Problem Description

We try to define something called α-Voronoi diagrams and analyze some of its properties. While doing so, we define 2 different variants of the problem and come up with algorithms to compute the diagrams in both cases.

A more detailed description can be found in the presentation attached along with this file.

Instructions to Run the Code

Open the *simulation.py* file and run the program to generate both α-Voronoi diagrams and standard Voronoi diagrams.

To change the number of masses, change the variable *num_masses* in line 44.

To change the grid resolution of the Monte-Carlo simulation, change the array *num_points_list* in line 48.

To change the nature of randomness or reproduce results, change the seed in line 8.

The expected input is nothing.

The expected output will be two figures saved in the same directory as the code file. The first figure will be for α-Voronoi diagram and the second one will be the standard Voronoi diagram.

Visualising Fixed α-Voronoi Diagram

To aid in the interactive visualization of the fixed α variant, use the link Interactive Visualization.

Feel free to drag any of the five points around. One can also add or remove points by looking at the underlying equations available.

Try changing α in the range 0 - 0.5 using the slider. a represents α in the visualizer.