

Interpolation of 3D data streams with C^2 PH quintic splines

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Algorithms for real-time interpolation of data streams are very useful for trajectory planning where, as a new target position (and possibly an associated direction of motion) becomes available, a suitable interpolating path has to be accordingly successively extended. In such context the flexibility of splines is clearly very useful, see [1] for their application to planar data stream interpolation. In this talk we will show how spatial PH quintic biarc splines can be effectively adopted in order to define a globally C^2 spatial path interpolating a stream of 3D Hermite data. The local interpolation scheme has three free parameters which can highly influence the shape of the local interpolating path, as usual with PH curves [2]. In order to facilitate the real-time usage of the method, such parameters are selected with analytic formulas which ensure fourth approximation order to the scheme [3]. The flexibility of the method is also extended adapting it also to the case where only streams of positions are given. Extensions of this research of interest for real-time rigid body motions are under development and will be possibly also briefly introduced.

Joint work with: Carlotta Giannelli, Lorenzo Sacco.

References

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- [3] C. Giannelli, L. Sacco, A. Sestini. Interpolation of 3D data streams with C^2 PH quintic splines, submitted, 2021.