

# Advanced HVAC Control

Energoklastr, Czech Technical University in Prague and CVVI present workshop and conference on "Advanced HVAC Control"

September 13-17, 2010

# Prague

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Prague, August 13, 2010

## Advanced HVAC Control 2010

The Organizing Committee is pleased to invite you to participate in the Advanced HVAC Control conference and workshop, focused on predictive control, energy savings and building automation, to be held September 13-17, 2010, in Prague. The conference and workshop are being organized by Energoklastr and Czech Technical University in Prague (CTU).

The conference will feature lectures by renown European experts from ETH Zürich, KU Leuven and CTU Prague, world renown universities that represent top research facilities, not only in the area of building automation.

The conference aims to present the research activities in the Czech Republic in the area of energy savings, control methods and building automation, and to illustrate the application challenges in architecture and construction. We believe that the experiences gained from running projects and open discussion will be interesting for researchers, practitioners, public and media.

The first two days will be dedicated to lectures focused on advanced methods of building automation. The conference on Wednesday is open for all public. It will feature presentations and panel discussion, which should outline interesting topics in research, development and application of said methods in already running projects. The information from the lectures and from the conference can be further developed during the workshop on Thursday and Friday.

For more information about the conference or registration, please contact our Organizing Committee by e-mail ([konference@energoklastr.cz](mailto:konference@energoklastr.cz)).

We are looking forward to seeing you in Prague!

JUDr. Jan Rakušan, MBA  
head of the executive board

Ing. Lukáš Ferkl, Ph.D.  
member of the executive board for R&D

# Programme at a glance

## Conference on advanced HVAC control (in English and Czech)

Wednesday, 9/15, Clarion Hotel, Freyova 33, Praha 9

- Opening speech by prof. Boris Šimák, dean of FEE CTU in Prague
- World and European trends in advanced building control and automation
- Experiences with implementation of technological innovations from customer's perspective
- Intelligent buildings in the Czech Republic – implementation experiences
- Financing of intelligent buildings projects
- Presentation and discussion participants come KU Leuven, ETH Zürich, CTU in Prague and Energoklastr

## Technical part – workshop

Monday, 9/13, CTU in Prague, Technická 2, Praha 6

- Physical properties of buildings and their modelling (Lieve Helsen, KU Leuven)
- Statistical modelling of buildings (Lukáš Ferkl, CTU in Prague)

Tuesday, 9/14, CTU in Prague, Technická 2, Praha 6

- Predictive control of buildings – general overview (Dimitrios Gyalistras, ETH Zürich)
- Predictive control of buildings – special applications (Frauke Oldewurtel, ETH Zürich)
- Building instrumentation (Pavel Burget, CTU in Prague)

Thursday and Friday, 9/16-17, CTU in Prague, Technická 2, Praha 6

Workshops for participants under the supervision of the lecturers – three groups of interest:

- Modelling of buildings as a basis for control
- Model predictive control
- Instrumentation of intelligent buildings

## Registration

More information and registration forms can be found on [www.hvac2010.cz](http://www.hvac2010.cz) or can be requested via e-mail [konference@energoklastr.cz](mailto:konference@energoklastr.cz).

The Monday and Tuesday lectures are free of charge after registration. Conference fee (Wednesday, Clarion Hotel) is CZK 2500 (ca. EUR 100, coffee, snack and lunch are included). Workshop fee for the entire programme is CZK 5000 (ca. EUR 200, coffee, snack and lunch included). Students have a 50% discount.

# Technical part programme

## Building systems modelling

Majority of modern control and measurement systems is based on the knowledge of the system model to be controlled. Thanks to this mathematical and physical description, we can predict the evolution of the system in time and optimize the control based upon this estimation. In the case of the buildings, this means that based upon the mathematical description of e.g. heating, we can use the mathematical formulae to estimate the future energy consumption, but also the influence of weather, so the thermal accumulation of the building can be exploited to find hidden energy savings potential.

However, modelling of buildings suitable for control purposes is a difficult task in general and appropriate mathematical models exist no more than last few years.

During the Advanced HVAC Control conference, modelling of buildings will be presented by participants from KU Leuven (Belgium) Lieve Helsen and Clara Verhelst, statistical modelling methods will be presented by Lukáš Ferkl (CTU in Prague).

## Predictive control

Model-based Predictive Control (MPC) is one of the most favourite methods for multidimensional systems control. It originated from the needs of oil industry in 1970's and experienced a significant progress since then. Various modifications of MPC can be found e.g. in oil refineries, chemical plants, but also in ESP systems of vehicles.

MPC applications in buildings will be presented by Dimitrios Gyalistras a Frauke Oldewurtel from ETH Zürich (Switzerland), world's leading institute in the field of automation.

## Instrumentation

Sensors, actuators and industrial automata make an integral part of control systems used in building automation. Low prices and high technological level of these components allows us to create truly "intelligent" houses. Sophisticated automation enables us to achieve high level of comfort and save energy at the same time.

During the Advanced HVAC Control workshop and conference, instrumentation of intelligent buildings will be presented by Pavel Burget from CTU in Prague.

