

CMSC427 Fall 2017

Lab 4 – Generating cylinder mesh

Due by midnight Thursday, Oct. 19
Online as combined PDF plus a PDE file

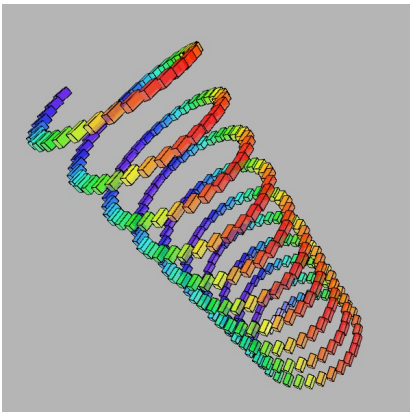
Objectives of lab:

- Work with parametric surface

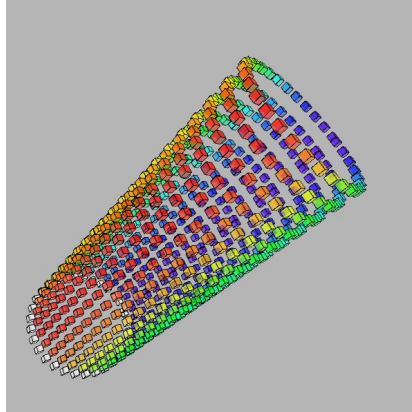
Requirements:

This assignment comes with an initial PDE file `HelixFly.pde`. This file generates a helix in 3D as a string of boxes. Your job is to convert this from a helix as a function of t to a cylinder as a function of (t,s) . You should change the picture created from the one on the left to the one on the right.

Helix

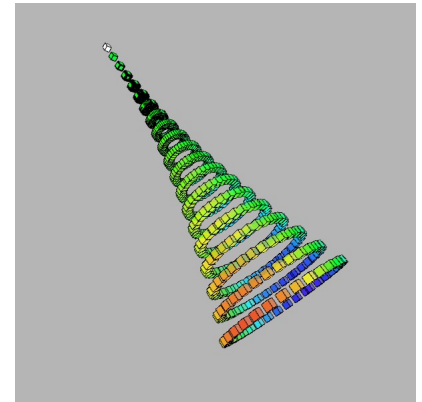


Cylinder



Finally, once you've got a cylinder play with the parametric equations for the cylinder. You can quickly generate shapes like this parabolic cone. Hint: keep s between $[0,1]$ and then you can use $\text{pow}(s,2)$ or other powers, like in the superellipse (and Phong equation).

You're free in this assignment to play with aspects of the program. The color interpolation works for the helix but has glitches at the end of the cylinder, so feel free to clean that up. Change the way the program rotates the 3D shape, change the constants used in the parametric curve, whatever you'd like, as long as the spirit of the assignment is met. You should create two new PDE files, one for a cylinder and one for a new shape.



To submit you should create a Word or other document that includes the following:

- A. A header with CMSC427 fall 2017 Lab 4 and your name.
- B. A short narrative with a description of your new shape
- C. A copy of the two PDE source code files from Processing in the PDF
- D. Save as PDF and submit, along with a separate copy of your PDE files.

As a lab, the requirements for code are lightweight in that you don't have to validate your program against all possible inputs, or work on the most general solution. Consider your program a working prototype. You're free to extend, play with, revise, and otherwise make the assignment yours.