

# Classification of stable maps from a simply connected subset of $\mathbb{R}^2$ to $\mathbb{R}^2$

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Classification of mappings is an important issue in robotics (motion planning, design and analysis of serial and parallel manipulators). From the theoretical point of view, classification of mappings is related to their singularities. I will recall some results : Thom transversality theorem and its corollaries (Whitney theorem and Morse theory) which give local properties of generic maps. During the second part of the talk, I will present an algorithm based on interval analysis providing a global invariant (up to smooth diffeomorphisms). Given a smooth map  $f$  from a compact simply-connected domain of  $\mathbb{R}^2$ , the method computes a planar graph homeomorphic to the apparent contour.