



Stochastic Methods for the Analysis of NUMerical COdes

Research group sponsored by the
French National Center for Scientific Research



MASCOT NUM aims at **coordinating research efforts** in developing tools for design, modeling and analysis of computer experiments.

Many techniques of **applied mathematics** involved : statistics, probability, computer science, numerical analysis, operational research, mathematical physics, ...

Key milestones for MASCOT NUM :

- ★ February 2006, first "non official" meeting in Toulouse;
- ★ January 2008, birth of MASCOT NUM;
- ★ January 2012, first renewal of the group;
- ★ January 2016 remains an open issue ...

An increasing number of registered members (365 persons receive the diffusion letters in 2013) !

Officers, Board and Council of MASCOT NUM

Board (group leaders, webmasters)

- Mark Asch (Université de Picardie),
- Sébastien Da Veiga (IFPEnergiesnouvelles, Rueil-Malmaison),
- Bertrand Iooss (EDF R&D, Chatou),
- Fabien Mangeant (EADS Innovation Works),
- Amandine Marrel (CEA Cadarache),
- Hervé Monod (INRA Jouy-en-Josas, Département MIA),
- Anthony Nouy (Ecole Centrale de Nantes),
- Clémentine Prieur (Université Grenoble, LJK/MOISE),
- Luc Pronzato (I3S, CNRS Sophia Antipolis),
- Olivier Roustant (Ecole des Mines de Saint Etienne),
- Nathalie Villa-Vialaneix (Université de Perpignan, et Paris 1),
- François Wahl (IFPEnergiesnouvelles, Solaize).

Webmasters

- Julien Bect (SUPELEC, Gif sur Yvette),
- Alexandre Janon (Univ. de Grenoble → Univ. Paris 11).

Scientific council

- Jean-Marc Azaïs (Université Toulouse 3),
- Gérard Biau (Université Paris VI),
- Pierre Del Moral (INRIA Bordeaux-Sud Ouest),
- Fabrice Gamboa (Université Toulouse 3),
- Josselin Garnier (Université Paris VII),
- Olivier Le Maître (LIMSI, CNRS),
- Clémentine Prieur (Univ. Grenoble, LJK/MOISE),
- Luc Pronzato (I3S, CNRS Sophia Antipolis),
- Christophe Prud'homme (Univ. Strasbourg),
- Bruno Sudret (ETH Zürich),
- Emmanuel Vazquez (SUPELEC, Gif sur Yvette).

MASCOT NUM's partners are public institutions, public labs and companies.

The complete list is available at

<http://www.gdr-mascotnum.fr/committees.html>

Get involved : MASCOT NUM has created a club for industrials. For more information you can meet B. looss and C. Prieur on tuesday during the *welcome cocktail*.

MASCOT NUM members, Keep Your Blog active !

<http://mascot-num.blogspot.fr/>

MASCOT NUM is composed with 7 working groups. These groups regularly organize some thematic days, special issues, summer schools, ...

Working groups

- **Design of numerical experiments** Luc Pronzato & Emmanuel Vazquez
- **Uncertainty and sensitivity analyses** Fabrice Gamboa & Bruno Sudret
- **Computer code approximation via metamodels** Anthony Nouy & Josselin Garnier
- **Probabilistic models** Erick Herbin & Ahmed Kebaier
- **Industrial problems** Fabien Mangeant & Mark Asch
- **Environmental problems** Clémentine Prieur & Hervé Monod
- **Software aspects** Christophe Prud'homme & Anne Dutfoy

You can put a link to publications of interest for MASCOT NUM users on the following page

<http://www.gdr-mascotnum.fr/documents.html>

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Note that on HAL <http://hal.archives-ouvertes.fr/> you can choose the **GdR MASCOT-NUM** affiliation. You can choose several affiliations.

Upcoming MASCOT NUM and related events :

- Ninth IMACS Seminar on **Monte Carlo Methods**, Annecy-le-Vieux July 15-19,
- CEMRACS 2013, CIRM Marseille July 22- August 30
<http://smai.emath.fr/cemracs/cemracs13/>
Modelling and simulation of complex systems : stochastic and deterministic approaches,
- MASCOT NUM's thematic day, IHP Paris November 13
Computer code validation & verification,
- MASCOT NUM 2014 ETH Zürich April, 23-25,
- Spring school ASPEN 2014 Sensitivity analysis, uncertainty quantification and numerical models exploration in environmental science, May 4-9 Ecole de Physique des Houches,
- SIAM UQ 2014 Savannah, Georgia March 31- April 3,
- MCQMC14 KULeuven April, 6-11,



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Ph.D. students day

09h30-10h30 Invited speaker : J. **Blum** (University of Nice, France):
Back and forth nudging for data assimilation in geophysics.

10h30-11h00 Coffee break

11h00-12h30

- F. Bachoc (CEA/University Paris VII, France), Maximum likelihood and cross validation for kriging hyper-parameters estimation,
- M. Ivanov (University Dortmund, Germany), Parallel optimization based on FANOVA graph decomposition,
- L. Le Gratiet (CEA/University Paris VII, France), Asymptotic analysis of the learning curve for Gaussian process regression with noisy observations.

12h30-14h00 Lunch break

14h00-15h00 Poster session

15h00-16h00

- C. Chevalier (University Bern, Switzerland), Sequential and batch-sequential Bayesian sampling strategies for the identification of an excursion set,
- M. Jala (Telecom ParisTech, France), Sequential design of experiments for numerical dosimetry.

16h00-16h30 Coffee break

16h30-18h00

- G. Chastaing (University of Grenoble, France), Generalized Sobol sensitivity indices for dependent variables,
- P. Rai (Ecole Centrale Nantes, France), A regression based method using sparse low rank approximations for uncertainty propagation,
- J. Fruth (University Dortmund, Germany), Sensitivity analysis for functional inputs in a sheet metal forming process.

A prize of 1000 € will be conferred by the MASCOT NUM's scientific council to the best student communication !

Good luck and ... have a nice meeting :-)