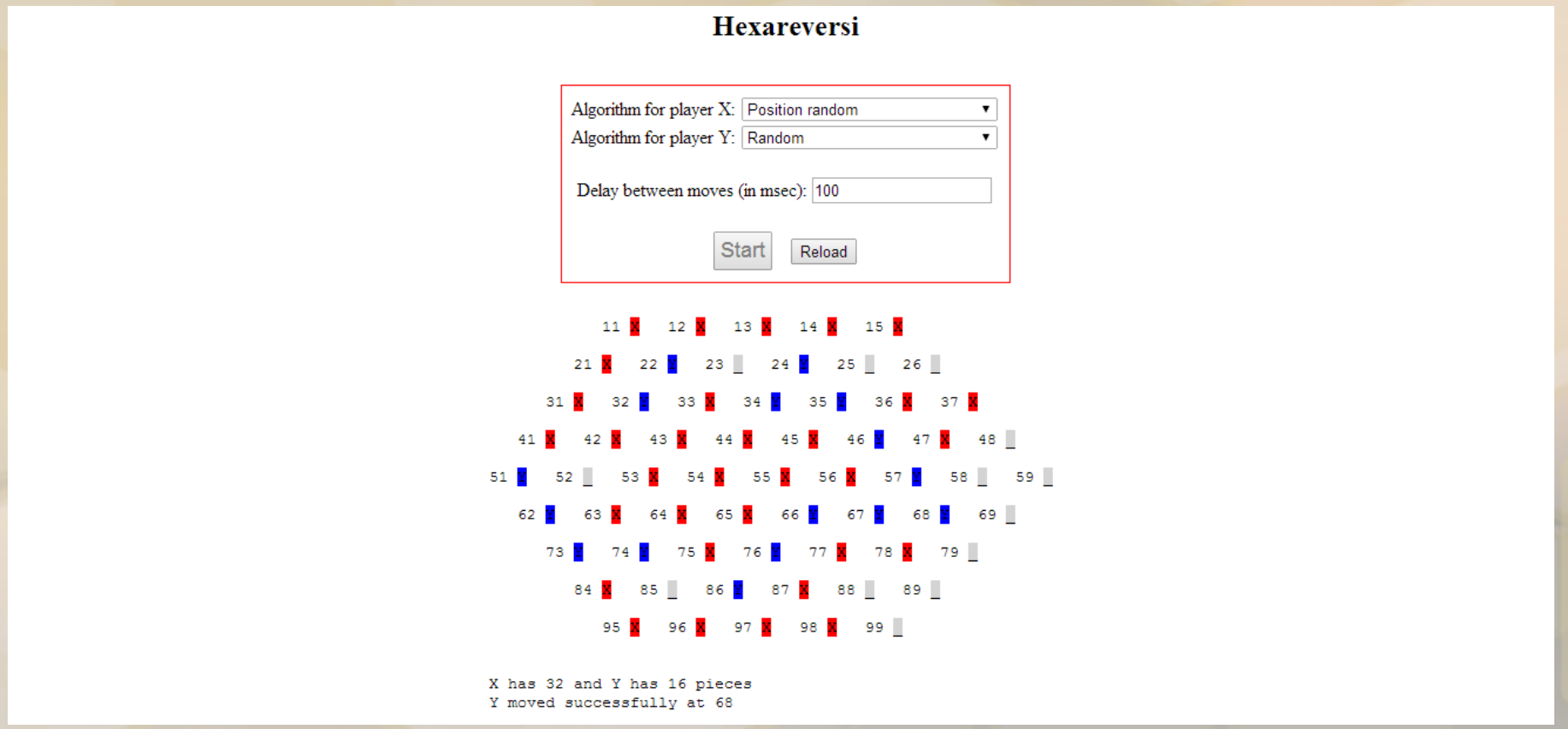
OTHEXO

An enhanced hexareversi game

Features & Improvement

- Improved Graphics & Animation
- Redesigned Webpage
- Tournament Mode
- AI – THEXI

Original Hexareveri



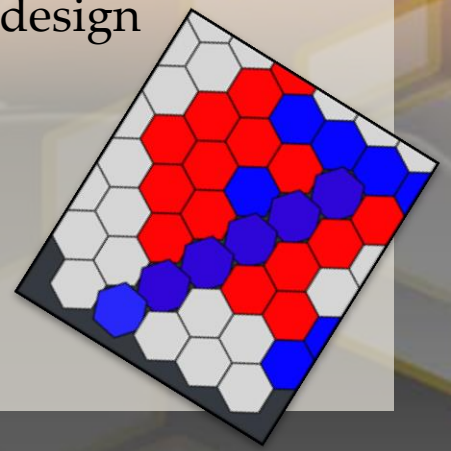
Graphics & Animation

- SVG drawn hexagon grid
  - SVG HTML5 design, lossless vector drawing
  - Size relative to client width & height
  - Each hexagon is an separate polygon, handled separately, stored in hexagonarr[]
  - The grid is only drawn once, colours updated using reDraw()
  - Drawn using svg.js library

