

CURRICULUM VITAE ET STUDIORUM

Matteo Matteucci

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PERSONAL DATA

Name: Matteo
Family name: Matteucci
Date of birth: 23rd April 1974
Place of birth: Nuoro, Italy
Citizenship: Italian

Office Address

Department of Electronics and Information
Via Ponzio 34/5, I-20133, Milano (MI), Italy
Phone: +39 02 2399 3470 – Fax: +39 02 2399 3411
Email: matteucc@elet.polimi.it
Home page: www.dei.polimi.it/people/matteucci

EDUCATION

04/2000–03/2003 PhD in Computer Engineering and Automation at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

Thesis title: *Evolutionary Learning of Adaptive Models within a Bayesian Framework*

Advisor: Prof. Andrea Bonarini

08/2001–08/2002 Master of Science in *Knowledge Discovery and Data Mining* at the “Center for Automatic Learning and Discovery” at Carnegie Mellon University (Pittsburgh, PA - USA).

Thesis title: *ELeaRNT: Evolutionary Learning of Rich Neural Network Topologies*

Advisor: Prof. Manuela Veloso

07/1999 National examination as Engineer [final grade 100/100].

09/1993–04/1999 Laurea degree in Computer Engineering at Politecnico di Milano (Milan, Italy) [final grade 100/100 cum Laude].

Thesis title: *Rappresentazione della conoscenza fuzzy e a intervalli per algoritmi di apprendimento per rinforzo applicati ad agenti situati.*

Advisor: Prof. Andrea Bonarini

ACADEMIC POSITIONS AND AFFILIATIONS

ACADEMIC POSITIONS

Since 01/2005 Assistant Professor (*Ricercatore di ruolo non confermato*) at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

04/2003–12/2004 Research Assistant (research program *Evoluzione tecnologica e nuove applicazioni delle basi di dati e dei sistemi informativi*) at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

04/2000–03/2003 PhD Student in the Computer Engineering and Automation program at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

08/2001–08/2002 Grad Student at the *Center for Automatic Learning and Discovery* at Carnegie Mellon University (Pittsburgh, PA - USA).

07/2000–07/2002 Research Assistant (research program “*Modelli di apprendimento automatico in ambienti dinamici*”) at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

ACADEMIC ROLE

Since November 2005 Stage and Internships delegate for the Computer Engineering program (*Delegato SAT CCS Informatica*).

AFFILIATIONS

Since 2007 Member of IEEE, the Institute of Electrical and Electronics Engineers, Computational Intelligence Society.

2000–2005 Member of AI*IA, Associazione Italiana per l’Intelligenza Artificiale.

TEACHING ACTIVITIES

COURSES

03/2006–07/2008 *Methods for Intelligent Systems* for the Computer Engineering degree, Facoltà di Ingegneria dell’Informazione, Campus Como, Politecnico di Milano [30 hours] (Milan, Italy).

09/2005–02/2008 *Computer Science 1* for the Electronics Engineering degree, Facoltà di Ingegneria dell’Informazione, Campus Leonardo, Politecnico di Milano [36 hours] (Milan, Italy).

22-24/03/2006 *Soft Computing: Teoria, Tecniche e Applicazioni* PhD Course in the PhD Program in Information Engineering at the Department of Electronics and Information of Politecnico di Milano [10 hours] (Milan, Italy).

07-10/03/2006 *Soft Computing: Teoria, Tecniche e Applicazioni* PhD Course in the PhD Program in Information Engineering at the Department of Electronics and Information of Politecnico di Milano [10 hours] (Milan, Italy).

09/2003–02/2005 *Computer Science 1* for the Telecommunication Engineering degree, Facoltà di Ingegneria dell’Informazione, Campus Leonardo, Politecnico di Milano [36 hours] (Milan, Italy).

28-30/05/2003 *Soft Computing: Teoria, Tecniche e Applicazioni* PhD Course in the PhD Program in Information Engineering at the Department of Electronics and Information of Politecnico di Milano [10 hours] (Milan, Italy).

