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Computing Topologically Correct Spline Curve Approximations by Subdivision.

Spline curves are commonly approximated for display and analysis by Piecewise-Linear (PL) curves derived from either interpolating points or control points. Recent theorems give sufficient conditions for such PL approximations to be topologically equivalent to their curve. This equivalence is by ambient isotopy, which is stronger than traditional equivalence by homeomorphism. A large class of curves are shown to have their initial control polygons be non-isotopic to the curve, yet sufficiently many subdivisions will yield an isotopy. A tractable algorithm will be provided to demonstrate ambient isotopic approximations of a spline curve, with discussion of a novel geometric seeding algorithm for Newton's method. (Received September 02, 2006)