Manifold Processing from scattered points: application to thin shell analysis

R. D. Millán, A. M. Rosolen and *M. Arroyo

LaCàN, Universitat Politècnica de Catalunya, C/Jordi Girona 1-3, Barcelona 08934, Spain.
E-mail: marino.arroyo@upc.edu

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ABSTRACT

We present a method for point-based (embedded) manifold processing avoiding any kind of mesh or tessellation. A fundamental difficulty in this endeavor is the absence of an obvious parametric space for general surfaces. In mesh-based processing, the mesh not only provides a geometric description of the surface, but it also provides a support to local parametric spaces and shape functions. Nonetheless this approach is seriously hindered in high dimensions. We apply weighted principal component analysis together with maximum entropy approximants to provide a robust method for point–based manifold processing.

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