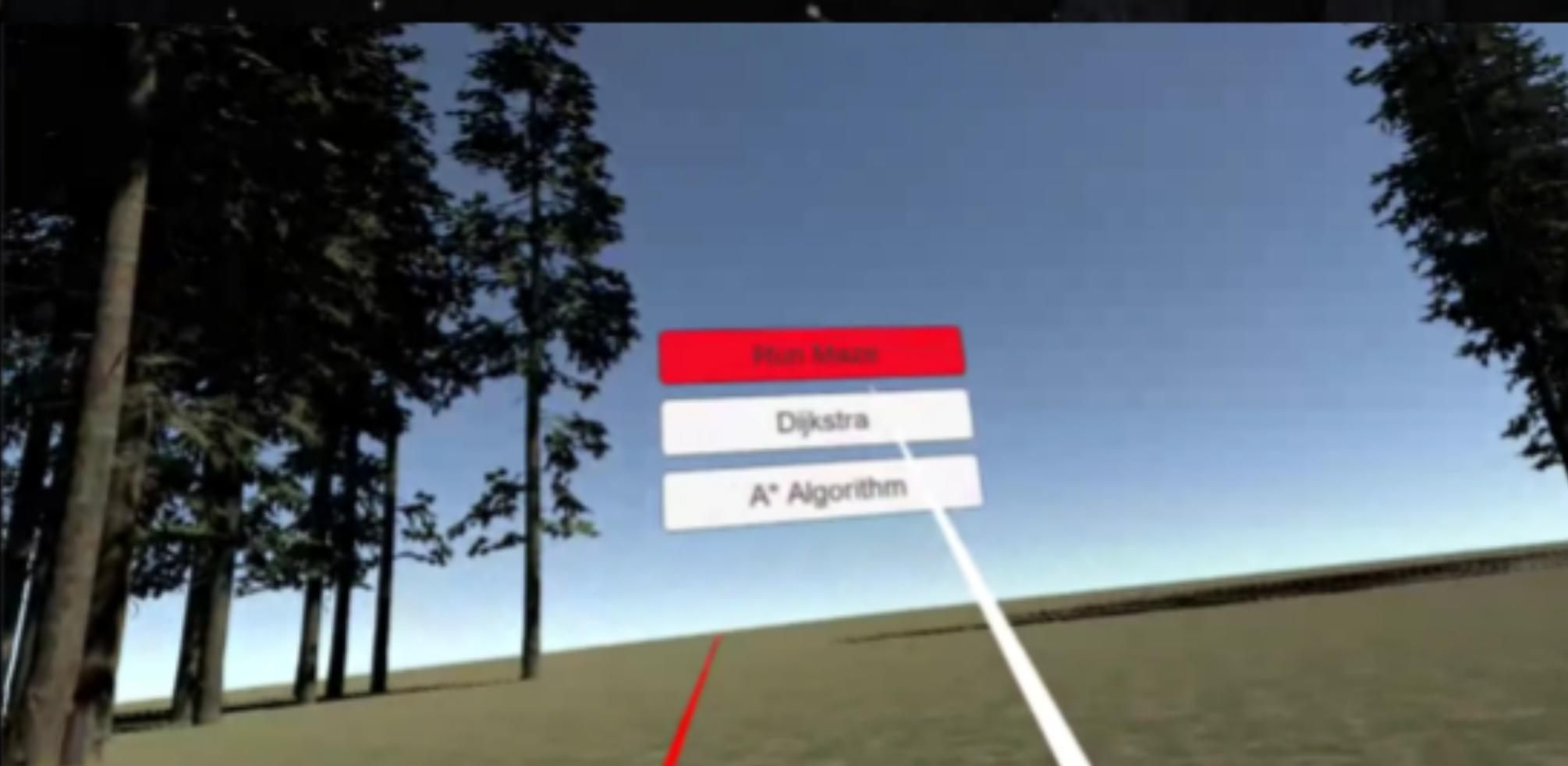


## VR Implementation

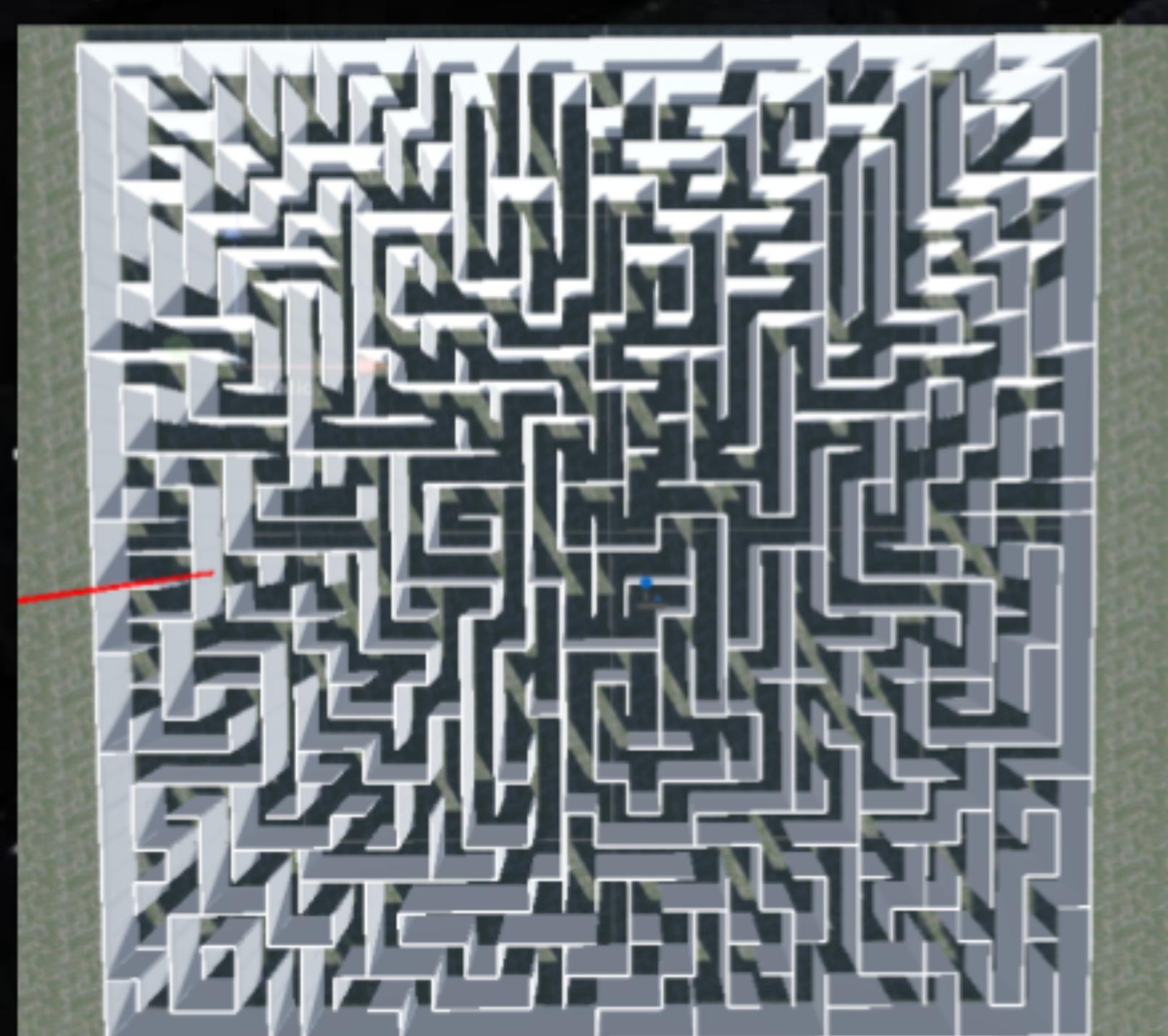
The VR implementation of AutoPath allows the user to pick the algorithm that they want and watch the algorithm solve a random generated maze. The user can fly around the map and see the most efficient path the algorithm generated.



The user will be able to choose the algorithm of their choice. They have the option of switching between the A\* and Dijkstra algorithm. Once they have chosen the algorithm of their choice a new random maze will generate every time "Run Maze" is clicked.



The new randomly generated maze will have a line rendering through the maze representing the algorithm solving it. Once the algorithm is done solving the maze, the user has the option of going into the maze and follow line as if it is a guide.



## What is AutoPath?

AutoPath is a web and VR-based application that visualizes pathfinding algorithms in real time. Users have the ability to choose from a randomly generated maze, maze presets, or simply build what they want. AutoPath allows users to choose from algorithms such as Dijkstra's Algorithm, A\* Search, Breadth-First Search, and Depth-First Search and visualize how the algorithm finds the path from a selected start point to a selected end point. Users are also allowed to create a custom maze in the web-application. Check out the website at [autopath.tigerenterprises.org](http://autopath.tigerenterprises.org) or scan the QR code on the right.



# AutoPath

## A Web and VR-Based Pathfinding Visualization Tool

### What We Learned

We primarily learned how algorithms such as BFS, DFS, A\*, and Dijkstra work to find a path between two given points. We also gained experience in deploying and Integrating the web application into a custom AWS Web Server using Apache2 and Node.JS. Finally, we learned about the core fundamentals of React and Unity XR library.

## Web Implementation



Scan to Visualize!

### Login and Registration

The AutoPath website allows the user to create an account or continue as a guest to access the pathfinding tool in the home page.

### Grid and Walls

Users will be presented with a 2D grid on the homepage with default start and end points already set. From there, users can set their own start/end points and click and drag the mouse over multiple grid cells to create walls that will prevent the chosen algorithm from searching through them.

### Maze Generation

Users will be able to select an option that automatically generates a maze for them. The maze generation can be visualized in real time.

### Algorithm Visualization

Users will be able to choose from a wide range of algorithms to start visualizing how a selected algorithm finds a path from a given start point to end point and highlight the most optimal path.