Curriculum Vitae of Laura Azzimonti

Personal information

Name	**Laura Azzimonti**
Address	Galleria 1, CH-6928 Manno, Switzerland
Email	laura.azzimonti@supsi.ch
Nationality	Italian
Date of birth	1 December 1985

Current position

Dates	from September 2017
Position	**Lecturer - Researcher at IDSIA, "Dalle Molle" Institute for Artificial Intelligence**
Name of organization	Department of Innovative Technologies - SUPSI, University of Applied Sciences of Southern Switzerland

Previous positions

Dates	February 2015 – August 2017
Position	**Researcher at IDSIA, "Dalle Molle" Institute for Artificial Intelligence**
Name of organization	Department of Innovative Technologies - SUPSI, University of Applied Sciences of Southern Switzerland
Dates	January 2014 – January 2015
Position	**Research Specialist Engineer** at MOXOFF srl, Milano, Italy
Duties	Development and software implementation of mathematical and computational methods for data analysis, signal processing and task optimization for customers in different business areas, including electronics, biomedicine, automotive, transport, ecology. Management of team work and relations with clients, including formulation of commercial offers and technical meetings.
Dates	January 2013 – January 2014
Position	**Post-doctoral fellowship researcher** at MOX – Department of Mathematics, Politecnico di Milano, Italy
Research project	"Advanced statistical and numerical models and methods for the analysis of functional and spatial data, with applications in life sciences and engineering"
Duties	Research in the field of non-parametric surface estimation methods and numerical optimization of partial differential equations, in particular development of numerical methods for data assimilation in boundary value problems. Software implementation and application to relevant biomedical studies. Study of the random properties, such as accuracy and precision, of estimated stochastic fields. Divulgation of results by public keynotes at international conferences and by technical, peer-reviewed publications.

Teaching

Dates	September 2017 – June 2018
Position	**Lecturer**, *Calculus* for Engineering at SUPSI
Duties	Teaching lessons and exercise lessons. Preparation of teaching material, including formulation of exercises and preparation of exams.
Dates	September 2016 – June 2017
Position	**Lecturer**, *Pre-calculus* and *Calculus* for Engineering at SUPSI

Duties	Teaching lessons and exercise lessons. Preparation of teaching material, including formulation of exercises and preparation of exams.
Dates	20 May 2016
Position	**Lecturer**, *Machine Learning - Workshop on Data Mining and Big Data* in collaboration with Fondazione AGIRE
Dates	September 2015 – February 2016
Position	**Lecturer**, *Data Mining for Business Intelligence* for Management Engineering at SUPSI
Duties	Teaching lessons and practical lessons. Preparation of teaching material, including formulation of exercises and preparation of exams.
Dates	September 2015 – July 2016
Position	**Lecturer**, *Pre-calculus* and *Calculus* for Management Engineering at SUPSI
Duties	Teaching lessons and exercise lessons. Preparation of teaching material, including formulation of exercises and preparation of exams.
Dates	March – July 2011 and 2013
Position	**Teaching Assistant**, *Statistics* for Mechanical Engineering (English language) and Energy Engineering at Politecnico di Milano
Duties	Teaching exercise and laboratory lessons. Preparation of teaching material, including formulation of exercises and preparation of exams.

Internship

October 2013	"Scientific computing and uncertainty quantification" group (prof. Fabio Nobile), Department of Mathematics, EPFL, Lausanne.
April-July 2012	"Scientific computing and uncertainty quantification" group (prof. Fabio Nobile), Department of Mathematics, EPFL, Lausanne.

Education

Dates	January 2010 – December 2012
Name and type of organization	Politecnico di Milano
Title of qualification awarded	**PhD in Mathematical Models and Methods in Engineering**
Grade	Doctor Europaeus certification with merit.
Title of Thesis	"Blood flow velocity field estimation via spatial regression with PDE penalization" http://hdl.handle.net/10589/76565
Dates	September 2007 – December 2009
Name and type of organization	Politecnico di Milano
Title of qualification awarded	**Master's Degree in Mathematical Engineering, Specialization Scientific Computing and Statistics.**
Grade	110/110 cum laude.
Title of Thesis	"Modelli a effetti misti: teoria e applicazioni a dati longitudinali in ambito biologico" (" Mixed effects models: theory and applications to longitudinal biological data") Thesis developed at the Laboratory of Modeling and Scientific Computing (MOX) of the Department of Mathematics - Politecnico di Milano in collaboration with San Raffaele Hospital, Milano
Dates	September 2004 – September 2007
Name and type of organization	Politecnico di Milano
Title of qualification awarded	**Bachelor's Degree in Mathematical Engineering, Specialization Scientific Computing.**
Grade	110/110 cum laude.

