

Plotting Parametric Curves in 2D

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The goal of this assignment is plotting curves in 2D using modern OpenGL. For that purpose, we first need to sample the target curve into a sequence of 2D points. These points are stored into a point array.

1 Reference Code

A similar example is described at: <http://www.di.ubi.pt/~agomes/cg/praticas/sinc.zip>.

2 Who does what?

The first digit (the one furthest to the right) of the student number identifies the work. See next section to make sure about your assignment.

3 Exercises

0. Spiral of Archimedes (https://en.wikipedia.org/wiki/Archimedean_spiral).
1. Logarithmic spiral (https://en.wikipedia.org/wiki/Logarithmic_spiral).
2. Hypocycloid (<https://en.wikipedia.org/wiki/Hypocycloid>).
3. Butterfly ([https://en.wikipedia.org/wiki/Butterfly_curve_\(transcendental\)](https://en.wikipedia.org/wiki/Butterfly_curve_(transcendental))).
4. Cyclogon generated by an equilateral triangle (<https://en.wikipedia.org/wiki/Cyclogon>).
5. Prolate cyclogon generated by an equilateral triangle (<https://en.wikipedia.org/wiki/Cyclogon>).
6. Curtate cyclogon generated by an equilateral triangle (<https://en.wikipedia.org/wiki/Cyclogon>).
7. Cyclogon generated by a square (<https://en.wikipedia.org/wiki/Cyclogon>).
8. Cycloid <https://en.wikipedia.org/wiki/Cycloid>).
9. Folium of Descartes https://en.wikipedia.org/wiki/Folium_of_Descartes.
Folium of Descartes <https://mathworld.wolfram.com/FoliumofDescartes.html>).

References

- [1] Notes about 2D parametric curves: <https://www.math.stonybrook.edu/~ndang/mat126-fall20/chap7.pdf>
- [2] More notes about 2D parametric curves: <https://sites.und.edu/timothy.prescott/apex/web/apex.Ch10.S2.html>

- [3] The OpenGL Shading Language <https://www.opengl.org/registry/doc/GLSLangSpec.4.40.pdf>, last access on 08/04/2015.
- [4] Dave Shreiner, Graham Sellers, John Kessenich, and Bill Licea-Kane. OpenGL Programming Guide, 8th edition, version 4.3. Addison-Wesley, Upper Saddle River, 2013.