

Raytracing the Mandelbulb

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I. PURPOSE

This program is designed an implementation of an algorithm that takes the 2D Mandelbrot set and expands it to 3D allowing the user to control the creation of a 3D Mandelbrot set. Because the complex numbers only have 2D implementation the algorithm allows us to circumvent this by utilizing the polar coordinates to create our object than utilizing ray tracing we allow our rays to go a predetermined distance before bouncing back to the plane we created. The following is our result:

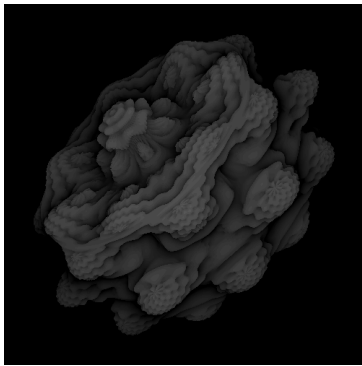


Fig. 1: The Final Prototype: Rickshaw Cart

II. REQUIREMENTS

We implemented the code on a Raspberry Pi 3B+ running Debian Stretch Version 9.9 which is a GNU/Linux based distribution. The modules imported are all based on the standard library and the code was written on a VIM. The graph is created using Matplotlib.pyplot to plot an array and we then save 'image.png' to a file in the directory. Further implementation will allow the user to select the file name.

- Numpy
- Matplotlib.pyplot
- Scipy
- Time
- Sys