Title of Thesis	"Sistemi di urne interagenti e teoria dei valori estremi applicati alla modellizzazione della crescita tumorale: teoria e simulazioni" ("Interacting urn systems and extreme value theory for modeling tumor growth: theory and simulations")
Dates	1999–2004
Name and type of organization	Liceo Scientifico Arturo Tosi, linguistic specialization, Busto Arsizio
Title of qualification awarded	**Maturità Scientifica.**
Grade	100/100 cum laude

Research Topics

current	Bayesian Networks, non parametric statistics, imprecise probabilities, big data analysis, stochastic PDE, Kalman filter.
past	Mathematical and statistical modeling, numerical analysis, statistics, data mining, analysis of complex and high dimensional data, spatial statistics, analysis of repeated measures and longitudinal data, design of experiments, scientific computing, Finite Elements computing, computational fluid dynamics, data assimilation, inverse problems, PDE optimal theory, parallel computing.

Publications

2017

- L. Azzimonti, G. Corani, M. Zaffalon: "Hierarchical Multinomial-Dirichlet model for the estimation of conditional probability tables" to appear in "2017 IEEE 17th International Conference on Data Mining (ICDM)", 2017.

- F. Gorini, L. Azzimonti, G. Delfanti, L. Scarfó, C. Scielzo, M.T. Bertilaccio, P. Ranghetti, A. Gulino, C. Doglioni, A. Di Napoli, M. Capri, C. Franceschi, F. Calligaris-Cappio, P. Ghia, M. Bellone, P. Dellabona, G. Casorati, C. de Lalla: "Invariant NKT cells contribute to Chronic Lymphocytic Leukemia surveillance and prognosis", Blood, vol. 129, no. 26, 3440-3451, 2017. http://www.bloodjournal.org/content/129/26/3440

- C. Cruder, D. Falla, F. Mangili, L. Azzimonti, L.S. Araùjo, A. Williamon, M. Barbero: "Profiling the location and extent of musicians' pain using digital pain drawings", Pain Practice, 2017. http://dx.doi.org/10.1111/papr.12581

2016

- B. Guerciotti, C. Vergara, L. Azzimonti, L. Forzenigo, A. Buora, P. Biondetti, M. Domanin: "Computational study of the fluid-dynamics in carotids before and after endarterectomy", Journal of Biomechanics, vol. 49, 26–38, 2016. https://doi.org/10.1016/j.jbiomech.2015.11.009

2015

- L. Azzimonti, L.M. Sangalli, P. Secchi, M. Domanin, F. Nobile: "Blood flow velocity field estimation via spatial regression with PDE penalization", Journal of the American Statistical Association, Theory and Methods Section, vol. 110, no. 511, 1057–1071, 2015.

http://amstat.tandfonline.com/doi/abs/10.1080/01621459.2014.946036

2014

- L. Azzimonti, F. Nobile, L.M. Sangalli, P. Secchi: "Mixed finite elements for spatial regression with PDE penalization", SIAM/ASA Journal on Uncertainty Quantification, vol. 2, 305–335, 2014.

http://epubs.siam.org/doi/abs/10.1137/130925426

- L. Azzimonti, M.A. Cremona, A. Ghiglietti, F. Ieva, A. Menafoglio, A. Pini, P. Zanini: "BARCAMP: Technology Foresights and Statistics for the Future" in "Advances in Complex Data Modeling and Computational Methods in Statistics - Contributions to Statistics", Springer, eds: A.M. Paganoni, P. Secchi, 53–67, 2014.

