

Numerically robust computation of circular visibility

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We use the so-called Smooth Minimum Arc Path (SMAP) for a compact approximation with arc splines, which are curves composed of smoothly joint circular arcs and line segments. It provides an arc spline with a minimal number of segments with respect to a predefined maximum error.

Therefore, the data we want to approximate is surrounded by a so-called tolerance channel and the basic step of the algorithm is to compute the circular visibility set. A point is circularly visible if it can be reached by an arc that starts at a certain start segment and does not leave the tolerance channel. We provide a simple and numerically stable linear time algorithm that solves this problem.