

Curriculum Vitae

Personal Information

Name: **Maurizio Filippone**

Nationality: Italian

Current position: **Lecturer** with the School of Computing Science, University of Glasgow.

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Web Page: www.dcs.gla.ac.uk/~maurizio/

Education

- From 01-01-2005 to 05-05-2008
Ph.D. in Computer Science
Department of Computer and Information Sciences - University of Genova
Thesis title: Central Clustering in Kernel-Induced Spaces
Thesis topics: kernel methods for clustering, spectral clustering, relational clustering, fuzzy clustering.
- From 01-09-1998 to 14-07-2004
Master's Degree in Physics
Department of Physics - University of Genova
Grades: 110/110
Thesis title: Ensemble methods for time series analysis and forecasting
Thesis topics: Non linear systems, regression, ensemble of learning machines, signal processing.
- From 01-09-1993 to 01-07-1998
Diploma in electronics and telecommunications
High School I.T.I.S. Italo Calvino - Genova
Grades: 60/60

Fellowships

- From 01-01-2010 to 31-08-2011
Department of Statistical Science - University College London (2010 with the Department of Computing Science - University of Glasgow)
1-19 Torrington Place, London, WC1E 7HB - United Kingdom.
Grant: The Synthesis of Probabilistic Prediction & Mechanistic Modelling within a Computational & Systems Biology Context
PI: Prof. Mark Girolami
- From 15-03-2008 to 30-11-2009
Department of Computer Science - University of Sheffield
Regent Court, 211 Portobello, Sheffield, S1 4DP - United Kingdom
Grant: ALMS: Advanced Lifestyle Monitoring Systems
Topics of the fellowship: novelty detection, statistical testing, Bayesian inference in data modeling.
PI: Dr Guido Sanguinetti

- From 01-03-2007 to 30-10-2007
Department of Information and Software Engineering - George Mason University
4400 University Drive, Fairfax, VA 22030 - USA
Grant: Detecting Suspicious Behavior in Reconnaissance Images
Topics of the fellowship: outlier detection, density estimation, relational clustering.
PI, co-PI: Prof. Daniel Barbarà and Prof. Carlotta Domeniconi
- From 20-07-2006 to 30-10-2006
Consorzio Venezia Ricerche
Via della Libertà 12, 30175 Marghera, Venezia - Italy
Grant: Tide level forecasting in the lagoon of Venezia
Topics of the fellowship: time series analysis and forecasting, regression, ensembles of learning machines.
Supervisor: Prof. Elio Canestrelli
- From 01-09-2005 to 30-04-2007
Department of Computer Science - University of Genova
Via Dodecaneso 35, 16146 Genova - Italy
Topic of the fellowship:
Novel clustering techniques with applications in image segmentation and analysis
Supervisor: Dr Stefano Rovetta
- From 01-06-2005 to 31-08-2005
Department of Computer Science and Department of Endocrinologic and Metabolic Sciences - University of Genova
Via Dodecaneso 35, 16146 Genova - Italy
Topic of the fellowship:
Application of advanced clustering techniques in diagnostic problems in rheumatology
Supervisor: Prof. Guido Rovetta
- From 01-09-2004 to 31-09-2004
Department of Computer Science - University of Genova
Via Dodecaneso 35, 16146 Genova - Italy
Topic of the fellowship:
Development of a package in R and C languages for time series analysis and forecasting
Supervisor: Prof. Francesco Masulli
- From 01-12-2003 to 31-12-2003
Department of Oncology, Biology and Genetic (148) - University of Genova
Largo Rosanna Benzi 10, 16132 Genova - Italy
Topic of the fellowship:
Development of a front-end in Perl Tk and Java languages for an immunitary system simulator in C language
Supervisor: Prof. Franco Celada

Awards

- Best paper published in 2008 in the journal Pattern Recognition:
M. Filippone, F. Camastra, F. Masulli, and S. Rovetta. **A survey of kernel and spectral methods for clustering.** *Pattern Recognition*, 41(1):176-190, January 2008.
Manuscripts published in volume 41 (year 2008) have been judged by the Editors-in-Chief and the members of the Editorial and Advisory Boards of the journal based on the following criteria: originality of the contribution, presentation and exposition of the manuscript, and citations by other researchers.