TEACHING ASSISTANTSHIPS

03/2004–07/2008 Lectures on *Natural Computation* for the course “Soft Computing” by prof. Andrea Bonarini for the Computer Engineering degree, Facoltà di Ingegneria Informatica, Campus Leonardo, Politecnico di Milano [20 hours] (Milan, Italy).

- 03/2003–01/2008 Lectures on *Natural Computation* for the course “Knowledge Engineering and Expert Systems” by prof. Andrea Bonarini for the Computer Engineering degree, Facoltà di Ingegneria Informatica, Campus Como, Politecnico di Milano [20 hours] (Milan, Italy).
- 03/2006–06/2006 Lectures [19-23] on *Neural Networks and Reinforcement Learning* for the course “Artificial Intelligence” by prof. Andrea Bonarini for the online Computer Engineering degree, Facoltà di Ingegneria Informatica, Politecnico di Milano [20 hours] (Milan, Italy).
- 11/1999–01/2000 Lectures on *LISP Language* for the course “Artificial Intelligence” by prof. Marco Somalvico for the Computer Engineering degree, Facoltà di Ingegneria Informatica, Campus Leonardo, Politecnico di Milano [20 hours] (Milan, Italy).
- 09/1999–01/2001 Lectures on *C Language* for the course “Fundamentals of Computer Science” by prof. Andrea Bonarini for the Environmental Engineering degree, Facoltà di Ingegneria Civile, Ambientale e Territoriale, Campus Leonardo, Politecnico di Milano [40 hours] (Milan, Italy).

OTHER TEACHING ACTIVITIES

- 01/02/2008 *Algoritmi Genetici - Clustering* Continuous Education Course for Indesit Company [8 hours] (Fabriano, Italy).
- 25/01/2008 *Reti Neurali Artificiali* Continuous Education Course for Indesit Company [8 hours] (Fabriano, Italy).
- 2006–2008 Tutor for the Alta Scuola Politecnica project *SenSoBot: Sensors and control for Societal Robots*
- 2005–2007 Tutor for the Alta Scuola Politecnica project *WoMan: Windows On Man*
- 17/11/2006 Lecture on *Neural Networks* for the course “Cybernetics” by prof. Andrea Bonarini in the “Sapere a tutto campo” program at Università Bocconi [2 hours] (Milan, Italy).
- 2005–2006 Tutor for the Alta Scuola Politecnica project *IRoPa: Intelligent Robotic Partners*
- 2005–2006 Tutor for the Alta Scuola Politecnica project *AMoRoSA: Autonomous Mobile Robots for Service Applications*.
- 06/09/2006 *Soft Computing: Neural Networks Theory and Applications* Continuous Education Course for an Italian Company (name undisclosed for NDA clause) [8 hours] (Milan, Italy).
- 26/05/2005 Lecture on *Dal filtraggio alla Kalman ai filtri a particelle* for the course “Robotica complementi” by prof. Domenico Sorrenti for the Computer Science degree, Facoltà di Scienze Fisiche e Naturali, Università degli Studi Milano-Bicocca [2 hours] (Milan, Italy).
- 20/05/2005 Lecture on *Tecniche di filtraggio Bayesiano* for the course “Robotica complementi” by prof. Domenico Sorrenti for the Computer Science degree, Facoltà di Scienze Fisiche e Naturali, Università Degli Studi Milano-Bicocca [2 hours] (Milan, Italy).
- 26/04/2004 Lecture on *Perché oggi non servono (ancora) le tre leggi della robotica?* for the thematic session “Dall’Intelligenza Artificiale ai robot” by Rossella Castelnuovo and Fabio Pagan for the Master Program in Scientific Communication at SISSA [1 hour] (Trieste, Italy)
- 04/2000–06/2000 *Tutoring* for the courses of *Fundamentals of Computer Science* for the Engineering degrees of Politecnico di Milano, Campus Bovisa.

THESIS AS ADVISOR OR CO-ADVISOR

I only report here theses appearing at the present date on the OPAC (On line Catalogue) of Master and PhD theses of Politecnico di Milano (they are somehow outdated).

