

Through the wormhole

Team members

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The origin

We have all been fascinated by the movie 2001 : A space odyssey, so we wanted to create images alike to those in the stargate scene towards the end of the movie.

The problem

We have looked at different methods for generating fractals and have found a particularly interesting method for generating so-called flame-fractals. It involves taking a set of points, applying some linear transformations to it and then applying non-linear functions to generate fractal-like patterns. This method is interesting, but the fact the state of the system needs to be saved in each point to enable coloring made it an unfortunate choice to implement in Haskell.

Our solution

We have then thought of changing this method slightly such as to produce pretty results. We generate a set of points with positive Integer coordinates. We then apply linear transformations to this set which yields another set of Coordinates this time, which are decimal numbers (we have used double-precision floating point numbers). When creating the picture, we analyze each of this coordinates and apply a non-linear function to it. The difference compared to the original method is that we do not yield yet another set of double-precision floating point numbers, but we yield a color in the RGBA standard, result which we use to color the point (pixel) corresponding to that coordinate. The result of these functions can be observed in the attached pictures and one may notice that even though we did not actually move points around or modified in any way the property of the coordinates in a geometric way, applying a color-function can yield fractal-like structures, which we call color-fractals.

Instructions

The user needs to set 3 or 4 parameters, which are set in the input.hs file. The first two parameters are called variation1 and variation2. These can be regarded as linear functions which are used to turn a point into a coordinate. For variation1 we recommend values between 250 and 5000, depending on the non-linear functions which are used. There also is the howManyFunc parameter, which sets the number of functions used and the name of the function used. If the Integer value is 1, the user should add as a string the name of the function which is used when generating the picture. If the number is greater than 1, please enter "OTHERx" where x is the first element of the tuple.

Notes

The files Main.hs and Display.hs should not be changed unless one wants to modify the basic behaviour of the program. We cannot guarantee the results in this case.

Bibliography

Our work was inspired by the following article: [**http://flam3.com/flame.pdf**](http://flam3.com/flame.pdf)
, even though we ended up not using the method that was described there.