

ABSTRACT. The fields of computer aided geometric design and fractal geometry have evolved independently of each other over the past several decades. However, the existence of so-called *smooth fractals*, i.e., smooth curves or surfaces that have a self-similar nature, is now well-known. Here we describe the self-affine nature of quadratic Bézier curves in detail and discuss how these self-affine properties can be extended to other types of polynomial and rational curves. We also show how these properties can be used to control shape changes in complex fractal shapes by performing simple perturbations to smooth curves.