Graphics & Animation

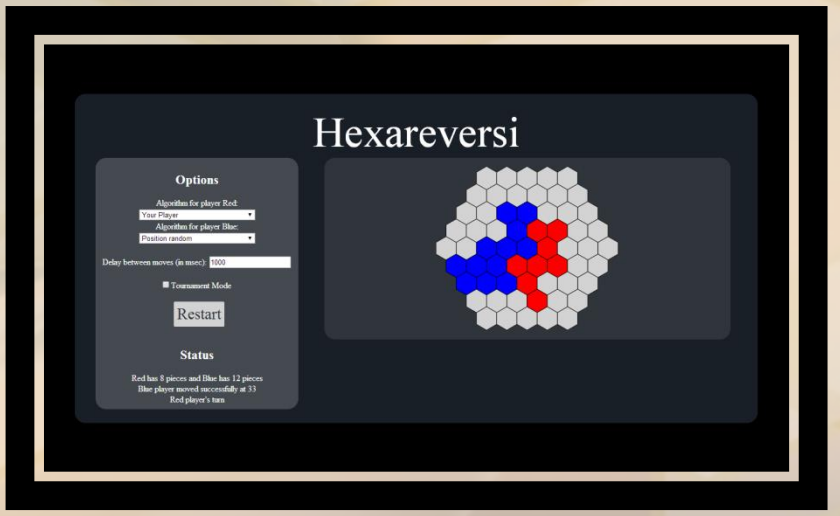
- Interactive hexagon grid

  - .mouseover() animations
    - Highlights hexagon cells with current player's colour
  - .click() events handled,
    - Cell clicked passed into "hidden + side" input as to preserve initial design
    - Checks that players are human and that it is their turn
  - Converted hexagon cell animation
    - Cell rotate and switch colours when they are changed



