

Nicolas Gilardi

Birth: 5th of July 1975.
Nationality: French.
Languages: French (native), English (fluent), Spanish (fair).
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Professional project

I'm looking for a position allowing me to collaborate with “field workers” (experimental scientists, medical teams, etc.) and assist them in their data acquisition and interpretation.

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 11/2008:** Research engineer and software developer for the uncertainty analysis platform URANIE. **Nuclear Energy Division** of the **French Atomic Energy Commission (CEA-DEN)**, Saclay, France.
02/2007 – 07/2008: Research and software engineer for a data analysis software evaluating prostate cancer risk (Human Diag project). **Technological Research Division** of the **French Atomic Energy Commission (CEA-DRT)**, 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 (IFP)**, 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. **Algotech Informatique**, Bidart, France.

Other Experience

- 02/2011 – 11/2011:** three months formation on the **CEA** research activities, especially regarding nuclear energy production.
11/2010 – 12/2010: computer scientist of the archeological team of the third **Makay Nature** scientific expedition, in Madagascar.
09/2009 – 04/2010: member of a committee for the french association **Rencontre au Bout du Monde**, financing development projects via tourism.

Research Experience

CEA-DEN:

Activities: Uncertainty propagation, random data generation, optimisation.
Methods: Sobol indices, Monte Carlo sampling, genetic algorithms, gradient methods.
Tools: URANIE, ROOT, C++, Python.
Applications: nuclear physics, thermo-hydraulics.

CEA-DRT:

Activities: Bioinformatics, variable selection, missing data problems.
Methods: MLP, SVM, logistic regression, genetic algorithm, mutual information.
Tools: Matlab, Python.
Applications: Cancer prevention, diagnosis and treatment; decision making tools.

IFP:

Activities: Uncertainty estimation, meta modeling, variable selection, design of experiment.
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.

University of Lausanne & IDIAP Research Institute:

Activities: Comparison of Geostatistics and Machine Learning for spatial data analysis.
Methods: SVM, MLP, 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; Spatial Interpolation Comparison 1997 (SIC97); toy examples using digital elevation models.

Professional Experience

CEA-DEN

- Context:** Small research and development team with many collaborations with other laboratories. Objective is to develop the URANIE platform and assist the users.
- Activities:** Develop and integrate new algorithms in the URANIE platform; answer to users' needs; provide formation for future users of the platform; assist other researchers on data analysis and uncertainty propagation problems.
- Tools:** Languages: Python, C++; libraries: ROOT; OS: Linux;

CEA-DRT

- Context:** Small research team with close collaboration with an external medical group. Objective was to launch a startup to exploit the results of the research.
- Activities:** Analysis of medical databases (clinic and genetic) for evaluation of cancer risk and treatment efficiency. Implementation of decision making softwares for physicians. Discussions on new strategies for data taking procedures.
- Tools:** Languages: Python; libraries: wxPython, numpy; OS: WinXP, Linux;

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 user interfaces for the LHCb conditions database management;
- Tools:** Languages: Python, C++. Libraries: Qt, Gaudi. OS: Linux GRID, 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; heterogeneous network of a hundred computers with a majority of "non computer friendly" users; work alone or with a partner.
- Activities:** system manager for the Earth Science network; user support, 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 linked 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:** Languages: Delphi, C++. OS: Win95.

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.

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.

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.

References

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