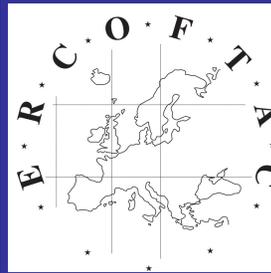


Registration

www.ercoftac.org



Uncertainty Management and Quantification in Industrial Analysis and Design

www.ercoftac.org

Location

Crowne Plaza Hotel
Hampton -Marina, Virginia
USA



Course fees

\$ 1150 USD

This fee includes: course registration, course material, lunch, refreshments and course dinner. Please note that accommodation is not included in this fee.

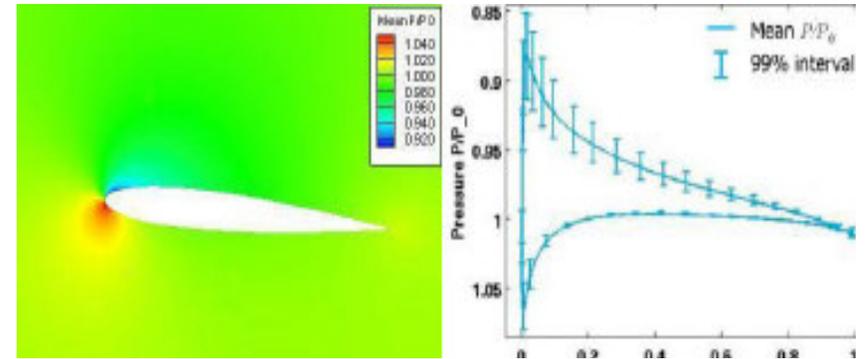
Hotel booking

Crowne Plaza Hotel : Room discount, \$77 plus tax / night
Offer open until 24th August 2011

Registration

For further information

<http://www.nianet.org/Uqshortcourse/index.aspx>



Course Coordinator: Prof. Charles Hirsch

15-16 September 2011
Crowne Plaza Hotel
Hampton-Marina, Virginia, USA

Information

ERCOFTAC, a leader in applied fluid mechanics, is proud to announce a two day awareness course on '*Uncertainty Management and Quantification in Industrial Analysis and Design*'.

Uncertainty quantification is a new paradigm in industrial analysis and design as it aims at taking into account the presence of numerous uncertainties affecting the behavior of physical systems. Dominating uncertainties can be either be operational (such as boundary conditions) and/or geometrical resulting from unknown properties, such as tip clearances of rotating compressor blades or from manufacturing tolerances.

Whether bringing a new product from conception into production or operating complex plant and production processes, commercial success rests on careful management and control of risk in the face of many interacting uncertainties. For example a new aircraft or aero-engine must be designed and engineered within a given time frame and budget to meet a given set of performance requirements, and then manufactured at unit cost and rates that meet an overall business plan. Today's fiercely competitive market and increasingly stringent regulatory environment is such that there is very little margin of error. Failure to appreciate, understand and appropriately manage risks inevitably results in severe financial penalties, and even irrevocable damage to reputation.

Historically, chief engineers and project managers have estimated and managed risk using mostly human judgment founded upon years of experience and heritage. As the 21st century begins to unfold, the design and engineering of products as well as the control of plant and process are increasingly relying on computer models and simulation. This era of virtual design and engineering opens the opportunity to deal with uncertainty in a systematic formal way by which sensitivities to various uncertainties can be quantified and understood, and designs and processes optimized so as to be robust against such uncertainties. Human judgment will always play an important role, but leading companies in many fields of engineering are increasingly aware of these possibilities and uncertainty quantification is beginning to feature strongly in their strategic aspirations. Thus this is a very opportune moment to introduce a two- day awareness course on this emerging topic. The aim is to share the aspirations and requirements of leading companies in the fields of aerospace, energy, transport and chemical process; review emerging methods and techniques and how these are being deployed; and define the current state-of-the-art and map out-near term future possibilities.

Speakers

Prof. Charles Hirsch, Numeca International, Belgium
Prof. Anthony Hutton, ERCOFTAC, UK
Dr. Alberto Pasanisi, EDF, France
Dr. Bernhard Eisfeld, DLR, Germany
Dr. Jacques Peter, ONERA, France
Dr. Gilbert Roge, Dassault Aviation, France
Dr. Alain Dervieux, INRIA, France
Dr. Thomas Zang, NASA Langley Research Centre, USA
Dr. Andrew Booker, The Boeing Company, USA
Prof. George Karniadakis, Brown University, USA
Dr. Karl Alexander, RR, USA

Programme

Thursday 15 Sep 2011

Industry Requirements and Objectives for Uncertainty Quantification (UQ) and Risk Reduction by Robust Design

9:00	Requirements for UQ from Aircraft Industry	<i>Dr. G. Roge</i>
9:45	Robust Engineering - Basics, Case Studies and Requirements for UQ	<i>Dr. A. Karl</i>
10:30	Refreshments	
10:45	UQ in Simulation at EDF: Stakes, Methods, Tools and Examples	<i>Dr. A. Pasanisi</i>
	Methodologies for UQ and for Robust Design Under Uncertainties	
11:30	Generalised Polynomial Chaos and its Extensions	<i>Prof. G. Karniadakis</i>
12:15	Lunch	
13:15	Numerical Uncertainties and Error Control: The MUNA project	<i>Prof. B. Eisfeld</i>
14:00	Long-Time Integration and High Dimensions	<i>Prof. G. Karniadakis</i>
14:45	Non-Intrusive UQ Methods with Apps to Turbomachinery and A/C Flows	<i>Dr. J. Peter</i>
15:30	Refreshments	
15:45	Sensitivity Analysis by Adjoint: Automatic Differentiation and Application	<i>Dr. A. Dervieux</i>
16:30	Q & A	

Friday 16 Sep 2011

Examples of Applications and Test Cases with Prescribed Uncertainties

9:15	Formal Guidance and State-of-Practice in UQ Mgmt at NASA	<i>Dr. T. Zang</i>
10:00	Lessons Learned from the NODESIM Project	<i>Prof. C. Hirsch</i>
10:45	Refreshments	
11:00	Uncertainty Quantification and Optimization Under Uncertainty: Experience and Challenges	<i>Dr. A. Booker</i>
12:00	Present State of the Art and Outlook for The Next Technology Readiness (TR) , Including an Introduction to a Best Practice Guide for UQ	<i>Prof. A. Hutton</i>
13:00	Lunch	
14:00	Round table discussion - Open Forum.	<i>All Speakers</i>
	Close	