

Nicolas Gilardi

Birth: 5th of July 1975.
Nationality: French.
Languages: French (native), English (fluent), Spanish (fair).
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Education & Diplomas

1999 – 2002: Ph.D. Thesis on *Machine Learning Algorithms for Spatial Data Analysis*.
University of Lausanne and IDIAP Research Institute, Switzerland.
1997 – 1998: Diploma (DESS) in Automated Systems.
Systems and Software Institute (IDLS), University of Bordeaux, Bidart, France.
1993 – 1997: Master in Electronics, Electrotechnics and Automatics.
University of Rennes, France.

Professional Activities

Since 02/2007 : Research and software engineer for a data analysis software for cancer diagnosis. French Atomic Energy Commission, Saclay, France.
08/2004 – 09/2006: Research assistant on the Conditions Database for CERN-LHCb experiment. Particle Physics Experiment group, University of Edinburgh, UK.
02/2003 – 07/2004: Post Doc researcher for *Advanced Methods in Data Analysis* project. French Institute of Petroleum, Rueil-Malmaison, France.
03/1999 – 06/2002: System manager (WinNT) of Earth Sciences Section. University of Lausanne, Lausanne, Switzerland.
06/2001 – 10/2001: Part time scientific collaborator on an image analysis project. Association for promoting Innovations and Technologies, Yverdon, Switzerland.
06/1998 – 12/1998: Software Engineer for a CAO software module of electric circuit simulation. Algo'Tech Informatique, Bidart, France.

Research Experience

French Institute for Petroleum:

Activities: Uncertainty estimation in modeling; meta modeling for expensive simulations; input factors selection for MLP; design of experiment for MLP.
Methods: Bootstrap, Active Learning; MLP, Splines.
Tools: Matlab + NetLab.
Applications: Dynamic fluid composition estimation; meta modeling of a fuel ignition simulator; optimisation of car motor fuel consumption.
Publications: 2 conference papers.

University of Lausanne & IDIAP Research Institute:

Activities: Comparison of Geostatistics and Machine Learning for spatial data analysis.
Methods: SVM, MLP, Kernel Ridge Regression, Confidence Machines, Mixture of Gaussians; Ordinary Kriging, Indicator Kriging, Sequential Gaussian Simulations.
Tools: RHUL and Torch libraries; Geostat Office, Variowin, Gstat.
Applications: Analysis of Lemman Lake sediments; estimation of daily rainfall over Switzerland (SIC97); toy examples using digital elevation models.
Publications: Ph.D. Thesis; 1 journal article; 7 conference papers; 1 book chapter.

Professional Experience

University of Edinburgh & CERN

Context: Large scientific collaboration (about 600 collaborators in more than 40 institutes); work mostly independent or in small groups.

Activities: Development of a graphical interface for the LHCb conditions database management; organisation of users/developers meetings; development and usage of a test suite for database deployment and usage on the GRID; tutorials and documentation for end users; some web development.

Tools: languages: python, C++; libraries: Qt, Gaudi; OS: Linux, WinXP; DBMS: Oracle, SQLite, MySQL.

French Institute for Petroleum

Context: Large research institute with a wide range of research activities (geology, chemistry, mechanics, etc.); work in small teams; participation to an industrial research consortium.

Activities: Applied research (cf. Research Experience paragraph).

Tools: languages: Matlab; libraries: NetLab; OS: Win2000.

University of Lausanne

Context: Earth Science institute of the University; work alone or with a partner.

Activities: system manager for the Earth Science network; installation and maintenance of computers and software for research and education.

Tools: OS: WinNT, Win2000, Linux.

Association for promoting Innovations and Technologies

Context: Innovation centre close to an engineering school; work with a small group of engineers and small companies.

Activities: scientific consultant for an industrial application of pattern recognition.

Tools: languages: Matlab, C++.

Algotech Informatique

Context: small CAO company; work in small team.

Activities: software engineer; development of an electric circuit simulation module for a CAO software.

Tools: language: Delphi, C++; OS: Win95.

Research Interests

- development of applied Machine Learning methods and algorithms for scientific data analysis
- statistical approximation of complex physical models for resources critical applications
- design of experiments for non linear statistical models
- environmental risk mapping
- artificial intelligence for computer games (strategic planing and character behavior simulation)

Personal Interests

- Sciences in general, and Astronomy in particular.
- Sports (badminton, fencing, trekking, horse ridding).
- Strategy and role playing games (either on board or on computer).
- European comics and cinema.

List of Publications

Journal Articles

- **Local Machine Learning Model for Spatial Data Analysis.** N. Gilardi and S. Bengio. *Journal of Geographic Information and Decision Analysis*, Vol. 4, n°1, 2000.

Conference Publications

- **LHCb Conditions Database.** M. Clemencic and N. Gilardi. *Computing in High Energy and Nuclear Physics*, 2006.

- **Design of Experiments by Committee of Neural Networks.** N. Gilardi and A. Faraj. *International Joint Conference on Neural Networks*, 2004.

- **Plans d'Expérience par Comités de Modèles Neuronaux.** N. Gilardi, A. Faraj. *XXXVIèmes Journées de Statistique de la SFdS*, 2004.

- **Conditional Gaussian Mixture Models for Environmental Risk Mapping.** N. Gilardi, S. Bengio and M. Kanevski. *Neural Networks for Signal Processing*, 2002.

- **Confidence Evaluation for Risk Prediction.** N. Gilardi, T. Melluish and M. Maignan. *Conference of the International Association for Mathematical Geology*, 2001.

- **Une Approche Transductive pour la Cartographie de Risque Environnemental.** N. Gilardi and T. Melluish. *XXXIIIèmes Journées de Statistique de la SFdS*, 2001.

- **Support Vector Regression for Environmental Prediction.** N. Gilardi and G. Dubois. *European Conference on Geostatistics for Environmental Applications*, 2000.

- **Applications de Méthodes d'Apprentissage pour l'Etude des Risques de Pollution dans le Lac Léman.** N. Gilardi, A. Gammerman, M. Kanevski, M. Maignan, T. Melluish, C. Saunders and V. Vovk. *Colloque CLUSE sur les Risques Majeurs*, 2000.

- **Spatial Data Classification with Support Vector Machines.** N. Gilardi, M. Kanevski, M. Maignan and E. Mayoraz. *Geostat 2000 Congress*, 2000.

- **Environmental and Pollution Spatial Data Classification with Support Vector Machines and Geostatistics.** N. Gilardi, M. Kanevski, M. Maignan and E. Mayoraz. *Advanced Course on Artificial Intelligence*, 1999.

- **Decision-Oriented Environmental Mapping with Radial Basis Function Neural Networks.** V. Demyanov, N. Gilardi, M. Kanevski, M. Maignan and V. Polishchuk. *Advanced Course on Artificial Intelligence*, 1999.

Book Chapters

- **Machine Learning for automatic environmental mapping: when and how?** N. Gilardi and S. Bengio. In G. Dubois, editor, *Automatic mapping algorithms for routine and emergency monitoring data. Report on the Spatial Interpolation Comparison (SIC2004) exercise*, pages 123-138. Office for Official Publications of the European Communities, Luxembourg, 2005.

- **Comparison of four machine learning algorithms for spatial data analysis.** N. Gilardi and S. Bengio. In G. Dubois, J. Malczewski and M. DeCort, editors, *Mapping radioactivity in the environment – Spatial Interpolation Comparison 97*, pages 222-237. Office for Official Publications of the European Communities, Luxembourg, 2003.

References

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