Ankündigung

Wintersemester 2019/2020

ALGORITHMIC OPTIMIZATION (ALOP) – KOMPAKTKURSE

„Tensor Numerical Methods in Scientific Computing“
Prof. Dr. Boris Khoromskij (assistant Dr. Venera Khoromskaia)

Solution of multi-dimensional problems by traditional numerical methods suffer from the so-called "curse of dimensionality", that cannot be eliminated by using parallel architectures and high performance computing. The novel tensor numerical methods are based on a "smart" rank-structured tensor representation of the multivariate functions and operators, thus reducing solution of multidimensional integral-differential equations to 1D calculations. We show how the canonical, Tucker, tensor train (TT), quantized-TT (QTT) and range-separated tensor approximations provide the way to solve the multi-dimensional equations on low-parametric rank-structured manifolds. We consider tensor methods for the elliptic optimal control problems, for elliptic PDEs with oscillating coefficients and for some quantum chemical models. Matlab exercises for the tensor decomposition algorithms will be provided.

Date, times and locations are as follows:

Monday,	***18 Nov 2019***	***12:00 – 14:00***	***E 52***
Tuesday,	***19 Nov 2019***	***10:00 – 12:00***	***E 45***
Wednesday,	***20 Nov 2019***	***14:00 – 16:00***	***HS 10***
Thursday,	***21 Nov 2019***	***14:00 – 16:00***	***E 10***
Friday,	***22 Nov 2019***	***10:00 – 12:00***	***E 44***
Monday,	***2 Dec 2019***	***12:00 – 14:00***	***E 52***
Tuesday,	***3 Dec 2019***	***10:00 – 12:00***	***E 45***
Wednesday,	***4 Dec 2019***	***14:00 – 16:00***	***HS 10***
Thursday,	***21 Nov 2019***	***12:00 – 14:00***	***E 10***
Friday,	***6 Dec 2019***	***10:00 – 12:00***	***E 44***