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## Vortragsankündigung

Seminar Regelungssysteme LV 0430L654

Mittwoch, 24. Oktober 2012, 16:30 Uhr

Vortragort: EN 223

**Prof. Jian-Hua Zhang**  
East China University of Science and Technology

“Classifying Operator Functional State by Correlation Spectral Analysis and Hidden Markov Models”

The vulnerability or breakdown of human operator performance can cause catastrophic consequences in operational scenarios of safety-critical human-machine systems. How to cope with this issue by accurately estimating or predicting the Operator Functional State (OFS) is critical but very challenging. A simpler but essential problem involved is how to accurately classify the time-varying OFS into a few discrete levels (categories). In this talk, the data acquisition experiments, conducted by using the automation-enhanced Cabin Air Management System (AUTO-CAMS) simulation software platform, will be first introduced. Then A subject-specific optimal feature extraction approach via spectral correlation analysis (SCA) will be presented. Based on the feature extraction, the Hidden Markov Model (HMM) was employed to classify the instantaneous (or momentary) OFS at each time instant into three groups. Some guidelines for HMM parameter initialization were given. The data analysis results have shown strong capacity of time-series signal modeling of the HMM approach when being applied to the OFS multi-class classification problem.