

A Graphics Project on

“3D” Maze

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What is “3D” Maze?

“3D” maze is an attempt to model a maze. By saying maze, its not constricted strictly on the display of maze but it has its own modeling interface that can be used to design different type of patterns as well.

We started this project with a simple idea in mind , we wanted to be able to model a real world environment such as Building, Roads etc. and then later use it in various fields like games(3D maze) and even for 3D maps (displaying buildings etc.).

So, what does it do?

- Our project (3D Maze) has its own modeling interface where a user can design his desired pattern (..for maze), save his work then our program draws the model in 3D.
- So basically user can view their 2D drawn model in 3D.

What did we do?

- First we created a 2d simulator using Java to let user design their 2d pattern.
- Then we used different 3d-Graphics Algorithm to make it visible in 3D with appropriate view and lighting effect.

Algorithms Used:

- 1. Ray-Tracing Algorithm

Ray-Tracing Algorithm was used to get all the points inside a 2D area. We used this algorithm to detect if a surface contains a specified point or not.

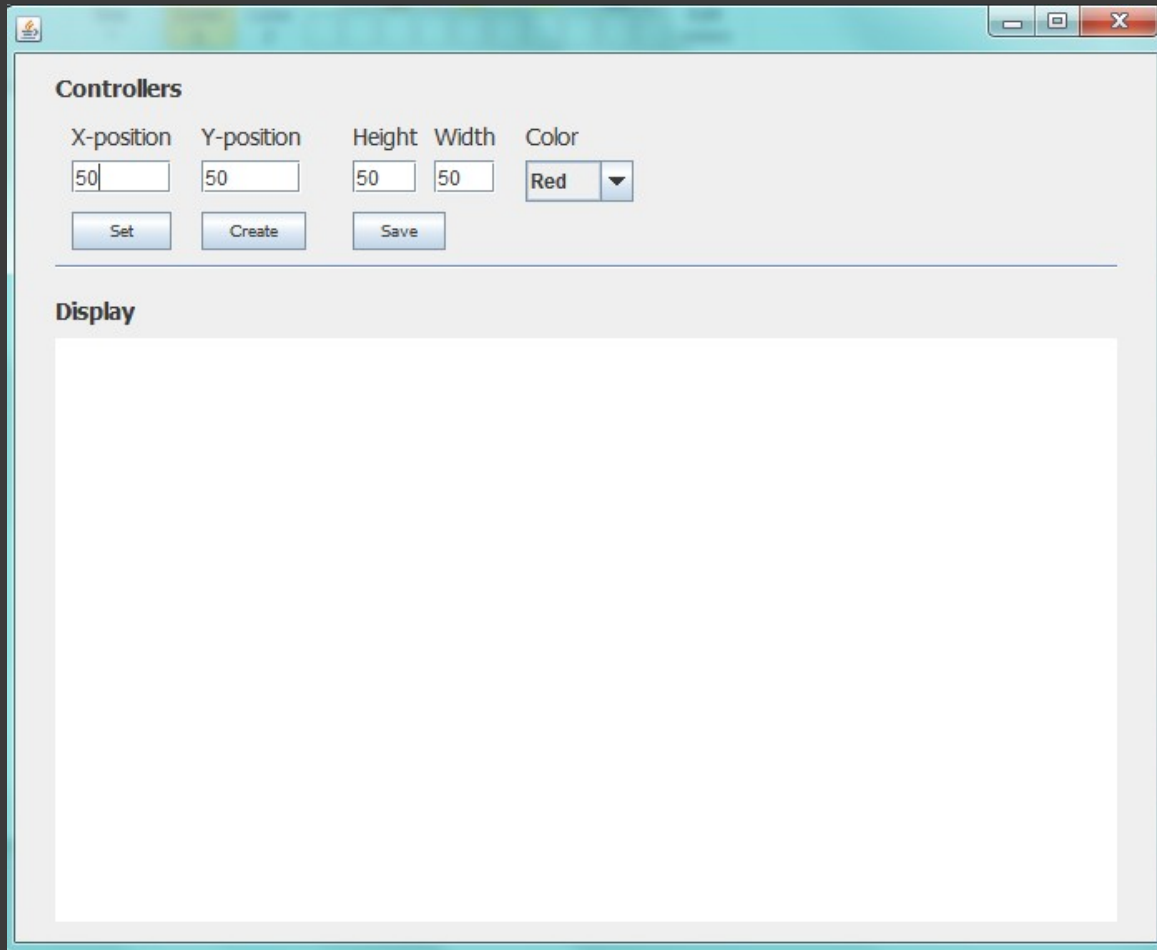
- 2. Z-buffer Visible surface detection

Visible surface detection was used to detect the visible part of the surface and then decide whether or not to draw the points inside the surface.

