

# 1 Lab 5 - Animation via Parametric Curves

## Goals

The goals for this lab are:

1. Practice using a `loop` control structure to `create` and `animate` along a `parametric` curves.
2. Practice using animation to control how much of a curve you draw for each frame

## Modality

**Pair or Individual (you may choose - partners of your own choosing)**

## Overview

This sketch takes its inspiration from Celtic knots - consider looking at images of Celtic knots to see if any of them look similar to the parametric curves defined in the resources.

## Details

**Task:** You must create a p5.js sketch which animates an expanding knot in the shape of a complex parametric curve. As the sketch animates the knot (ie the parameter controlling how much of the curve to draw) must increase. Coding your parametric curve may involve creating a curve using polar coordinates  $(r, \theta)$  that are converted into Cartesian  $(x, y)$  coordinates. You will need to think carefully about the values of variables to make the knot appear where you expect it to appear. You also need to think carefully about the loop parameter and how quickly values change in the equation to

make the animation smooth and appealing. For example, most curves will need small incremental values between zero and two  $\pi$ .

**The sketch** should plot an interesting parametric curve. See Resources for some examples. The curve must be more complex than just a spiral or circle - see the examples in Figure 1 and the resources from mathworld.

The sketch must be animated to have more and more of the curve appear over time.

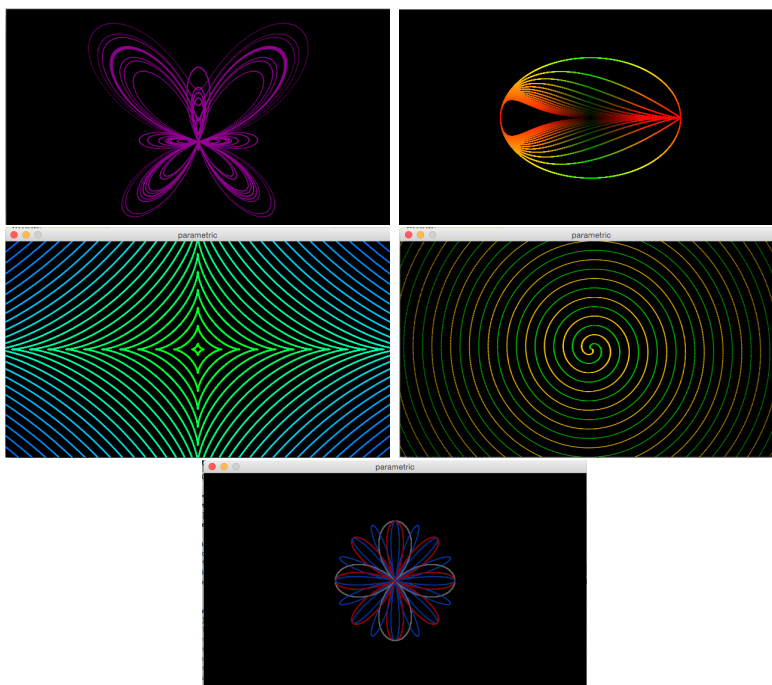


Figure 1: Examples of copies of various parametric curves adjusting the parameters for different sizes, colors, ect.

Your lab must:

- use a complex parametric curve
- include a representation of a Celtic Knot plotted using a parametric curve
- must animate by having the knot expand along the curve over time
- the animation must stop at a certain point
- be at least 400 x 400
- be in color

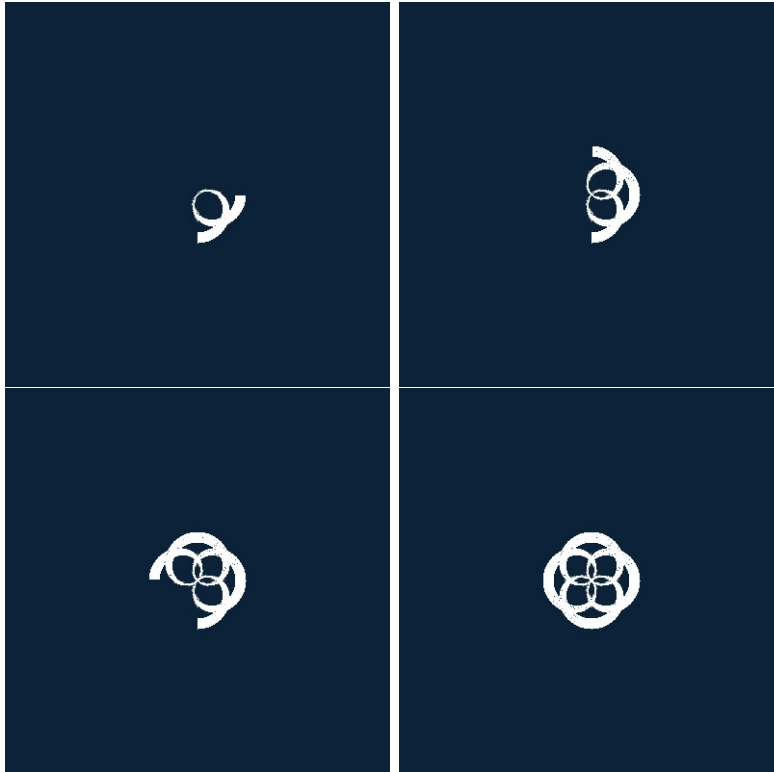


Figure 2: Examples of frames of an animation of a celtic knot like parametric shape created in p5.js.

### **Demo:**

In order to receive credit for this lab, you must demo your sketch to your instructor or TA. For every lab, your score will be broken down 75% for meeting the technical requirements and 25% for aesthetics.

### **Rubric for Grading**

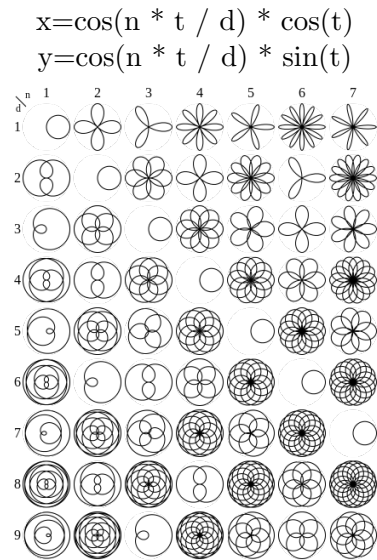
Your sketch will be graded based on your demo:

- 35 points: interesting celtic knot design, including width, placement, color, etc.
- 40 points: well timed animation of the sketch
- 25 points: Sketches are interesting looking organic and structured scenes

You must post the .js file for your lab on your web page.

## Resources:

- Parametric Rose: <http://mathworld.wolfram.com/Rose.html>



- Parametric Teardrop: <http://mathworld.wolfram.com/TeardropCurve.html>
- Parametric Butterfly: <http://mathworld.wolfram.com/ButterflyCurve.html>
- Parametric Astroid: <http://mathworld.wolfram.com/Astroid.html>