Announcement

Advanced Monte Carlo Methods

Dr. Jürgen Stockburger

Description

Monte Carlo methods use random numbers for the numerical solution of complex stochastic problems or approximate integration in high-dimensional domains. While elementary methods may directly identify measures appearing in problem and algorithm, more complex methods construct Markov chains with a stationary distribution identical to a target distribution. Fixing the target distribution puts fairly mild conditions on the construction of the chain, resulting in a rich variety of algorithms.

Available topics:

1. Elementary Monte Carlo Methods
2. Metropolis-Hastings Algorithm
3. Random Number Generators
4. Hamiltonian Monte Carlo Method
5. Multicanonical Monte Carlo Method
6. Auxiliary-Variable Monte Carlo Method (Master program)
7. Quantum Monte Carlo Method (Master program)
8. Monte Carlo Methods in Finance

Prerequisites

- Any course including elementary probability theory.

Additional Information

The module is suitable for Bachelor and Master students.

Each student has to give a presentation on one of the topics.

Preparation, oral presentation, discussion and (additionally only for Advanced Seminar: separate written report) are graded.

Seminar: 3 ECTS credits

Advanced seminar: 4 ECTS credits

Lecturer

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