

Review

The authors present a lot of calculus to generate subdivisions of conics.

The reading is boring because we have to diggest a lot and a lot of calculus.

The pictures are illegible. In Figure 1, there are no axes !!!!

In theorem 2.1 : $\|S_{a^k} - S_{b^k}\| < \infty \Leftrightarrow \|S_{a^k} - S_{b^k}\|_\infty < \infty$ and explain the condition $< \infty$.

In theorem 3.5, why do you use C^1 ? Generally, we use G^1 . Let γ_0 be the curve defined by

$$\gamma_0(t) = \begin{pmatrix} -t^2 \\ t^2 \end{pmatrix}, \quad t \in [-1; 0] \quad (0.1)$$

and γ_1 be the curve defined by

$$\gamma_1(t) = \begin{pmatrix} t^2 \\ t^2 \end{pmatrix}, \quad t \in [0; 1] \quad (0.2)$$

you have $\gamma_0(0) = \gamma_1(0)$ and $\overrightarrow{\gamma'_0(0)} = \overrightarrow{\gamma'_1(0)} = \overrightarrow{0}$: the blend is C^1 . This blend is not G^1 because the tangent spaces to the curves γ_0 (resp. γ_1) at $(0,0)$ is $\Delta_0(y = -x)$ (resp. $\Delta_0(y = x)$): the tangent spaces are not the same.

I have the same remark about C^2 , theorem 3.10.

Page 11, i is not in the formula which defines f_i^0 .

In section 4, the authors generate conic section, but I do not see any example. Why does your method permit to realize a G^1 -blend between two curves using a conic section ? This work is very easy using an I.F.S. to compute subdivisions of central conics, see [Gar10, GDL12, DGL13]. In these works, at each step, a point of the conic and the tangent to the conic at this point are computed.

In fact, you must compare your work with methods given in the articles [Gar10, GDL12, DGL13] and explain why your method is better. For example, let γ_0 and γ_1 be two curves defined on $[0, 1]$. Let $A = \gamma_0(1) = (-2; 2)$ and $B = \gamma_1(0) = (2; 2)$, the components of the tangent vector to γ_0 (resp. γ_1) at A (resp. B) is $(1, 1)$ (resp. $(1; -1)$). Could you easily compute a subdivision of the conic which realizes a G^1 -blend between these two curves using your method ? Could you choose a circular arc to blend these curves ?

If you want to subdivide a hyperbola arc, could you have an endpoint on a branch and the other endpoint on the other branch ? A solution is given in [GDL12, DGL13].

References

- [DGL13] L. Druoton, L. Garnier, and R. Langevin. Iterative construction of Dupin cyclide characteristic circles using non-stationary Iterated Function Systems (IFS). *Computer-Aided Design*, 45(2):568–573, February 2013. Solid and Physical Modeling 2012, Dijon.
- [Gar10] L. Garnier. Constructions euclidiennes, dans le plan affine, d’arcs de coniques propres par des I.F.S. affines non stationnaires. *Revue Electronique Francophone d’Informatique Graphique*, 4(1):21–56, 2010.
- [GDL12] L. Garnier, L. Druoton, and R. Langevin. Subdivisions itératives d’arcs d’ellipses et d’hyperboles et application à la visualisation de cyclides de Dupin. *Revue Electronique Francophone d’Informatique Graphique*, 6(2):1–36, 2012.