Normal Distribution Report

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1 Introduction

In this report, I will be explaining the process of plotting data around multiple fixed points. The data, specifically, were randomly generated with "normal distribution" and "standard deviation" in mind.

2 Methodology Applied

To obtain a result as such I started by defining the coordinates of the unit cube corners and the standard deviations as well as the amount of points that will appear per color(deviation) and corner so as not to hard-code them in. It allows the user to easily adjust fine details without having to understand every line of code.

"figure;" was called solely to erase any possible debris from previous executions.

"hold" value is switched "on" to enable plotting multiple dashes, circles, axes et cetera.

There are 3 nested for-loops and each serves a vital piece of contribution;

1- The outer-most loop: loops through the standard deviation values and also picks up the appropriate color on its way to the nested loop.

2- The loop in the middle: loops through the corners of the unit cube defined previously. The x, y and z coordinates of 50 points is computed logically in this loop and the necessary shift operation is being done across the unit cube, however the points are not yet plotted.

3- The inner-most loop: loops until it has plotted every single point in 3-dimensions for a particular standard deviation at a particular corner as its sole purpose. The scatter3() function call requires x,y,z values and optionally modification values such as the size, color and the points being "filled" or not. In this case, the color is picked up in the outer-most loop, the size is set to 10, and the "style" of the points plotted is "filled".

"plot3" function is called repeatedly to draw the unit cube in the canvas, with the color magenta and the style dashed. LineWidth modification was applied on it to make it pop among all the scattered data piles.

3 Conclusion

In conclusion, this report briefly explained the thought process of this project which aims to visualize the normal distribution of data like "clustered colorful clouds". The following is the preview of the said cube and data, can be looked into closely and in more detail by means of the MATLAB file dist.m

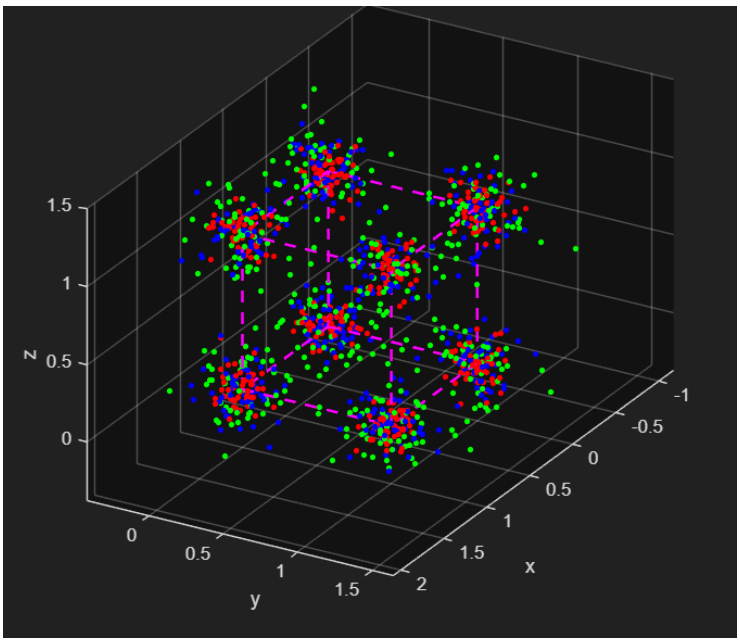

Figure 1: Normal Distribution Across a Unit Cube.