Sonderforschungsbereich 611

Singuläre Phänomene und Skalierung in mathematischen Modellen

Einladung zu einem Vortrag im SFB-Seminar

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spricht zum Thema

Fast and efficient orthogonal transforms for high dimensional integration

Zeit: **Dienstag, den 18. Dezember 2012, 15.30 Uhr**

Ort: **Kleiner Hörsaal, Wegelerstr. 10**
Kaffee/Tee: 16.30 Uhr

gez. **Michael Griebel**

Abstract: It has been found in the late 1990's that certain alternative methods for generating Brownian paths can help to increase the efficiency of quasi-Monte Carlo methods, especially for applications in finance.
Prominent examples from quantitative finance are provided by the Brownian bridge construction (Moskowitz et. al., 1996) and the Principal Component Analysis construction (Acworth et. al., 1998) for sample paths of Brownian motion.
It was later observed by Papageorgiou (2002) that 1. those transformations do not increase efficiency for arbitrary problems, rather they can slow things down for some problems; 2. those transforms can be understood as orthogonal transforms of the standard normal input vector.
Imai and Tan (2007) proposed to look for orthogonal transforms tailored to a given (finance) problem. Up to now, most work concentrates on making the problem "as one-dimensional as possible" by choosing some orthogonal transform that puts as much variance as possible onto the first input variable. We show how Householder reflections can be used to find efficient orthogonal transforms in that context.
We also talk about higher order methods for the same class of problems.