- Matteo Taiana: “3D model-based tracking with one omnidirectional camera and particle filters”, Master Thesis, advisor Matteo Matteucci, co-advisor Alexandre Bernardino, Politecnico di Milano, 2007.
- Gianpiero Puleo: “Un sistema modulare per lo studio di sistemi di apprendimento per rinforzo in ambiente fuzzy e discreto”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2006.
- Marco Parente: “Localizzazione e identificazione oggetti mediante informazione colore e visione stereoscopica”, Master Thesis, advisor Matteo Matteucci, Politecnico di Milano, 2006.
- Davide Aliprandi, Alex Mancastropa: “Un approccio bayesiano ai sistemi di apprendimento basati su classificatori”, Master Thesis, advisor Matteo Matteucci, co-advisor Andrea Bonarini, 2006.
- Fabio Sora: “Followme : composizione *informata* di reattività e pianificazione in un robot guida”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2005.
- Carlo Pincioli: “Real-time detection of 3D scene horizontal and vertical edges in catadioptric sensors with conic mirror”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2005.
- Davide Migliore, Matteo Naccari: “Elaborazione segnale video per l’identificazione e inseguimento di oggetti in movimento”, Master Thesis, advisor Matteo Matteucci, Politecnico di Milano, 2005.
- Mario Michele Gala: “Marsode and Jerla: a framework for reinforcement learning applications in a multi-agent robot simulator”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano 2005.
- Stefano Bellotti, Roberto Casati: “Gestione dell’informazione per una rappresentazione concettuale del mondo”, Master Thesis, advisor Andrea Bonarini, co-advisor Marcello Restelli e Matteo Matteucci, Politecnico di Milano, 2005.
- Matteo Vescovi: “Soothsayer: un sistema multi-sorgente per la predizione del testo”, Master Thesis, advisor Licia Sbattella, co-advisor Matteo Matteucci, Politecnico di Milano, 2004.
- Mattia Carlo Vincenzo Tortorelli: “FEMS: Fastweb Energy Management System : sistema esperto per la gestione dell’approvvigionamento elettrico e l’analisi delle anomalie”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2003.
- Dario Spadoni: “A genetic algorithm to evolve rich neural network topologies using bayesian fitness”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2003.
- Davide Danzi, Giorgio Gatti: “Bliss 2003: un sistema di assistive technology in aiuto ai disabili verbali”, Master Thesis, advisor Licia Sbattella, co-advisors Nicola Gatti and Matteo Matteucci, Politecnico di Milano, 2003.
- Cesare Simone Basilico: “Un approccio alla sintesi automatica di strutture di reti neurali basato su algoritmi genetici”, Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2003.

- Federico Anzani, Daniele Bosisio: "Adattativita del modello colore per riconoscimento di ambienti e oggetti in ambienti dinamici", Master Thesis, advisor Matteo Matteucci, Politecnico di Milano, 2003.
- Gianluca Mattioli: "Progettazione evolutiva di reti neurali", Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2001.
- Flavio Barna: "Popeye : un robot mobile autonomo con capacita di manipolazione", Master Thesis, advisor Andrea Bonarini, co-advisor Matteo Matteucci, Politecnico di Milano, 2000.

SCIENTIFIC ACTIVITIES

TECNICAL COMMITTEE

- IFAC Technical Committee on Intelligent Autonomous Vehicles (IAV)

PROGRAM COMMITTEE AND REVIEWER

- CIMSIA 2008, IEEE International Conference on Computational Intelligence for Measurements Systems
- IAS 2008, 10th Conference on Intelligent Autonomous Systems
- WCCI 2008 (IJCNN 2008), World Congress on Computational Intelligence
- IFAC 2008, International Federation of Automatic Control World Conference
- ICRA 2008, IEEE International Conference on Robotics and Automation
- IJCNN 2007, International Joint Conference on Neural networks
- WILF 2007, International Workshop on Fuzzy Logic and Applications
- RoboVis 2007, International Workshop on Robot Vision
- RoboCup 2007,2006,2005 International Symposium
- IAV 2004, 5th IFAC Symposium on Intelligent Autonomous Vehicles
- IAS 2004, 8th Conference on Intelligent Autonomous Systems

JOURNALS FOR WHICH REVIEWER

- AICom (Artificial Intelligene Communication)
- Computer Methods and Programs in Biomedicine
- Data and Knowledge Engineering Journal
- IEEE Transactions on System Man and Cybernetics - Part C
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Evolutionary Computation
- IEEE Transactions on Instrumentation and Measurement
- IEEE Transactions on Neural Networks
- IEEE Transactions on Robotics

CHAIR OR CO-CHAIR

- ICRA 2007, IEEE International Conference on Robotics and Automation. Session: Monocular SLAM.
- IAV 2004, 5th IFAC Symposium on Intelligent Autonomous Vehicles. Session: Architectures.