- 3. 3d-Transformation and Projection
- 4. Gouraud (also Flat Shading) for Surface Rendering

We implemented Gouraud Shading to interpolate the Intensity throughout the surface using the Intensity at the vertices.

Images



The image shows a screenshot of a software window titled "Controllers". The window has a standard Windows-style title bar with minimize, maximize, and close buttons. Inside the window, there are two main sections: "Controllers" and "Display".

The "Controllers" section contains a table with the following columns: X-position, Y-position, Height, Width, and Color. The values in the table are: X-position: 50, Y-position: 50, Height: 50, Width: 50, and Color: Red. Below the table, there are three buttons: "Set", "Create", and "Save".

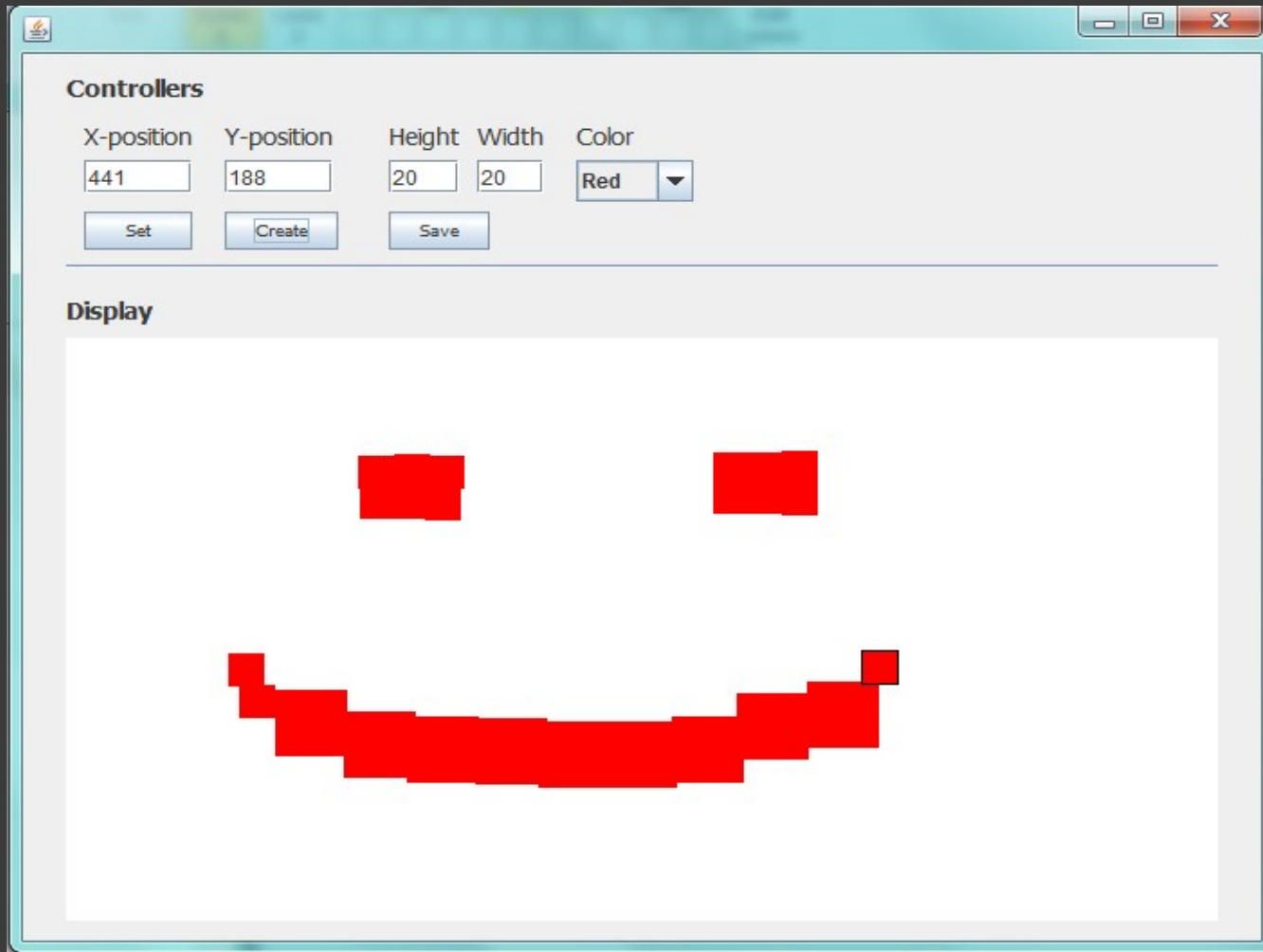
The "Display" section is a large, empty white rectangular area.

