RITA MORISI

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PRESENT POSITION

IMT Institute for advanced studies Lucca February 2013 – Present
PhD candidate in Computer Decision and Systems Science
Supervisor: Assistant professor: Giorgio Gnecco

- Theoretical study of machine learning methods, focusing on semi-supervised techniques
- Study and application of graph-based techniques in semi-supervised learning field and control theory
- Study of spectral graph theory and its application in the consensus problem and pattern analysis field
- Application of machine learning techniques in the medical field for diseases detection and study

EDUCATION

University of Bologna September 2009 – October 2011
Laurea magistrale in Matematica (*Master's degree in Mathematics)*

- Final grade: 110/110 cum laude
- Dissertation on "Pattern recognition methods for the analysis of medical images"
- Relevant subjects: advanced numerical analysis, applied geometry, mathematical physics, applied analysis, probability, statistics

University of Bologna September 2006 – July 2009
Laurea in Matematica (*Bachelor in Mathematics*)

- Final grade: 110/110 cum laude
- Dissertation on "L'ellissoide di inerzia nello studio della dinamica del corpo rigido in meccanica classica" ("Study of rigid body dynamics via the inertia tensor in classical mechanics")
- Relevant subjects: numerical analysis, geometry, physics, mathematical physics, analysis, informatics

SUMMER SCHOOLS, WORKSHOPS AND TRAINING

"AI*IA Symposium on Artificial Intelligence" (Pisa, Italy) 10-12 December 2014

"Workshop on Embedded Optimization EMBOPT 2014" (Lucca, Italy) 8-9 September 2014

"Regularization Methods for High Dimensional Learning" (Genova, Italy) 3-7 June 2013

- Studied and evaluated regularization techniques for high dimensional learning and their applications
- Studied supervised and unsupervised methods for classification and regularization and their applications

RELEVANT WORK EXPERIENCE

Universität Hamburg, Department of Computer Science February 2015 – June 2015
Visitor in the Machine Learning Group under the supervision of Prof. Ulrike von Luxburg

- Studied spectral graph theory and its application in control field and classification problems
- Studied graph-based methods in the analysis and classification of data

- Worked on the consensus problem studying the topology and the properties of the graph involved in this context

University of Bologna, Department of Physics November 2011 – January 2013
Research assistant for the European project CHIRON ("Cyclic and person-centric health management: Integrated approach for home, mobile and clinical environments")

- Developed and improved pattern recognition algorithms and techniques using Matlab
- Researched new and more specific methods for the segmentation of magnetic resonance images using Matlab and ImageJ
- Analysed the results obtained during the different phases of segmentation and pattern recognition
- Worked in a team reporting to the lead researchers on a daily basis

Universitat Politècnica de Catalunya, CIMNE Research Center June – September 2011
Research assistant for the European project CHIRON ("Cyclic and person-centric health management: Integrated approach for home, mobile and clinical environments")

- Studied segmentation algorithms for magnetic resonance images
- Implemented pattern recognition techniques
- Researched specific techniques for Magnetic Resonance Imaging
- Discussed and analysed the results with the research group on a regular basis

IT SKILLS

- Very good knowledge of technical computing language **Matlab**
- Good knowledge of the technical computing software **Mathematica**
- Good knowledge of the **programming language C**
- Good knowledge of the **image processing program ImageJ**
- Very good knowledge of the programme **Latex**
- Good knowledge of **Microsoft Office** (Word, Excel, Power point)

LANGUAGE SKILLS

- Good written and spoken English
- Good spoken Spanish

REVIEWER ACTIVITY

- **Reviewer** for the international journal IEEE Transactions on Neural Networks and Learning Systems

PUBLISHED PAPERS

Papers in international journals

- G. Gnecco, R. Morisi, G. Roth, M. Sanguineti, A. C. Taramasso, "Supervised and semi-supervised classifiers for the detection of flood-prone areas", Soft Computing, 2015, to appear.

- G. Gnecco, R. Morisi, A. Bemporad, "Sparse solutions to the average consensus problem via various regularizations of the fastest mixing Markov-chain problem", IEEE Transactions on Network Science and Engineering, vol. 2, n. 3, pp. 97-111, 2015. link

- R. Morisi, B. Donini, N. Lanconelli, J. Rosengarden, J. Morgan, S. Harden, and N. Curzen, "Semi-automated Scar Detection in Delayed Enhanced Cardiac Magnetic Resonance Images", International Journal of Modern Physics C (IJMPC), vol. 26 n. 1, 2015. link

- C. Rusu, R. Morisi, D. Boschetto, R. Dharmakumar, and S. A. Tsaftaris, "Synthetic Generation of Myocardial Blood-Oxygen-Level-dependent MRI Time Series Via Structural Sparse Decomposition Modeling", IEEE Transactions on Medical Imaging, vol. 33 n. 7, pp. 1422-1433, 2014. link

Conference papers

- G. Gnecco, A. Bemporad, R. Morisi, M. Gori, M. Sanguineti, "Online learning as an LQG optimal control problem with random matrices". Proceedings of IEEE ECC 2015 (to appear).
- R. Morisi, G. Gnecco, N. Lanconelli, et al., "Binary and multi-class Parkinsonian disorders classification using Support Vector Machines". In: "Lecture Notes in Computer Science", Springer, Berlin Heidelberg.
- G. Gnecco, R. Morisi, and A. Bemporad, "Sparse Solutions to the Average Consensus Problem via l1-norm Regularization of the Fastest Mixing Markov-Chain Problem". In: Proceedings of the 53rd Annual Conference on Decision and Control (CDC). IEEE, pp. 2228-2233. ISBN 978-1-4799-7746-8 (2014).
- L. Lara-Rodriguez, S. Vera, F. Perez, N. Lanconelli, R. Morisi, B.Donini, et al., "Supervised Learning Modelization and Segmentation of Cardiac Scar in Delayed Enhanced MRI". Lecture Notes in Computer Science, Volume 7746, 2013, Statistical Atlases and Computational Models of the Heart, Imaging and Modelling Challenges (STACOM 2012). link
- L. Lara-Rodriguez, S. Vera, F. Perez, N. Lanconelli, R. Morisi, et al., "Cardiac scar detection, segmentation and quantification in MRI images for ICD treatment planning", International Journal of Computer Assisted Radiology and Surgery, vol 7, s. 1 (Proceedings of CARS 2012, Pisa, Italy), 2012.
- R. Morisi, R. Dharmakumar, and S. A. Tsaftaris, "Unsupervised Ischemia Detection at Rest with CP-BOLD Cardiac MRI: A Simulation Study Employing Independent Component Analysis". Presented for the International Society of Magnetic Resonance in Medicine (ISMRM) Meeting, Milan, May 2014. Magna Cum Laude Award received. link

Working papers

- R. Morisi, N. Lanconelli, G. Gnecco, "Binary and multi-class Parkinsonian disorders classification with graph-based features using Support Vector Machines", in preparation.

REFERENCES

- Assistant professor Giorgio Stefano Gnecco (IMT Institute for Advanced Studies, Lucca, giorgio.gnecco@imtlucca.it)
- Full professor Marco Gori (Department of Engineering, University of Siena, marco@dii.unisi.it)
- Associate professor Marcello Sanguineti (Department of Informatics, Bioengineering, Robotics and Information Science, University of Genova, marcello.sanguineti@unige.it)
- Assistant professor Nico Lanconelli (Department of Physics, University of Bologna, nico.lanconelli@unibo.it)
- Associate professor Elena LoliPiccolomini (Department of Mathematics, University of Bologna, piccolom@dm.unibo.it)