New Contributions to Fractal Interpolation Theory

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joint work with
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Abstract

We present a new fractal interpolation scheme. More precisely we consider \( a, b \in \mathbb{R}, \ a < b, \ \mathbb{A} \subseteq \mathbb{R} \) such that \( \{a, b\} \subseteq \mathbb{A} \subseteq [a, b] \) and \( \mathbb{A} = \emptyset \) and prove that for every continuous function \( f : \mathbb{A} \rightarrow \mathbb{R} \) there exist a continuous function \( g^* : [a, b] \rightarrow \mathbb{R} \) such that \( g^*|_{\mathbb{A}} = f \) and a possible infinite iterated function system whose attractor is the graph of \( g^* \). If \( \mathbb{A} \) is finite we obtain the classic Barnsley’s interpolation scheme and for \( \mathbb{A} = \{x_n \mid n \in \mathbb{N}\} \cup \{b\} \), where \( x_1 = a, \ \lim_{n \to \infty} x_n = b \) and \( x_n \in [a, b] \) for every \( n \in \mathbb{N} \), we obtain a countable scheme due to N. Secelean. Our interpolation scheme permits \( \mathbb{A} \) to be uncountable as it is the case of Cantor ternary set.

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