

Selection of the shape parameter in RBF interpolation using univariate global optimization techniques

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We consider the problem of finding an optimal value of the shape parameter in radial basis function interpolation (see e.g. [2]). In particular, we propose the use of a leave-one-out cross validation (LOOCV) technique [3] combined with univariate global optimization methods, which involve strategies of Global Optimization with Pessimistic Improvement (GOPI) and Global Optimization with Optimistic Improvement (GOOI) [1, 4, 5]. This choice is done to overcome the serious issues of the commonly used optimization routines that sometimes lead to shape parameter values quite distant from being globally optimal. Numerical experiments show performance and efficacy of our new algorithms, called LOOCV-GOPI and LOOCV-GOOI.

References

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