

Hodograph based shape control for polynomial curves

Hwan Pyo Moon

Department of Mathematics, Dongguk University–Seoul, Korea

hpmoon@dongguk.edu

Although Bézier control polygons are useful tools to express and control the shape of polynomial curves, they are not suitable to control Pythagorean hodograph (PH) curves, since any slight modification of a single Bézier control points make the curve lose the PH property. To remedy this problem, different types of control polygons such as the Gauss–Legendre polygon [1, 2] and the Gauss–Lobatto polygon [2] were introduced. In this work, we analyze the shape control functionality of these polygons from the viewpoint of hodographs. Edges of these polygons can be understood as points in the hodograph space, and the curve construct process corresponds to computing the hodograph that interpolates the velocity data followed by integrating it. This approach can be applied not only to PH curves but also to general polynomial curves.

References

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