A FAST RADIAL BASIS FUNCTIONS METHOD FOR SOLVING PARTIAL DIFFERENTIAL EQUATIONS ON ARBITRARY SURFACES

CECILE PIRET

Michigan Technological University, Mathematical Sciences, 1400 Townsend Dr, Houghton, Michigan 49931, USA
email: cmpiret@mtu.edu

The RBF Orthogonal Gradients Method (OGr) allows us to compute differential operators restricted to general surfaces in $\mathbb{R}^3$ just by means of point clouds. It also benefits from RBFs' strengths: simplicity, high accuracy and also a meshfree character, which gives the flexibility to represent the most complex geometries. We are introducing a fast version of the OGr algorithm, which makes use of RBF-generated finite differences to discretize the differential operators.

REFERENCES

[1] Piret C. "The Orthogonal Gradients Method: a Radial Basis Functions Method for Solving Partial Differential Equations on Arbitrary Surfaces", *Journal of Computational Physics*, **231**(14), 4662–4675, (2012).

[2] Piret C. "The Fast Orthogonal Gradients Method: a Radial Basis Functions Method for Solving Partial Differential Equations on Arbitrary Surfaces", to be submitted.