CARL VON OSSIETZKY universität OLDENBURG
Institut für PHYSIK

P H Y S I K A L I S C H E S K O L L O Q U I U M

E I N L A D U N G

23.11.2010/Wh

Am Montag, dem 29.11.2010, 16.15 Uhr in W2 1-148

spricht

Prof. Dr. Herbert Jaeger
School of Engineering and Science
Jacobs University Bremen

über

“An introduction to observable operator models of stochastic processes”

Observable Operator Models (OOMs) are a generalization of hidden Markov models (HMMs). They can be represented by a matrix formalism that is completely analog to HMMs, with the only difference that negative entries are allowed in the matrices and vectors. This little difference has far-reaching consequences:

- OOMs have a fundamentally different concept of state, namely, a state is an encoding of the future distribution of the process
- OOMs can model essentially every stochastic process, i.e. they do not specify a particular class of processes but yield a general representation theory of stochastic processes as a subtheory of linear algebra
- The linear theory of OOMs leads to a novel class of learning algorithms for stochastic processes, which are asymptotically correct, constructive, statistically efficient, and fast

The talk gives an introduction to the basic concepts of OOM theory. When that is done, we'll decide together which further aspects of current OOM research will be presented - the main choices being (i) efficient learning algorithms, (ii) general mathematical theory of stochastic processes, (iii) connection to quantum mechanics and quadratic OOMs, (iv) modeling controlled stochastic systems and networks of interacting OOMs.

Einladender: Volker Hohmann