PROFESSIONAL ACTIVITIES

- 12/2006–05/2007 Consultancy on *Emotion detection from bio signals* for CEFRIEL.
- 06/2000–09/2000 Special Research contract: *Ottimizzazione di paradigmi neurali per l'elaborazione di immagine*, Politecnico di Milano, Department of Electronics and Information (Milan, Italy).
- 03/2000–04/2000 Special Research contract: *Progetto e prototipazione di un'architettura behavior based per robot autonomi*, Politecnico di Milano, Department of Electronics and Information (Milan, Italy).
- 10/1999–11/1999 Special Research contract: *Sviluppo sistema per l'analisi di algoritmi di apprendimento*, Politecnico di Milano, Department of Electronics and Information (Milan, Italy).

OTHER ACTIVITIES

- 11/2001–05/2002 Technical revision of the Italian translation of *Unix manuale per l'amministratore di sistema - terza edizione* by Nemeth Evi, Snyder Garth, Seebass Scott, Hein Trent, Pearson Education Italia, 2002.
- 09/2000–02/2001 Technical revision of the Italian translation of *The Java Programming Language - Third Edition* by Ken Arnold, James Gosling, David Holmes, Addison-Wesley Italia, 2001.
- 04/2000–08/2000 Italian Translation and technical revision of *Exceptional C++* by Herb Sutter, Addison-Wesley Italia, 2000.

AWARDS AND PRIZES

- 2007–2008 Winner of the Research Grant on “Brain-Computer Interfaces in Everyday Applications” from Politecnico di Milano and Regione Lombardia (within the program “Grant di Avvio alla Ricerca - Accordo di Collaborazione tra il Politecnico di Milano e la Regione Lombardia”)
- 2003 Winner of *Chorafas Prize* for the PhD. Thesis from the Chorafas Foundation (Berne, Switzerland).
- 2002–2003 Winner of the grant “Giovani Ricercatori” from Politecnico di Milano on *Adattività in ambienti dinamici tramite transductive learning e boosting*.
- 2001–2002 Winner of an *Ambassadorial Scholarship* from Rotary Foundation.

RESEARCH PROJECTS, GRANTS, AND FUNDINGS

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| 2006–2009 | Project Coordinator in the Sixth Framework Program of <i>RAWSEEDS: Robotics Advancement through Web-publishing of Sensorial and Elaborated Extensive Data Sets</i> . EU Project FP6-045144 |
| 2007–2008 | Research contract for the research on tools for <i>Product Intelligence</i> with Fondazione Politecnico. |
| 2007–2008 | Research contract for the development of an <i>Studio di fattibilità sistema odometrico basato su sensori ottici</i> with Technopint. |
| 2007–2008 | Research contract for the development of a <i>Neural tool for sport engine diagnosis</i> for an Italian Company (details undisclosed for NDA clause). |
| 2006–2008 | Investigator in the Workpackage <i>Robotic Companion Exploiting Affective Feedback for Modeling Emotional State of the Patient and Adapting the Rehabilitation Treatment</i> of the IIT Funded Project on Rehabilitation within the Politecnico di Milano IIT Unit |
| 2005 | Investigator in the research contract for <i>Caratterizzazione del carico di una lavastoviglie mediante tecniche di Intelligenza Artificiale</i> with Electrolux Home Products Italy. |

PRESENT RESEARCH ACTIVITY

My present research activity is focused on two research areas: Algorithms for Machine Learning (a.k.a. Pattern Recognition, Knowledge Discovering, Data Mining, Soft Computing, etc.) and Autonomous Robots. Machine Learning research activity aims at the development of methods and models for the practical modeling of complex systems through data analysis techniques. Autonomous robots are the most clear example of such kind of systems and a stimulating environment for the application of advanced techniques for adaptiveness, knowledge representation, and control. The goal of my research activity in the long run is to apply, in an effective way, techniques and models from machine learning to autonomous robotics and real world engineering applications. So far, this research effort has led to several achievements and publications that will be described in details in the following sections.

