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Fred J. Hickernell* (hickernell@iit.edu), Room E1-208, Applied Mathematics, Illinois Institute of Technology, 10 W. 32nd St., Chicago, IL 60616. *Kernel Based Function Approximation in High Dimensions.*

Optimal methods for approximating functions in a Hilbert space based on noisy data employ the reproducing kernel of that Hilbert space. Such methods include smoothing splines, radial basis function methods, meshfree methods, etc. This kernel can also be used to provide a tight error bound. This talk highlights new error bounds whose convergence rates are independent of the dimension. This depends on a good choice of function space and a good design. (Received September 17, 2009)