

Filling holes with edge reconstruction

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Abstract

Let D be a domain and $H \subset D$. Let $D_1, D_2 \subset D$ be such that $D - H = D_1 \cup D_2$ and $\overline{D_1} \cap \overline{D_2} = P$, being P a non-connected curve. Let us suppose that, for $i = 1, 2$, we have C^1 -functions f_i defined in D_i in such way that the piecewise function f defined as $f_i(x, y)$ if $(x, y) \in D_i$ is just continuous along the curve P , i. e., P is an ‘edge’ in the graphic of f which is unknown inside the hole of the graphic of f over H . In this work we propose a method to construct another function s_f , defined in the whole D , in such a way that:

- i) P is reconstructed inside H ;
- ii) s_f approximates f in $D - H$;
- iii) s_f interpolates f in a set of points of P ;
- iv) s_f extends the ‘shape’ of f from $D - H$ to H by respecting the edge P .

That is, s_f is a reconstruction of f which respects the ‘edge’ of its graphic over P and extends it to H . We give the basic theoretical results and we show some graphical examples to illustrate the proposed method.

References

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