MACHINE LEARNING AND PATTERN RECOGNITION

Research in Machine Learning has produced both theoretical and practical results. I have applied learning methods to several industrial and academic applications, becoming a reference source for this w.r.t. the local research community. Bayesian approaches to model adaptation and learning, development of neural models from biological signals (e.g., age prediction from heart rate variability, sleep staging with HMM, obstructive sleep apnea recognition, lung cancer diagnosis from breath analysis), adaptive color modeling, augmented and alternative language models for user support systems, adaptive models for traffic prediction optimization and modeling, models for anomaly detection are just few examples of this activity in complex system modeling. From a purely theoretical perspective, a few research lines are prominent and are detailed in the following.

Reinforcement Learning and Fuzzy Learning Classifier Systems: the research on learning classifier systems and, in particular, of evolutionary learning of fuzzy rules has led to the development of learning systems able to learn sets of fuzzy rules while interacting with the environment. Main results concern the analysis of reinforcement algorithms for fuzzy rules learning able to deal with real valued input in a more natural way with respect to classical interval based representations.

Bayesian Framework for Evolutionary Learning of Adaptive Models: Being and adaptive model a structured representation of an observed phenomenon or stream of data, the estimation of the parameters in such structure can be seen as the real undergoing process of *machine learning*. The most complex part of modeling complex system by adaptive models is the definition of their structure and thus their complexity. The designer has to introduce his bias to properly model his knowledge and the uncertainty about it. A Bayesian framework can be used for this and my research activity has focused on the use of such Bayesian framework when evolutionary learning adaptive models such as neural networks and learning classifier systems.

Adaptive Models in Human Computer Interaction: human computer interaction can noticeably improve its effectiveness by exploiting adaptive models; this improvement turns to be a tremendous break-through when the user is somehow impaired or suffer from disabilities. My research in this areas has developed stochastic language models for verbal impaired people to provide a symbol prediction aid named CABA²L (Composition Assistant for Bulk Augmented and Augmentative Languages). Now this research is moving forward to the development of tools for Brain Computer Interface and Affective computing.

Information Geometry and Learning Machines: Information geometry is a framework used to represent probability distributions and inference in geometrical terms. My research activity on this topic just started with the aim of understanding learning machine from a geometrical perspective. In particular, the analysis is now focused on the geometrical interpretation of Evolution of Distribution Algorithms for optimization and stochastic optimization in a broader sense.

AUTONOMOUS ROBOTS

Since 2001 I participate to the Milan Robocup Team (MRT). MRT is a Robocup team of six soccer playing robots (both holonomic and non-holonomic), equipped with specifically designed panoramic sensors, color classification algorithms that can adapt classification to changing light conditions, and a conceptual model to integrate robot perception with information coming from teammates. This team of robots is a joint research effort with Università degli Studi di Milano-Bicocca and it sports our research results on robot control architectures, middleware for robot integration, reactive robot control, computer vision and perception, adaptive color models, etc. All these achievements come mainly from the research effort in robot control and perception organized along few main research lines.

Behavior Based Architecture: The behavior of the robots in the MRT is implemented in BRIAN, a system able to manage the interaction among fuzzy behavioral modules through a composition mechanism that is also influenced by conceptual contributes coming from a higher level scheduler. The developed software architecture consists of different modules independently running (in principle also on different machines) and interacting through a middleware that matches the needs of soft real time, physical distribution, and dynamic networking, typical of this application. Technologies here developed are re-used in many different robotics applications. Recently I am moved to more hybrid approaches with the integration of classical techniques such as planning to achieve more intelligent behaviors.

