Why do walks with Hilbert seem to take so long?

Release 0.00

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Abstract

Hilbert curves look pretty sweet which is why I wrote this class. Take a look at the pictures and see for yourself.

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1 Introduction

Various space filling curves exist to map n-dimensional data to 1-D. One such curve, the Hilbert curve, has nice properties such as locality preservation.[1]

This class, `itkHilbertPath.h`, is used to construct a Hilbert spacing-filling curve (derived from `itkPath.h`). The path is defined by its dimensionality and order ($>= 1$) with its starting point at $[0]^{Dimension}$. The size of the path in each dimension is 2^{order} where each discrete location is visited by that path. For example, a 2-D Hilbert path of order 8 can map each pixel of a 256x256 image onto the 1-D path. More properties and visualizations can be found in various places on the web.

The implementation is based on [1] and is a direct porting of Aldo Cortesi's python code.[2]

[1] http://en.wikipedia.org/wiki/Hilbert_curve
[2] https://github.com/cortesi/scurve

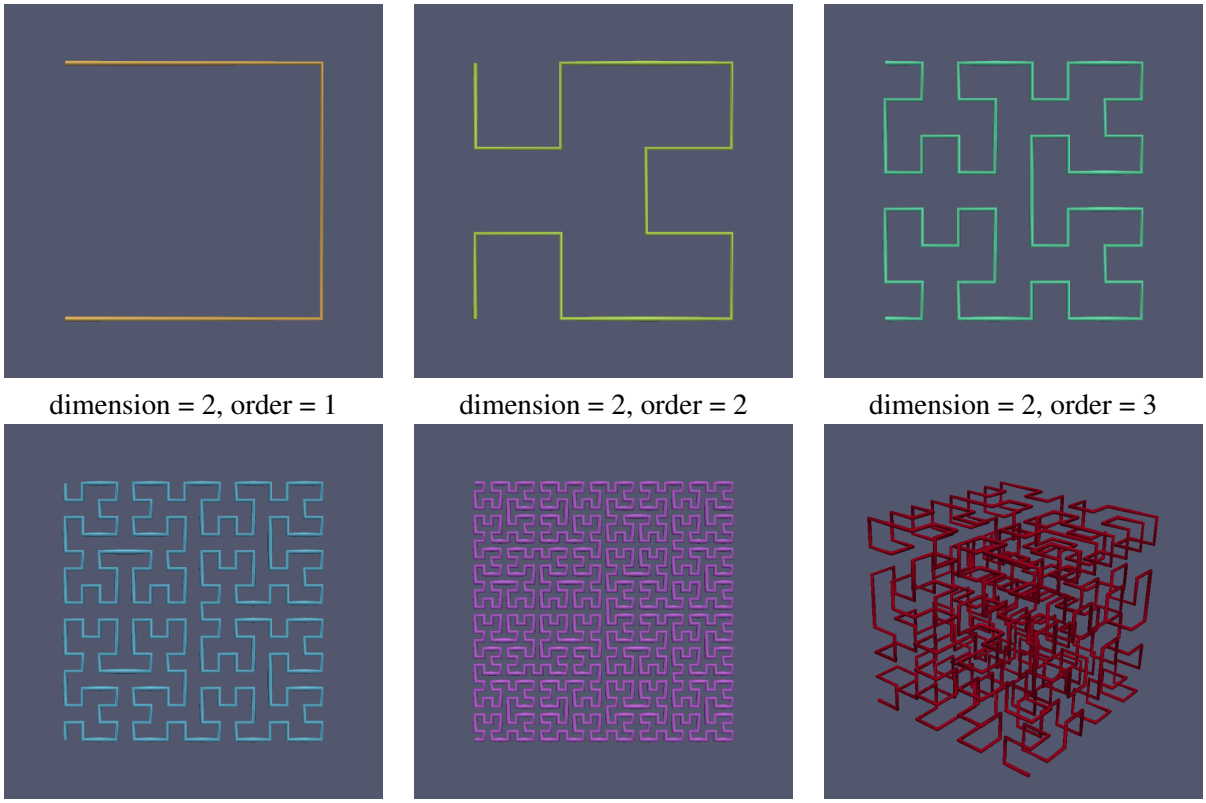

Figure 1: 2- and 3-D hilbert curves for different orders.

The code is fairly simple to use and is demonstrated in the accompanying file `MakeHilbertPath.cxx` which was used to create the images in Figure 1.

References

[1] Chris Hamilton. Compact hilbert indices. Technical report, Dalhousie University, 2006. 1