Publications

Journals

- M. Filippone, G. Sanguinetti.
Approximate inference of the bandwidth in multivariate kernel density estimation.
Computational Statistics & Data Analysis, 55(12):3104-3122, 2011.
- M. Filippone, G. Sanguinetti.
A Perturbative Approach to Novelty Detection in Autoregressive Models.
IEEE Transactions on Signal Processing, 59(3):1027-1036, March 2011.
- L. Mohamed, B. Calderhead, M. Filippone, M. Christie, and M. Girolami.
Population MCMC methods for history matching and uncertainty quantification.
Computational Geosciences. to appear.
- M. Filippone, F. Masulli, and S. Rovetta.
Applying the possibilistic c-means algorithm in kernel-induced spaces.
IEEE Transactions on Fuzzy Systems, 18(3):572-584, June 2010.
- M. Filippone, F. Masulli, and S. Rovetta.
Simulated annealing for supervised gene selection.
Soft Computing. in press.
- M. Filippone, G. Sanguinetti.
Information theoretic novelty detection.
Pattern Recognition, 43(3):805-814, March 2010.
- F. Camastra and M. Filippone.
A comparative evaluation of nonlinear dynamics methods for time series prediction.
Neural Computing and Applications, 18(8):1021-1029, November 2009.
- M. Filippone, F. Masulli, and S. Rovetta.
Clustering in the membership embedding space.
International Journal of Knowledge Engineering and Soft Data Paradigms, 4(1):363-375, 2009.
- S. Rovetta, F. Masulli, M. Filippone.
Soft ranking in clustering.
Neurocomputing, 72(7-9):2028-2031, March 2009.
- M. Filippone.
Dealing with non-metric dissimilarities in fuzzy central clustering algorithms.
International Journal of Approximate Reasoning, 50(2):363-384, February 2009.

- M. Filippone, F. Camastra, F. Masulli, and S. Rovetta.
A survey of kernel and spectral methods for clustering.
Pattern Recognition, 41(1):176-190, January 2008.

This paper has been chosen to be the best paper published in 2008 in the journal *Pattern Recognition*

Discussions

- M. Filippone, A. Mira, M. Girolami.
Discussion of the paper **Sampling Schemes for Generalized Linear Dirichlet Process Random Effects Models** by M. Kyung, J. Gill, and G. Casella. *Statistical Methods & Applications* to appear.
- M. Filippone.
Discussion of the paper **Riemann manifold Langevin and Hamiltonian Monte Carlo methods** by M. Girolami and B. Calderhead. *Journal of the Royal Statistical Society, Series B (Statistical Methodology)*, 73(2):123-214, 2011.
- V. Stathopoulos and M. Filippone.
Discussion of the paper **Riemann manifold Langevin and Hamiltonian Monte Carlo methods** by M. Girolami and B. Calderhead. *Journal of the Royal Statistical Society, Series B (Statistical Methodology)*, 73(2):123-214, 2011.

Conferences

- D. Barbará, C. Domeniconi, Z. Duric, M. Filippone, E. Lawson, and R. Mansfield.
Detecting suspicious behavior in surveillance images.
In ICDM Workshops, pages 891-900. IEEE Computer Society, 2008.
- F. Camastra and M. Filippone.
SVM-based time series prediction with nonlinear dynamics methods.
In Bruno Apolloni, Robert J. Howlett, and Lakhmi C. Jain, editors,
KES (3), volume 4694 of *Lecture Notes in Computer Science*, pages 300-307. Springer, 2007.
- S. Rovetta, F. Masulli, and M. Filippone.
Membership embedding space approach and spectral clustering.
In Bruno Apolloni, Robert J. Howlett, and Lakhmi C. Jain, editors,
KES (3), volume 4694 of *Lecture Notes in Computer Science*, pages 901-908. Springer, 2007.
- E. Canestrelli, P. Canestrelli, M. Corazza, M. Filippone, S. Giove, and F. Masulli.
Local learning of tide level time series using a fuzzy approach.
In IJCNN - International Joint Conference on Neural Networks, Orlando - Florida, 12-17 August 2007.
- M. Filippone, F. Masulli, and S. Rovetta.
Possibilistic clustering in feature space.
In Francesco Masulli, Sushmita Mitra, and Gabriella Pasi, editors,
WILF, volume 4578 of *Lecture Notes in Computer Science*, pages 219-226. Springer, 2007.
- M. Filippone, F. Masulli, S. Rovetta, S. Mitra, and H. Banka.
Possibilistic approach to biclustering: An application to oligonucleotide microarray data analysis.
In Corrado Priami, editor, *Computational Methods in Systems Biology*,
volume 4210 of *Lecture Notes in Computer Science*, pages 312-322. Springer Berlin / Heidelberg, 2006.