SLAM with vision: Along the line of incremental map building and localization in unknown environments, I developed, in collaboration with Università degli Studi Milano-Bicocca, a complete 6DoF Localization and Simultaneous Localization And Mapping (a.k.a. SLAM) system based on trinocular vision that uses line segments in the environment, hierarchical map decomposition and statistical measure modeling. In particular, I applied my background in statistics and data modeling to various aspects of SLAM especially regarding trinocular vision error modeling, catadioptric cameras, data association and odometry. This research activity is now mature to include single camera perception, multi sensor fusion and moving object tracking algorithms.

Knowledge representation for autonomous robots: In the field of robotics I am also working on fuzzy knowledge models for the high level representation of the environment surrounding an

autonomous robot. This kind of models allow a better architectural integration of reactive and deliberative components while considering uncertainty in the perception and in the modeling.

Message Oriented Middleware for Robotics: Integration when developing complex software systems becomes a key issue. In this direction I have worked, in collaboration with Università degli Studi di Brescia, to the development of DCDT (Device Communities Development Toolkit) a Message Oriented Middleware for component integration that is presently the base for MRT software integration and development.

PAST RESEARCH ACTIVITIES

In the past I have done some research on dimensionality reduction and symbolic programming.

Fractal dimension and Dimensionality Reduction: One of the key issues in damining is dimensionality reduction, many techniques have been proposed in literatures. I have proposed a method based on fractal dimation both to measure the quality of the dimensionality reduction algorithm and suggest the number of componets that should be retained in order to lose the minimum information content.

Demo Theorem Provers: In the past I have done some work in the LISP implementation of simple theorem provers for predicative and modal logics for teaching purposes.

PUBLICATIONS

A. INTERNATIONAL JOURNAL PAPERS

- A1. C. Melchiorre, M. Matteucci, A. Azzoni, A. Zanchi, "Artificial neural networks and cluster analysis in landslide susceptibility zonation", *Geomorphology, Special Issue on GIS Technology and Models for Assessing Landslide Hazard and Risk*, A. Carrara and R. Pike edidors, volume 94, pp 379-400, Springer, 2008. (doi:10.1016/j.geomorph.2006.10.035 available online since 14 June 2007).
- A2. A. Bonarini, M. Matteucci, M. Restell. "Problems and solutions for anchoring in multi-robot applications". *Journal of Intelligent and Fuzzy Systems*, M. Colombetti, G. Gini, and E. Nissan ed., Vol. 18(3), pp 245-254, IOS Press, 2007.
- A3. A. Bonarini, M. Matteucci, M. Restelli. "Learning Fuzzy Classifier Systems: Architecture and Exploration Issues". *International Journal on Artificial Intelligence Tools*, M. Colombetti, G. Gini, and E. Nissan ed., Vol. 16, No. 2, 269-289, Word Scientific, 2007.
- A4. V.D.A. Corino, M. Matteucci, L. T. Mainardi. "Analysis of Heart Rate Variability to Predict-Patient Age in a Healthy Population". *Methods of Information in Medicine*, vol 46, no 2, pp 191-195, 2007.
- A5. V.D.A. Corino, M. Matteucci, L. Cravello, E. Ferrari, A.A. Ferrari, L.T. Mainardi. "Long-term heart rate variability as a predictor of patient age". *Computer Methods and Programs in Biomedicine*, Volume 82, Issue 3, Pages 248-257, June 2006.
- A6. A. Bonarini, M. Matteucci, and M. Restelli. "Concepts and Fuzzy Models for Behavior-Based Robotics", *International Journal of Approximate Reasoning*. 41, pp.110-127, 2006.
- A7. M. Matteucci, D. Spadoni. "Evolutionary Learning of Rich Neural Networks in the Bayesian Model Selection Framework" in *International Journal of Applied Mathematics and Computer Science*, Special Issue: Evolutionary Computation, Carlos Cotta and Robert Shaeffer Editors, Vol. 14, No 3, pages 423-440, University of Zielona Góra, Poland, 2004.

- A8. A. Bonarini, G. Invernizzi, T. H. Labella, M. Matteucci. "An architecture to coordinate fuzzy behaviors to control an autonomous robot" in *Fuzzy Sets and Systems special issue on Fuzzy Set Techniques for Intelligent Robotic Systems*, 134(1), pp 101 - 115, 2003.
- A9. A. Bonarini, C. Bonacina, M. Matteucci. "An approach to the design of reinforcement function in real world, agent based applications" in *IEEE Transactions on Systems, Man, and Cybernetics - Part B*, 31(3), pp 288-301, 2001.

