

Prof. Fabio Nobile

Mathematics Institute of Computational Science and Engineering - MATHICSE

SEMINAR OF NUMERICAL ANALYSIS

➤ **WEDNESDAY 20 MAI 2015 - ROOM INF 119 - 16h15**

Dr. Christian RIEGER (University of Bonn, Institute of Numerical Simulation, Bonn, Germany) will present a seminar entitled:

"Reproducing kernel methods for parametric partial differential equations"

Abstract:

In this talk, we address the problem of approximating the solution of a parametric partial differential equation using reproducing kernel methods.

The number of parameters in the differential equation determines the dimension of the resulting reconstruction problem which is in most application prohibitively large.

The partial differential equation allows, however, in many practical situations, to identify a smaller set of important parameters and to exploit regularity properties of the solution viewed as a function of the parameters. We will express this fact by constructing problem adapted reproducing kernels. For a large class of regularized reconstruction schemes based on these kernels, we show deterministic a priori (often exponential) convergence rates by means of sampling inequalities.

Our estimates allow in addition to derive a priori couplings of several discretization parameters. Our analysis includes in particular the error in solving the partial differential equation numerically, the error made in the linear algebra by computing the optimal reconstruction and the number of sampling points in the parameter domain.

This is partly based on joint work with M. Griebel (Bonn University).

Lausanne, 28 April 2015/FN/cr