



**Technische Universität Berlin**  
Fakultät IV Elektrotechnik und Informatik  
Fachgebiet Regelungssysteme  
Leitung: Prof. Dr.-Ing. Jörg Raisch  
Skr. EN 11, Tel. 314-22999



## Vortragsankündigung

Seminar Regelungssysteme LV 0430L654

Montag, 29. Oktober 2012, 11:15 Uhr  
Vortragsort: EN 223

**Zhong Yin**  
East China University of Science and Technology

“Identifying Changes in Human Operator Mental Workload by Locally Linear Embedding and Support Vector Clustering Approaches”

In order to reduce the accident caused by inattention or high cognitive load of human operator, researchers began to study the operator functional states (OFS) which describe operator performance in safety-critical human-machine systems. A question that has received much less attention in the literature is how to detect the changes in OFS without a priori knowledge of the task environment. We proposed a psychophysiological-signal-based clustering framework for detecting the changes in operator mental workload incurred by a simulated process control task. A combination of locally linear embedding and support vector clustering approaches is adopted. The unsupervised method is shown to be able to extract features from several channels of the electroencephalogram (EEG) data and to determine whether or not the level of mental workload changes. Simulation results have also demonstrated that a few data clusters can be derived to interpret the change in the operator workload.