DIMENSIONS OF THE GRAPHS OF α-FRACTAL INTERPOLATION FUNCTIONS

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Abstract. A fractal set is a union of many smaller copy of itself and it has a highly irregular structure. Using Hutchinson's operator, Barnsley, introduced Fractal Interpolation Function (FIF) via certain Iterated Function System (IFS). The FIF is continuous and self-affine in nature. By defining IFS suitably, one can construct various form of fractal functions including non-self-affine and partially self-affine (and partially non-self-affine) FIFs. For any continuous function f, the corresponding fractal analogue f^α is non-self-affine, continuous, nowhere differentiable function and it was defined by Navascuéss. The function f^α, known as α-fractal interpolation function, generates a family of continuous functions corresponding to the original function f for different scale vector $\alpha = (\alpha_1, \alpha_2, \ldots, \alpha_N) \in (-1, 1)^N$. The fractal function f^α interpolates and approximates f. Kolomogorov, introduced the notion of fractal dimension which later demonstrated by Mandelbrot to quantify irregular patterns. The fractal dimension or box dimension measures the complexity or irregularity of sets. It is seen in the literature that the graphs of FIFs have non-integer Hausdorff-Besicovitch dimensions. The present talk is mainly devoted to the study pertaining to fractal dimensions and approximations of α-fractal interpolation functions.