

Peano curves with smooth footprints

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Abstract

We construct Peano curves $\gamma: [0, \infty) \rightarrow \mathbb{R}^2$ whose “footprints” $\gamma([0, t])$, $t > 0$, have C^∞ -boundaries and are tangent to a common continuous line field on the punctured plane $\mathbb{R}^2 \setminus \{\gamma(0)\}$. Moreover, these boundaries can be taken C^∞ -close to any prescribed smooth family of nested smooth Jordan curves contracting to a point..