2013

- L. Azzimonti, F. Ieva, A.M. Paganoni: "A new unsupervised classification technique through nonlinear non parametric mixed effects models" in "Complex Models and Computational Methods in Statistics - Contributions to Statistics", Springer, eds: Grigoletto, Lisi, Petrone, 1–11, 2013

- L. Azzimonti, F. Ieva, A.M. Paganoni: "Nonlinear nonparametric mixed-effects models for unsupervised classification", Computational Statistics, vol. 28, no. 4, 1549–1570, 2013

http://www.springerlink.com/content/5243v4w550168827/

2011

- C. de Lalla, A. Rinaldi, D. Montagna, L. Azzimonti, M.E. Bernardo, L.M. Sangalli, A.M. Paganoni, R. Maccario, A. Di Cesare-Merlone, M. Zecca, F. Locatelli, P. Dellabona, G. Casorati: "Invariant Natural Killer T-cell reconstitution in pediatric leukemia patients given HLA-haploidentical stem cell transplantation defines distinct CD4+ and CD4- subset dynamics and associates with the remission state", The Journal of Immunology, vol. 186, no. 7, 4490–4499, 2011, http://www.jimmunol.org/content/186/7/4490

Refereed conference proceedings

2017 - E. Arnone, L. Azzimonti, F. Nobile, L. Sangalli: "A time-dependent PDE regularization to model functional data defined over spatio-temporal domains" in "Functional Statistics and Related Fields", Springer International Publishing, eds: G. Aneiros, E.G. Bongiorno, R. Cao, P. Vieu, 41–44, 2017.
https://doi.org/10.1007/978-3-319-55846-2_6

2014 - L. Azzimonti, L.M. Sangalli, P. Secchi: "Modeling prior knowledge on complex phenomena behaviors via partial differential equations", Proceedings of the 47th Scientific Meeting of the Italian Statistical Society 2014, Cagliari, June 11-13, 2014, http://www2.mate.polimi.it/ocs/viewpaper.php?id=403&cf=33

2013 - L. Azzimonti, L.M. Sangalli, P. Secchi: "Spatial regression with PDE penalization: an application to blood velocity field estimation", Proceedings of the 8th conference on statistical computation and complex systems, Milano, September 9-11, 2012, http://www2.mate.polimi.it/ocs/viewpaper.php?id=403&cf=33

2012 - L. Azzimonti, L.M. Sangalli, P. Secchi, M. Domanin: "PDE penalization for spatial fields smoothing", Proceedings of the 46th Scientific Meeting of the Italian Statistical Society 2012, Rome, June 20-22, 2012, http://meetings.sis-statistica.org/index.php/sm/sm2012/paper/view/1962

2011 - L. Azzimonti, F. Ieva, A.M. Paganoni: "A new unsupervised classification algorithm for nonlinear non parametric mixed effects models", Proceedings of the 7th conference on statistical computation and complex systems, Padova, September 19-21, 2011, http://homes.stat.unipd.it/mgri/SCo2011/Papers/CS/CS-8/azzimonti_ieva_paganoni.pdf

- L. Azzimonti, M. Domanin, L.M. Sangalli, P. Secchi: "Surface estimation via spatial spline models with PDE penalization", Proceedings of the 7th conference on statistical computation and complex systems, Padova, September 19-21, 2011, http:// homes.stat.unipd.it/mgri/SCo2011/Papers/CS/CS-3/azzimonti_domanin_sangalli_secchi.pdf

2010 - L. Azzimonti, C. de Lalla, D. Montagna, A.M. Paganoni, L.M. Sangalli: "Mixed-effects models for growth curves: an application to the study of reconstitution kinetics of lymphocyte subpopulations", Proceedings of the 45th Scientific Meeting of the Italian Statistical Society 2010, Padova, June 16-18, 2010, http://homes.stat.unipd.it/mgri/SIS2010/Program/contributedpaper/647-1344-1-DR.pdf

Speeches and presentations at conferences and workshops

2010-2014 20 speeches and presentations during national and international conferences and workshops including:

- "Spatial regression with PDE penalization", International Conference of the ERCIM WG on Computational and Methodological Statistics - invited session, London

- "Mixed Finite Elements for spatial regression with PDE penalization", European Numerical Mathematics and Advanced Applications Conference, Lausanne, Switzerland

- "PDE regularized blood velocity estimation", High Dimensional and Dependent Functional Data Conference, Bristol, United Kingdom

- "PDE penalized statistical estimation of blood flow velocity profiles", 11th Conference of the Italian Society for Applied and Industrial Mathematics - invited session, Torino, Italy

- "Non parametric estimation in nonlinear mixed-effects models for unsupervised classification", 31st Conference of Applied Statistics in Ireland, Galway, Ireland.

Full details available under request.

Awards and grants

Best Graduate Student Prize of the Academic year 2008-2009 for the Master Degree in Mathematical Engineering at Politecnico di Milano, Italy, April 20, 2011.