X-position	Y-position	Height	Width	Color
50	50	50	50	Red

Buttons: Set, Create, Save

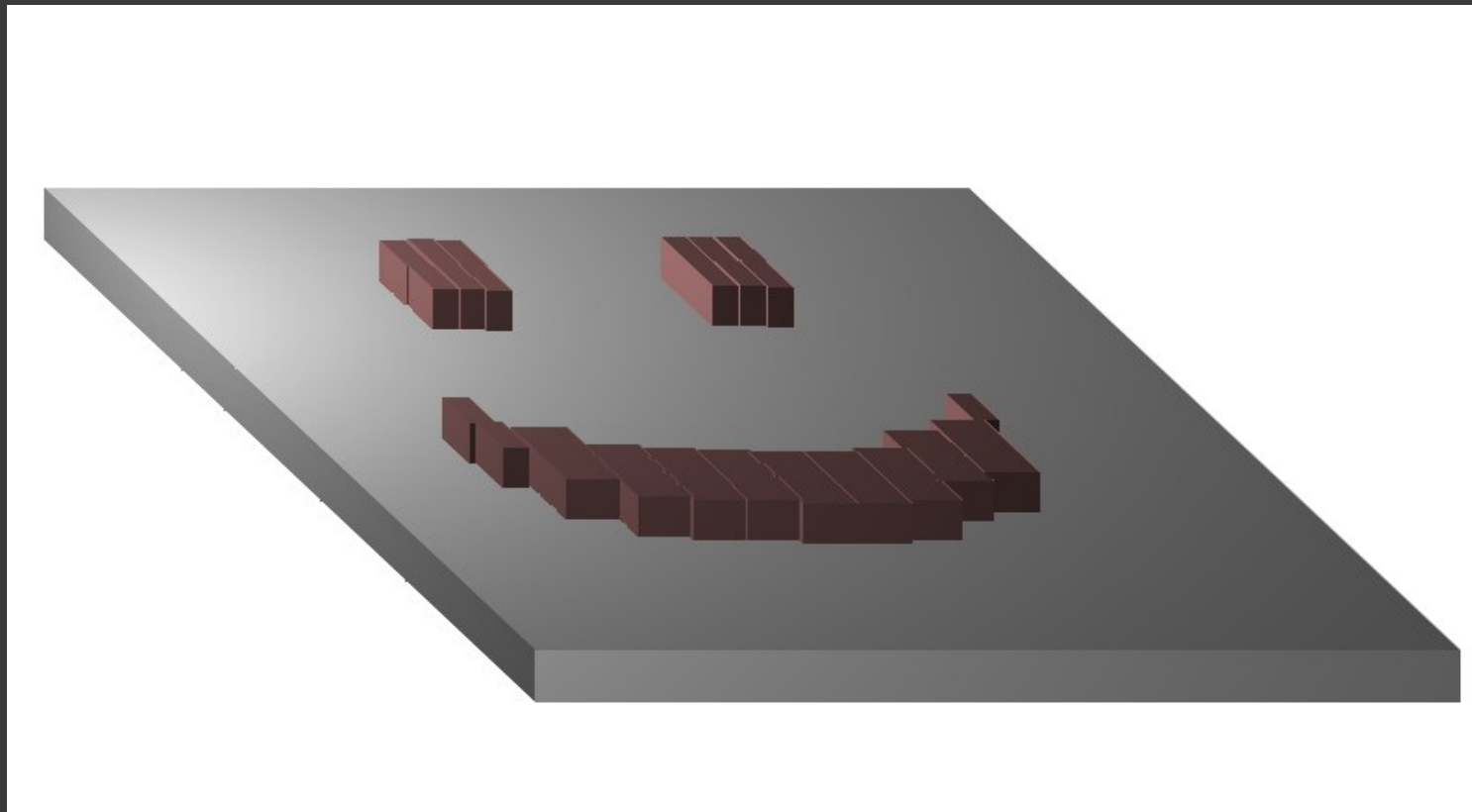
- This is the layout of the designing platform

Images



- We develop our design and save it

Images



- And then view it as 3d.