

# Moving Least Squares Approximation on Random Data

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In scattered data approximation one deals with the problem of approximating a function from given meshless data.

The moving least squares (MLS) approximation can be seen as a localized approach to scattered data approximation. Instead of obtaining one global approximation from all the data, one computes many local approximations of low degree using only local subsets of the data. This avoids the costly solution of a large system of equations and allows to locally adapt the approximation process.

In this talk we investigate the error of the MLS approximation if the given data is random, following some distribution  $\rho$ . We derive a concentration inequality for the involved Lebesgue constant which in turn leads to probabilistic error bounds for the MLS approximation.