- M. Filippone, F. Masulli, and S. Rovetta.
Gene expression data analysis in the membership embedding space: A constructive approach.
In *CIBB 2006 - Third International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics*,
Genova - Italy, 29-31 August 2006.
- M. Filippone, F. Masulli, and S. Rovetta.
Supervised classification and gene selection using simulated annealing.
In *IJCNN - International Joint Conference on Neural Networks*,
Vancouver - Canada, 16-21 July 2006.
- M. Filippone, F. Masulli, and S. Rovetta.
Unsupervised gene selection and clustering using simulated annealing.
In Isabelle Bloch, Alfredo Petrosino, and Andrea Tettamanzi, editors,
WILF, volume 3849 of *Lecture Notes in Computer Science*, pages 229-235. Springer, 2005.
- F. Masulli, S. Rovetta, and M. Filippone.
Clustering genomic data in the membership embedding space.
In *CI-BIO - Workshop on Computational Intelligence Approaches for the Analysis of Bioinformatics Data*,
Montreal - Canada, 5 August 2005.
- S. Rovetta, F. Masulli, and M. Filippone.
Soft rank clustering.
In Bruno Apolloni, Maria Marinaro, Giuseppe Nicosia, and Roberto Tagliaferri, editors,
WIRN/NAIS, volume 3931 of *Lecture Notes in Computer Science*, pages 207-213. Springer, 2005.
- M. Filippone, F. Masulli, and S. Rovetta.
ERAF: a R package for regression and forecasting.
In *Biological and Artificial Intelligence Environments*, pages 165-173, Secaucus, NJ, USA, 2005.
Springer-Verlag New York, Inc.

Technical Reports

- M. Filippone and G. Sanguinetti.
Novelty detection in autoregressive models using information theoretic measures.
Technical Report CS-09-06, Department of Computer Science, University of Sheffield, July 2009.
- M. Filippone and G. Sanguinetti.
Information theoretic novelty detection.
Technical Report CS-09-02, Department of Computer Science, University of Sheffield, February 2009.
- M. Filippone.
Fuzzy clustering of patterns represented by pairwise dissimilarities.
Technical Report ISE-TR-07-05, Department of Information and Software Engineering, George Mason University, October 2007.
- M. Filippone, F. Camastra, F. Masulli, and S. Rovetta.
A survey of kernel and spectral methods for clustering.
Technical Report DISI-TR-06-19, Department of Computer and Information Sciences at the University of Genova, Italy, 18th October 2006.

- M. Filippone, F. Masulli, and S. Rovetta.
A wrapper approach to supervised input selection using simulated annealing.
 Technical Report DISI-TR-06-10, Department of Computer and Information Sciences at the University of Genova, Italy, 12th June 2006.

Theses

- M. Filippone.
Central Clustering in Kernel-Induced Spaces.
 Phd Thesis in Computer Science, University of Genova, February 2008.
- M. Filippone.
Metodi di ensemble per la previsione di serie storiche.
 Master's Degree thesis in physics, University of Genova, July 2004.

Magazines

- C. Calcagno, M. Filippone, and D. Ghersi.
 R: Potenza e versatilità per l'analisi statistica.
 Linux & C., (53):41-46, June 2006.

Referee Activity

- Journals: Pattern Recognition (19), IEEE Transactions on Neural Networks (11), Pattern Recognition Letters (9), IEEE Transactions on Signal Processing (4), IEEE Signal Processing Letters (2), IEEE Transactions on Pattern Analysis and Machine Intelligence (1), Computational Intelligence (1), Neural Processing Letters (1), IEEE Transactions on Parallel and Distributed Systems (1), Soft Computing (1), EURASIP Journal on Advances in Signal Processing (1), Information Sciences (1).
- Conferences: PRIB 2010 (2), IJCNN 2010 (2), PRIB 2009 (4), CIBB 2009 (4), IFSA 2009 (4), IJCNN 2009 (8), CIBB 2008 (4), WCCI 2008 (3), ICDM 2007 (2), IJCNN 2007 (4), CIBB 2007 (1), IJCNN 2006 (5), CIBB 2006 (1).

