ConicCurv: a curvature estimation algorithm for planar polygons

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This work presents a derivative free algorithm (*ConicCurv*) to estimate the curvature of a plane curve from a sample of data points. It is based on a known method to estimate tangents that is grounded on classic results of Projective Geometry and Bézier rational conic curves [1]. The curvature values estimated by ConicCurv are invariant to Euclidean changes of coordinates and reproduce the exact curvature values if the data are sampled from a conic. It is shown that ConicCurv has convergence order 3 and if the sample points are uniformly arclength distributed, the convergence order is 4. The performance of ConicCurv is compared with some of the most frequently used algorithms to estimate curvatures [2] and its effectiveness is illustrated in the calculation of L-curves corners [3].

References

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