B. PAPERS IN INTERNATIONAL BOOKS

- B1. A. Colombo, M. Matteucci, D.G. Sorrenti. "On the Calibration of Non Single Viewpoint Catadioptric Sensors". In *RoboCup 2006: Robot Soccer World Cup X, Lecture Notes in Computer Science Volume 4434/2007*, 194-205, Springer, Berlin, Germany, 2007.
- B2. R. Blatt, A. Bonarini, E. Calabrò, M. Della Torre, M. Matteucci, U. Pastorino. "Fuzzy K-NN Lung Cancer Identification by an Electronic Nose". In "Applications of Fuzzy Sets Theory", LNAI4578, 261-268, Springer-Verlag, 2007 isbn 978-3-540-73399-7.
- B3. A. Bonarini, M. Matteucci, M. Restelli. "MRT: Robotics Off-the-Shelf with the Modular Robotic Toolkit". In *Software Engineering for Experimental Robotics Series: Springer Tracts in Advanced Robotics*, Vol. 30, Brugali, Davide (Ed.), pp 345-364, 2007.
- B4. A. Bonarini, M. Matteucci, M. Restelli. "Concepts and Fuzzy Models for Behavior-Based Robotics". In Di Gesù V., Masulli F., Petrosino A., *Fuzzy Logic and Applications, Lecture Notes in Computer Science, Volume 2955*, Springer Verlag, Berlin, D, 72-79, 2006.
- B5. F. Anzani, B. Bosisio, M. Matteucci, D.G. Sorrenti. "On-Line Color Calibration in Non-stationary Environments". In *RoboCup 2005: Robot Soccer World Cup IX, LNCS 4020/2006*, Ansgar Bredendfeld and Adam Jacoff and Itsuki Noda and Yasutake Takahashi (Eds.), pages 396-407, Springer, 2006.
- B6. A. Bonarini, D. Lavatelli, M. Matteucci. "A Composite System for Real-Time Robust Whistle Recognition". In *RoboCup 2005: Robot Soccer World Cup IX, LNCS 4020/2006*, Ansgar Bredendfeld and Adam Jacoff and Itsuki Noda and Yasutake Takahashi (Eds.), pages 130-141, Springer, 2006.
- B7. N. Gatti, M. Matteucci. "CABA²L a Bliss Predictive Composition Assistant for AAC Communication Software". *Enterprise Information Systems VI*, I. Seruca, J. Cordeiro, S. Hammoudi, J. Felipe (eds.), Springer, p. 277-284, 2006.
- B8. E. Grillo, M. Matteucci, D.G. Sorrenti. "Getting the Most from Your Color Camera in a Color-Coded World". In D. Nardi et al. (Eds.): *RoboCup 2004, LNAI 3276*, Springer-Verlag Berlin Heidelberg, pp. 221-235, 2005.
- B9. N. Gatti, M. Matteucci, L. Sbattella. "An ICT Aid for Verbal Impaired People: Bliss2003" In J. Klaus, K. Miesenberger, W. L. Zagler, D. Burger(editors) "Computers Helping People with Special Needs, 9th International Conference, ICCHP 2004, Paris, France, July 7-9, 2004, Proceedings", Springer-Verlag, Berlin, Germany, pp. 983-990, 2004.
- B10. A. Bonarini, M. Matteucci, M. Restelli. "Concepts for anchoring in robotics", in F. Esposito (Ed.) *AI*IA 2001 - Advances in Artificial Intelligence, LNCS, Vol. 2175/2001*, Springer Verlag, Berlin (D), pp 327-332, 2001.
- B11. A. Bonarini, G. Invernizzi, F. M. Marchese, M. Matteucci, M. Restelli, D. G. Sorrenti. "Fun2maS: the Milan Robocup Team" in A. Birk, S. Coradeschi (Eds.) *RoboCup 2001 - Robot Soccer World Cup V, LNCS*, Springer Verlag, Berlin (D), 2001.
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