



**ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ**  
**ΣΧΟΛΗ ΧΗΜΙΚΩΝ ΜΗΧΑΝΙΚΩΝ**

**ΕΠΙΤΡΟΠΗ ΣΕΜΙΝΑΡΙΩΝ, Καθηγητής Α. Κοκόσης**

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Ηρώων Πολυτεχνείου 9, Πολυτεχνειούπολη Ζωγράφου, Αθήνα 15780  
Πληροφορίες: **Α. Μουντράκη**, Τηλ.:210 772 3129, Fax: 210 772 3228,  
E-mail: [mountrak@central.ntua.gr](mailto:mountrak@central.ntua.gr)

**ΣΕΜΙΝΑΡΙΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ**

**Πέμπτη 2 Ιουνίου 2011, 16:00**  
**Αίθουσα Σεμιναρίων «Ν. Κουμούτσου»**

**Professor Shao Zhijiang**

**Department of Control Science and Engineering**  
**Zhejiang University, Hangzhou, China**

**Advanced Strategies for Real-Time Process  
Optimization**

Real-time optimization (RTO) is an on-line activity to achieve optimal operation that leads to maximum profitability, energy saving, and environmental conservation. Moreover, the development of dynamic real-time optimization (D-RTO) strategies enables to overcome the inconsistency between steady-state RTO and LMPC. One important challenge to carry out (D-)RTO strategy is to solve the large-scale, complex model based nonlinear programming (NLP) problems robustly and efficiently. Advanced algorithmic and technical strategies developed recently in PSE group of Zhejiang University will be presented and some applications will be given.

Methods of mnemonic enhancement optimization (MEO) and convergence depth control (CDC) are presented to enable fast and flexible convergence. A reduced-space barrier algorithm is implemented to take advantage of the features of process optimization and deal with rank deficient or inconsistent systems. Compatibility of ASPEN PLUS for CAPE-OPEN (CO) solvers is extended so that CO compliant NLP solvers are available to this popular process simulator. In view that performance of NLP solvers are sometimes significantly influenced by their options/parameters, parameter auto-tuning (PAT) method is developed to improve their performance especially for hard problems and time-critical applications.

Performance of the proposed strategies is demonstrated through solving chemical process simulation, optimization and control problems, including simulation and optimization of large-scale PTA system, optimization and control of high-temperature gas-cooled reactor (HTR), distillation columns, air separation systems, etc.