Best Graduate Student Prize of the Academic year 2006-2007 for the Bachelor's Degree in Mathematical Engineering at Politecnico di Milano, Italy, March 12, 2009.

Grant for early career researchers for the attendance of the school "Statistical Modelling for Biological and Environmental Systems" in Venice, Italy, funded by CRiSM - Statistical Department of the University of Warwick September 12-16, 2011.

Scientific and management activities

2016-2017 Co-investigator of the project **"Statistical learning and inference on big data with probabilistic graphical models"**, funded by SNSF - Swiss National Science Foundation.

2016 Manager of the projects **"Analytics"**, in collaboration with Ente Ospedaliero Cantonale, and **"Data mining for public statistics"**, in collaboration with Ustat, Statistical office of Canton Ticino..

2015 Manager of the projects **"Support for the master plan development"**, in collaboration with Ente Ospedaliero Cantonale, and **"Climate change impact on debris flow hazard in Ticino region"**.

2014 Responsible for the statistical analysis within the project **"Study of Chronic Lymphocitic Leukemia"** in collaboration with DIBIT - San Raffaele Hospital in Milan.

2014 Manager of the projects **"Workforce management optimization for car parking companies"**, **"Customer intelligence for automotive companies"** and **"Mathematical models for food safety'**

2013 Co-responsible for the organization of the BarCamp "Technology foresight and statistics for the future" during Sco 2013 conference at Politecnico di Milano.

2011 - 2013 Co-investigator of the FIRB "Futuro in Ricerca" project **"Advanced statistical and numerical methods for the analysis of high dimensional functional data in life sciences and engineering"**, funded by MIUR Ministero dell'Istruzione dell'Università e della Ricerca and co-investigator of the PRIN project **"Advanced numerical methods and applications for scientific computing"**, funded by MIUR Ministero dell'Istruzione dell'Università e della Ricerca.

2008 - 2013 Co-responsible for the statistical analysis within the projects: **"MACAREN@MOX"** (Mathematics for Catorid Endarterectomy) in collaboration with U.O. di Chirurgia Vascolare Fondazione I.R.C.C.S. Ca' Granda Ospedale Maggiore Policlinico, Milano and Dipartimento di Scienze Chirurgiche Specialistiche, Università di Milano, **"iNKT cell reconstitution"** in collaboration with DIBIT - San Raffaele Hospital in Milan, **"Cytotoxic treatment for rectal cancer"** in collaboration with San Raffaele Hospital in Milan and **"Equine growth Hormone"** in collaboration with the Veterinary Medicine Department - Università degli Studi di Milano.

Other academic activities

Tutoring for thesis

Master's Degree in Mathematical Engineering "Analysis of Doppler blood flow velocity in carotid arteries for the detection of atherosclerotic plaques", October 4, 2011.

Bachelor's Degree in Mathematical Engineering "Metodi numerici per stime di massima verosimiglianza" ("Numerical methods for maximum likelihood estimates"), December, 2012.

Memberships and affiliations

2015 ENBIS – European Network for Business and Industrial Statistics;

2010–2013 MOX – Laboratory for Modeling and Scientific Computing, Dip. di Matematica, Politecnico di Milano;

2012–2013 SIMAI Società Italiana di Matematica Applicata e Industriale;

2010–2013 SIS Società Italiana di Statistica;

2010–2013 GNAMPA Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni.

Language skills

Mother tongue(s) **Italian**

Self-assessment
European level

	Understanding			Speaking				Writing	
	Listening		Reading	Spoken interaction		Spoken production			
English	C1	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user
French	B2	Independent user	B2	Independent user	B2	Independent user	B2	Independent user	B1	Independent user

Certificates English: TOEFL (240/300)

Computer and programming skills

Extensive knowledge of R (statistical data analysis), Matlab, Octave (mathematical programming) and FreeFem++ (Finite Element programming language). Good C++, Python and Latex programming skills. Extensive knowledge of Finite Element programming and good knowledge of parallel computing. Proficient user of Mac OSX and Windows XP, Vista, 7. Good knowledge of command-line Unix. Proficient user of the Microsoft Office suite of programs. Basic knowledge of WinBUGS, stan, HTML, SQL.

Management skills

Project management, team building, communication, customer orientation, relationship management.

For further information visit the website `http://people.idsia.ch/~azzimonti/`