

Veranstaltungen im Wintersemester 2015/16

Das sechszwanzigste Treffen des Rhein-Main Arbeitskreises findet

Freitag, den 5. Februar 2016, 15:00 Uhr

an der

**[Goethe-Universität Frankfurt, Fachbereich Mathematik,](#)
Robert- Mayer-Str. 10,
60325 Frankfurt**

statt.

Programm

15:00 Uhr: [Prof. Mike Giles \(University of Oxford\)](#)

Multilevel Monte Carlo for reduced accuracy computations

Motivated by FPGAs and GPUs which are capable of performing computations with different levels of precision at different speeds, we consider Multilevel Monte Carlo simulations for SDEs with varying accuracy on different levels. This includes both the accuracy of individual arithmetic operations due to the roundoff error, and the accuracy in the approximation of intrinsic functions such as the inverse error function or the inverse Normal CDF which can be used to convert uniform random variables into Normal random variables.

The emphasis in the presentation will be on the construction of valid multilevel approximations, and their mathematical modeling and analysis, but we hope to have some numerical results as well -- this will be work to be completed during the two weeks before the talk!

Co-authors: Klaus Ritter, Mario Hefter, Steffen Omland

15:45 Uhr: Tee/Kaffee

16:15 Uhr: [Prof. Dr. Oliver Kolb \(Univ. Mannheim\)](#)

Modeling, simulation and optimization on networks.

In the main part of this talk, we consider several applications on networks within a unified simulation and optimization framework, in particular gas and water supply networks, road traffic and production systems. Based on the underlying macroscopic models, we first apply appropriate discretization schemes to each problem. To solve optimization tasks, we use an SQP solver and compute gradient information with a first-discretize adjoint approach. The latter information can additionally be exploited for error estimation and an adaptive simulation/optimization algorithm. Various numerical results are shown to demonstrate the applicability of the presented framework. Finally, if time permits, some recent results on WENO discretization schemes will be discussed.

17:00 Uhr: [Dipl.-Math. Dominik Garmatter \(Goethe-Universität Frankfurt\)](#)

The reduced basis method and its application to inverse problems.

The numerical solution of nonlinear inverse problems such as the

identification of a parameter in a partial differential equation (PDE) from a noisy solution of the PDE via iterative regularization methods usually requires numerous amounts of forward solutions of the respective PDE. Since this can be very time-consuming, it is highly desirable to speed up the solution process.

The reduced basis method is a model order reduction technique that can yield a significant decrease in the computational time of the PDE solution, especially in a many-query context as it is the case in the above situation.

The first part of this talk will provide an introduction to the reduced basis method for elliptic, coercive problems. The second part will deal with the task of combining the reduced basis method with iterative regularization algorithms for ill-posed inverse problems in order to reduce their overall computational time. The main objective will be the development of the new Reduced Basis Landweber method. Numerical results will fortify the approach.

anschließend: Nachsitzung

Informationen zur Anreise finden Sie [auf dieser Seite](#). Bei Anreise mit dem PKW besteht die Möglichkeit nach vorheriger Anmeldung das Parkhaus der Goethe Universität, Ecke Gräpfstraße/Mertonstraße zu nutzen. Bitte melden Sie sich dazu bis 22.01.2016 unter Angabe des vollen Namens und des Nummernschildes bei Frau [Marie Menzel](#).