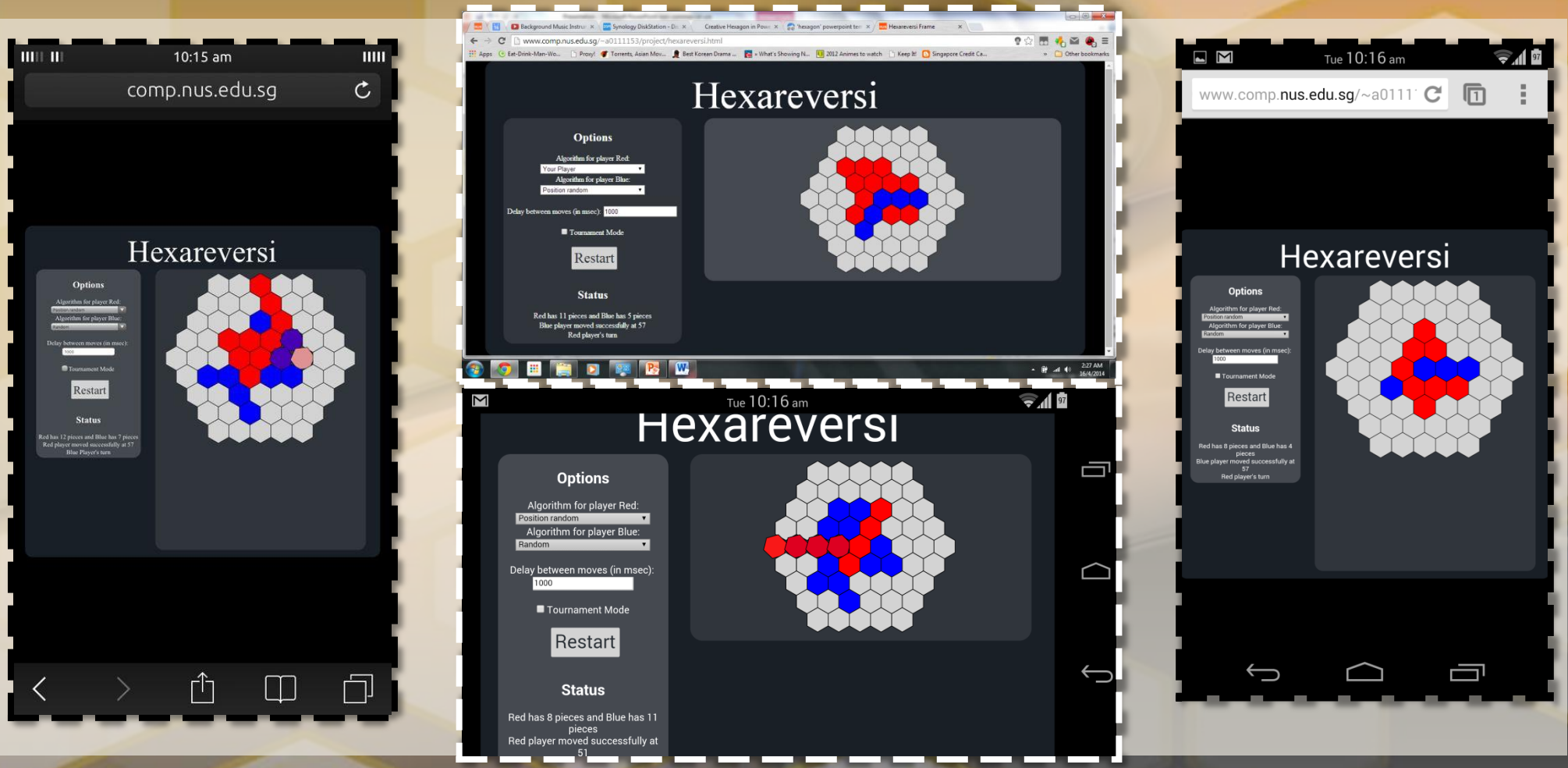
Redesigned Webpage

- Simple and intuitive user interface
  - Fluid and relative design, fits in one page,
  - Irrelevant options and grid hidden



- Compatible with modern PC and mobile browsers
  - Tested with Chrome, Safari, Firefox, IE 10, Android, IOS

Redesigned Webpage



Tournament Mode

- Simulate AI vs AI
  - On the fly updating of results
  - Restarts by recycling Game instance
    - Avoids drawing hexagon grid, update colours with reDraw()
  - Implemented inside of Game class, handled internally
    - Preserves initial setTimeout() design

AI - THEXI

- Functions:
  - predictMove(simboard, predarray, count, initcell, initscore, userorenemy)
    - Check for valid moves in simboard, recurses itself to predict enemy moves
      - Recursion depth (count) can be adjusted for THEXI's difficulty – Set at 2, balance between performance & difficulty
  - moveOnce(board, cellnum, userorenemy)
    - Stimulates piece put down at cellnum in board
    - Converts affect cells in board

AI - THEXI

- Functions:
  - countPieces(board)
    - Calculates net score from board (player – opponent pieces)
- Variables
  - simboard
    - Registers player piece as 1, opponent as -1
    - Ensures player can be red or blue
  - predarray
    - Stores the evaluated value of each hexagon cell
    - THEXI will pick the highest value cell

Outline of THEXI

countPieces() counts score, passes it to predictMove()

predictMove() passes each empty cell to moveOnce()

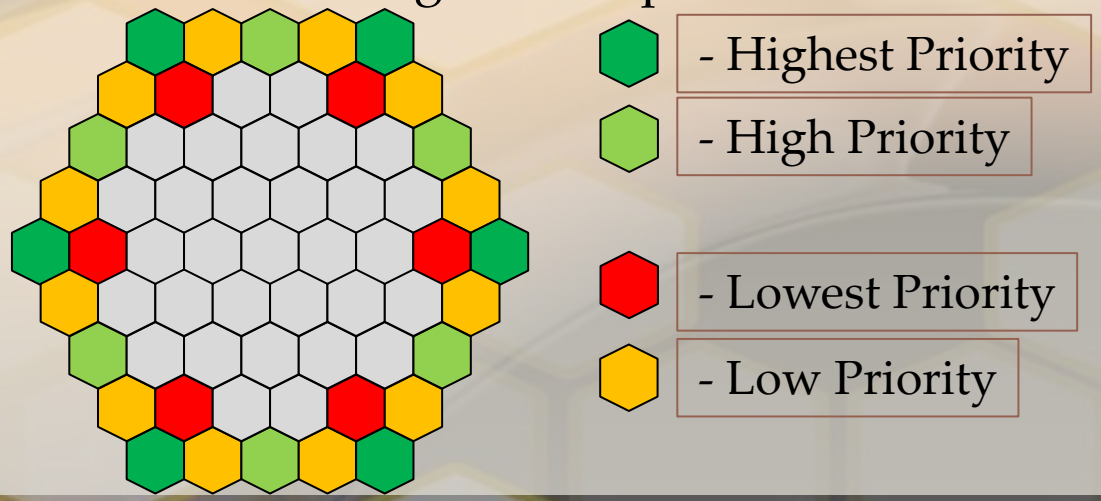
moveOnce() returns if it's a valid move, if so predictMove() recurses and switches side

predictMove() compares simulated score with intial score and modifies the value in predarray[init cell]

Cell with highest value in predarray[] is returned

AI - THEXI

- Additional conditions THEXI considers:
  - More value is added to cells where opponents are forced to passed, and score is advantages to us.
  - predarray[] values are modified according to their positions too



OTHEXO

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