Conferences Attended

- 09 June 2011, Bologna, Italy
 Italian Statistical Society Conference (SIS).
 Oral presentation: *Bayesian inference in latent variable models and applications.*
- 10-11 December 2010, Whistler, BC, Canada
 NIPS 2010 Workshops: Neural Information Processing Systems Conference.
 Poster presentation: *Posterior Inference in Latent Gaussian Models Using Manifold MCMC Methods.*
- 23-26 August 2010, Istanbul, Turkey
 ICPR 2010 - 20th International Conference on Pattern Recognition
I received the award for the best paper published in 2008 in Pattern Recognition journal
- 12-14 July 2010, Sheffield, United Kingdom
 UCM 2010 - Uncertainty in Computer Models 2010 conference
- 5-9 July 2010, Glasgow, United Kingdom
 IWSM 2010 - 25th International Workshop on Statistical Modelling

- 3-8 June 2010, Benidorm, Spain
Ninth Valencia International Meeting on Bayesian Statistics - 2010 World Meeting of the International Society for Bayesian Analysis.
Poster presentation: *Inference for Gaussian Process Emulation of Oil Reservoir Simulation Codes*.
- 6-7 April 2010, Warwick, United Kingdom
WOGAS2 - Workshop on Geometric and Algebraic Statistics 2.
- 3-5 March 2010, Edinburgh, United Kingdom
Mixture estimation and applications.
Poster presentation: *Information Theoretic Novelty Detection for Mixtures of Gaussians*.
- 7-9 September 2009, Sheffield, United Kingdom
PRIB 2009: Pattern Recognition in Bioinformatics 2009.
- 20-21 May 2009, Swansea, United Kingdom
NCAF Meeting: Neural Computing and Applications. Special Theme - Grand Challenges in Information-Driven Healthcare.
- 15-19 December 2008, Pisa, Italy
ICDM 2008: IEEE International Conference on Data Mining.
Oral presentation: *Detecting Suspicious Behavior in Surveillance Images*.
- 8-13 December 2008, Vancouver, BC, Canada
NIPS 2008: Neural Information Processing Systems Conference.
- 9-10 September 2008, Sheffield, United Kingdom
NCAF Meeting: Neural Computing and Applications. Special Theme - Dynamics and Dynamic Systems.
Oral presentation: *Information Theoretic Novelty Detection*.
- 18-19 June 2008, Oxford, United Kingdom
NCAF Meeting: Neural Computing and Applications. Special Theme - Signal Processing and Biomedical Applications.
- 31 March - 2 April 2008, Sheffield, United Kingdom
Data Modelling Workshops & Symposium.
- 13-17 August 2007, Orlando, FL - USA
IJCNN 2007 - International Joint Conferences on Neural Networks.
Poster presentation: *Local learning of tide level time series using a fuzzy approach*.
- 17 August 2007, Orlando, FL - USA
CI-BIO 2007 - Post-Conference Workshop on Computational Intelligence Approaches for the Analysis of Bioinformatics Data.
Oral presentation of the paper: *Aggregating Memberships in Possibilistic Biclustering*.
- 27-29 September 2006, Ancona - Italy
CISI 06 Conferenza Italiana Sistemi Intelligenti.
Poster presentation: *Input Selection with Mixed Data Sets: A Simulated Annealing Wrapper Approach*.
- 15-16 September 2006, Genova - Italy
BioLeMiD 06 - Third Bioinformatics Meeting on Machine Learning for Microarray Studies of Disease: biomarker selection.

