SESO 2014

International Thematic Week
"Smart Energy and Stochastic Optimization"

Program   June 23 to 27, 2014

I. Monday 23 June at ENSTA ParisTech.
Course on Stochastic Optimization by Roger J-B Wets (UC Davis, USA)
"Stochastic Programming and Progressive Hedging".

II. Tuesday 24 June 2014 at ENSTA ParisTech.
Scientific Workshop on Stochastic Optimization:
"Stochastic Methods for Large-Scale Optimization".

III. Wednesday 25 June 2014 at École des Ponts ParisTech.
PhD defense of Vincent Leclère (UPE):
"Contributions to Decomposition Methods in Stochastic Optimization".

IV. Thursday 26 June 2014 at École des Ponts ParisTech.
Industry Day:
"New challenges for optimization in energy".

V. Friday 27 June 2014 at École des Ponts ParisTech.
Scientific Workshop on Statistics:
"Statistics for Stochastic Optimization".

ENSTA ParisTech, Palaiseau, France

Monday 23 June 2014:

Course on Stochastic Optimization

Title: "*Stochastic Programming and Progressive Hedging*"

Location: Room R112

Planning:

14:00 – 15:30 "*A short introduction to stochastic programming models*"
Roger J-B Wets (UC Davis, USA)

Nearly all decision models involve uncertainty about some of the parameters of the problem. In a wide variety of instances, this uncertainty can be formulated in probabilistic (statistical) terms and, often, this leads a stochastic programming formulation of the decision model. This lecture will be concerned with the major implications: contrasting deterministic and stochastic programming formulations and the alternatives the decision maker might consider when setting up the model. Some elementary, but basic properties of stochastic programming problems will be examined.

15:30 – 16:00 **Coffee break**

16:00 – 17:30 "*An aggregation principle in stochastic programming*"
Roger J-B Wets (UC Davis, USA)

Solving stochastic programming problems, in some way or another requires that the algorithmic procedures take into account all possible (uncertain future) events that might occur. This immediately results in a complex, large scale problem and the design of algorithmic procedures must necessarily rely on a decomposition of some type. The "Progressive Hedging" algorithm relies on a "per event" decomposition that allows us to obtain a global solution but never requires solving (repeatedly) subproblems that aren't any larger than a deterministic version, i.e., involving just a single event. Implementation allows for a variety of strategies and raises a number of issues.

Abbreviated biography of Roger J-B Wets

Roger Wets is a Distinguished Research Professor of Mathematics at the University of California, Davis. He guided nineteen students to their Ph.D. His main research interests have been stochastic optimization and variational analysis. For this work he has received a number of prizes that include Guggenheim and Erskine Fellowships, the SIAM-MPS Dantzig Prize in Mathematical programming and the INFORMS Lanchester prize for the book "Variational Analysis" that he co-authored with R.T. Rockafellar.

During the last decade his research has been focused on equilibrium problems, in particular equilibrium problems in a stochastic environment, and on nonparametric estimation, in particular on the fusion of hard and soft information. Over time, he has been associated with the Boeing Scientific Research Labs, the International Institute of Applied Systems Analysis (Laxenburg, Austria), the IBM-T.J. Watson Research Center (Yorktown Heights, N.Y.), the Center for Mathematical Modeling of the University of Chile and the World Bank. This resulted in getting involved in projects related to aerospace, telecommunications, finance, soil management and water resources, manufacturing and energy. He has published about 200 technical articles, mostly in pure and applied mathematical journals, but also in journals dealing with probability, statistics, economics and ecology. He held, or holds, editorial positions on a number of leading journals in mathematics and operations research.

ENSTA ParisTech, Palaiseau, France

Tuesday 24 June 2014:

Scientific Workshop on Stochastic Optimization

Title: **"Stochastic Methods for Large-Scale Optimization"**

Location: Room R112

Planning:

09:00 – 09:30 **Welcome**

09:30 – 09:45 Introduction by ENSTA ParisTech and PGMO

09:45 – 10:30 **"Stochastic Decomposition Procedure for Electricity Markets"**
Nicolas Grébille (INRIA-Saclay and EDF R&D)

10:30 – 11:15 **"Risk Neutral and Risk Averse Multistage Stochastic Programming"**
Alexander Shapiro (Georgia Tech, USA)

11:15 – 12:00 **"Theoretical and Practical Questions in Stochastic Decomposition"**
Vincent Leclere (Cermics, ENPC)

12:00 – 14:00 **Lunch**

14:00 – 14:45 **"Space Decentralization and Primal-Dual Technics for Stochastic Optimal Control"**
Philippe Mahey (ISIMA, Clermont-Ferrand)

14:45 – 15:30 **"Attenuation of the curse of dimensionality in optimal control by max-plus methods"**
Stephane Gaubert (INRIA-Saclay)

15:30 – 16:00 **Coffee break**

16:00 – 16:45 **"Toward Scalable Stochastic Unit Commitment"**
David Woodruff (UC Davis, USA)

16:45 – 17:30 **"Minimizing Risk Measures on Paths in Graphs"**
Axel Parmentier (Cermics, ENPC)