

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Analysis of discrete least squares on
polynomial spaces with random and
deterministic evaluations**

邀请人: 周涛 博士

报告时间: **2014 年 3 月 18 日 (周二)**

上午 10: 00

报告地点: **科技综合楼三层 311**

计算数学所报告厅

Abstract:

In this talk we address the multivariate discrete least-squares approximation methodology, to approximate a smooth function depending on a multivariate random variable, or the solution to PDEs with stochastic data.

We review the recent results achieved in [1,2,3,4] concerning the analysis of discrete least squares on polynomial spaces, in the case of random evaluation points distributed according to the beta density (including uniform and Chebyshev densities).

In particular, we prove conditions between the number of evaluation points and the dimension of the polynomial approximation space that ensure the stability and accuracy of the least-squares approximation.

Then we analyze the stability and accuracy of discrete least squares in the case where deterministic evaluation points are judiciously chosen.

[1] A.Cohen, M.Davenport and D.Leviatan, On the Stability and Accuracy of Least Squares Approximations, Found. Comput. Math., 2013.

[2] G.Migliorati, F.Nobile, E.von Schwerin and R.Tempone, Analysis of Discrete L2 Projection on Polynomial Spaces with Random Evaluations, Found. Comput. Math. (electronic version), 2014.

[3] A.Chkifa, A.Cohen, G.Migliorati, F.Nobile and R.Tempone, Discrete least squares polynomial approximation with random evaluations - application to parametric and stochastic elliptic PDEs, EPFL MATHICSE report 35/2013. Submitted.

[4] G.Migliorati, Polynomial approximation by means of the random discrete L2 projection and application to inverse problems for PDEs with stochastic data, Ph.D. thesis, Politecnico di Milano, Italy, and Ecole Polytechnique, France, 2013.

欢迎大家参加!