- 29-31 August 2006, Genova - Italy FLINS 2006 - 7th International FLINS Conference on Applied Artificial Intelligence.
- 28 June 2006, Genova - Italy
Workshop on Trends in Computational Sciences.
- 22 June 2006, Genova - Italy
The I LIMBS day - A free one-day workshop about intelligence.
- 21 June 2006, Genova - Italy
Second workshop on Analytic Methods for Learning Theory: Learning, Regularization and Approximation
- 15-17 September 2005, Crema - Italy
WILF 05 - International Workshop on Fuzzy Logic and Applications.
Oral presentation of the paper: *Unsupervised gene selection and clustering using simulated annealing*.
- 16-17 June 2005, Genova - Italy
CLIP 2005 - Workshop on Cross-language information processing.
Oral presentation of the paper: *Soft rank clustering*.
- 8-11 June 2005, Vietri sul Mare - Italy
WIRN 05 - XVI Italian Workshop on Neural Networks.
Oral presentation of the paper: *Soft rank clustering*.
- 14-17 September 2004, Perugia - Italy
WIRN 04 - XV Italian Workshop on Neural Networks.
Poster presentation: *ERAF: a R package for regression and forecasting*.

Talks

- 08 February, 2011, University College London (CSML seminars series) - *Calibration of Oil Reservoir Simulation Codes*.
- 24 January, 2011, University College London - *Classification of fMRI data using latent Gaussian models*.
- 12 November, 2010, University of Glasgow - *Information Theoretic Novelty Detection*.
- 13 October, 2010, Royal Statistical Society - *Discussion of the paper "Riemann manifold Langevin and Hamiltonian Monte Carlo methods" by M. Girolami and B. Calderhead*.
- 26 March, 2010, Liverpool John Moores University - *Information Theoretic Novelty Detection*.
- 11 November, 2009, University of Edinburgh - *Information Theoretic Novelty Detection*.
- 21 October, 2009, University of Sheffield - Tutorial presentation for the Speech and Hearing group - *The probabilistic approach in data modeling*.
- 14 July, 2009, Columbia University - *Information Theoretic Novelty Detection*.
- 21 January, 2009, University of Glasgow - *Information Theoretic Novelty Detection*.
- 22 December, 2008, University of Genova - *Information Theoretic Novelty Detection*.
- 3 March, 2008, University of Milano - *Central Clustering in Kernel-Induced Spaces*.

- 27 February, 2008, University of Napoli Parthenope - *Central Clustering in Kernel-Induced Spaces*.
- 27 September, 2007, George Mason University - *Kernel and Spectral Methods for Clustering*.
- 15 November 2006, University of Genova - *Kernel and Spectral Methods for Clustering*.
- 21 March 2006, University of Genova - *Spectral Approach to Clustering*.
- 20 December 2005, University of Genova - *Subsequence Matching for Time Series Forecasting*.

Teaching Activity

Exam boards

- 2005 and 2006:
Neural Networks and Soft Computing - University of Genova,
Operating Systems - University of Pisa

Teaching

- 10-2008
Lab assistant (2 hours) Bioinformatics
Computational Biology module for the MSC in Biological and Bioprocess Engineering
Lecturer: Guido Sanguinetti
- 09-2005 - 12-2005
Lab assistant (30 hours) Neural Networks
IV / V year, Master's Degree in Computer Science - University of Genova
Lecturer: Stefano Rovetta
- 09-2005 - 12-2005
Lab assistant (10 hours) Soft Computing
III year, Master's Degree in Computer Science - University of Genova
Lecturer: Francesco Masulli
- 09-2004 - 12-2004
Lab assistant (10 hours)
Introduction to R language (2 hours) Neural Networks
IV / V year, Master's Degree in Computer Science - University of Genova
Lecturer: Francesco Masulli

Other Teaching Experiences

- 09-2005 - 06-2006
Teacher of Mathematics (120 hours)
Teacher of Computer Science (80 hours)
IAL LIGURIA - High School (age 14) - Commercial Operator program
email: informazioni@ial.liguria.it, segreteria@ial.liguria.it

Personal Skills

Languages

- Mother tongue: Italian
- English:
 - From 05-2007 to 10-2007 I attended the grammar, conversation, and pronunciation courses for non-native speakers (60 hours) at George Mason University, Fairfax, VA 22030 - USA
 - From 20-07-2004 to 05-08-2004 I attended an intermediate level course (30 hours) at Byron School, 79, Hills Road - CB2 1PG Cambridge

Computing Skills

Operating systems: Windows, Unix and Linux.

Programming languages: R, C, C++, Fortran and Assembler languages.

Scripting: Perl language.

Web: HTML and PHP languages.

Databases: SQL language.

Editing: Latex and Word.