CURRICULUM VITAE ET STUDIORUM

Manuel Roveri

PERSONAL DATA

Name: Manuel
Surname: Roveri
Birth date: September 26, 1976
Birth Place: Milano, Italy
Citizenship: Italian

Office Address
Dipartimento di Elettronica, Informazione e Bioingegneria
Politecnico di Milano
Via Ponzio 34/5
I-20133, Milano (MI), Italy
Telefono: +39 02 2399 3590
Fax: +39 02 2399 3411
Email: manuel.roveri@polimi.it
Home page: http://roveri.faculty.polimi.it

EDUCATION

05/2007 Ph.D. degree in Computer Engineering, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano.

Thesis title: Just-in-Time Adaptive Classifiers.

Advisor: Prof. C. Alippi, Politecnico di Milano, Milano, Italy.

06/2003 Laurea in Computer Engineering, Politecnico di Milano, Milano, Italy; final grade 95/100.

Thesis title: A simulation environment for the concatenated and turbo codes analysis and optimization.

Advisor: Prof. V. Piuri, Politecnico di Milano, Politecnico di Milano, Milano, Italy.

05/2003 Master of Science in Computer Science at the University of Illinois at Chicago (UIC), Chicago, Illinois, USA.

Thesis title: A simulation environment for the concatenated and turbo codes analysis and optimization.

Advisor: Prof. V. Kenyon, University of Illinois at Chicago, Chicago, USA.

ACADEMIC POSITIONS

07/2015- Professore Associato (equivalent to Associate Professor), Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy.

12/2013 Abilitazione Scientifica Nazionale, Sett. 09/H1 – Sistemi di elaborazione delle Informazioni, Seconda Fascia.

4/2011-5/2011 Visiting Researcher, Department of Electrical and Electronic Engineering, Faculty of Engineering, Imperial College London, London (UK). Host: Prof. Erol Gelembe.

12/2008–07/2015 Ricercatore di ruolo MIUR (equivalent to Assistant Professor), Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy.

03/2007–12/2008 Post-doc researcher, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, Italy. Project: "Computational intelligence techniques in adaptive wireless sensor networks and intelligent information processing systems".

10/2003–02/2005 Research Assistant, Dipartimento di Tecnologia dell'Informazione, Università degli Studi di Milano, Milano, Italy. Project: "Analysis and development of optimal allocation algorithms for distributed environmental monitoring agencies".

RESEARCH ACTIVITY

The research activity addresses the design of methodologies, techniques and solutions for adaptive and intelligent information processing systems able to interact proactively with the environment and react and adapt to evolving time-variant situations. In detail, the research focuses on:

- the study and design of intelligent embedded and cyber-physical systems, i.e., embedded and cyber-physical systems inheriting intelligent mechanisms proper of human cognition;
- the investigation and design of adaptive computational-intelligence techniques;
- the deployment of credible networked intelligent embedded and cyber-physical systems able to operate in harsh environments.

These research activities are strictly related and integrated and can be intended within a research cycle. The research on adaptive computational-intelligence techniques provides novel intelligent mechanisms making embedded and cyber-physical systems adaptive and able to interact with the environment. The research on intelligent embedded and cyber-physical systems provides novel strategies and solutions to design networked intelligent embedded and cyber-physical systems able to interact with the environment and adapt to evolving time-varying situations. Finally, the "from the lab to the real world" research activity

on the deployment of networked intelligent embedded and cyber-physical systems in harsh environmental conditions identifies novel research challenges to be addressed both at the theory and system level.

Intelligent Embedded and Cyber-physical Systems

The research aims at addressing methodological and application-related aspects of intelligent embedded and cyber-physical systems, i.e., embedded and cyber-physical systems endowed with computational intelligence and cognition abilities allowing them to deal with a pervasive uncertainty and learn from acquired data. Wireless Sensor Networks, complex sensor/actuator networks and hybrid systems are examples of the classes of embedded and cyber-physical systems considered in the research. More specifically, the research activity focuses on the design of methodologies and algorithms granting

- the processing system to implement adaptation and robustness mechanisms. For example, fault diagnosis is a relevant aspect of this research activity enabling mechanisms to face the insurgence of hardware and software faults. In particular, cognitive fault diagnosis systems have been designed to carry out the identification and isolation tasks by exploiting temporal and spatial dependencies in acquired datastreams;

- the units to expose intelligent distributed mechanisms for identifying variations in the environment and in the interaction of the technology with the environment. Hierarchical and distributed change detection tests have been designed to detect changes directly from incoming data and adapt the system to the new operating conditions;

- the ability to execute smart energy management mechanisms for intelligent embedded and cyber-physical systems. Designed solutions aim at maintaining the Quality-of-Service and prolong the life-time of the systems by means of energy-aware local routing protocols and adaptive sensor sampling mechanisms as well as supporting a remote reconfiguration of the network units within a distributed framework.

Particular attention has been also devoted to the design and the development of networked intelligent embedded and cyber-physical systems with sensor capability by addressing applications characterized by a large impact on the Society and able to operate in harsh environments. This “from the Lab to the Real world” research activity is described in the Section “Deployment of credible networked intelligent embedded and cyber-physical systems”.

Adaptive Computational-Intelligent Techniques

The research addresses theoretical, implementation and application-related aspects of machine learning/ computational intelligence-based systems, with a specific focus on adaptation mechanisms allowing the system/application to track evolving environments. In order to achieve this goal we need to weaken the stationarity/time invariant hypothesis and develop dynamic management mechanisms based on the available knowledge to allow the adaptive systems to react and track process changes. In turn, this research has requested

- the definition of general purpose solutions able to assess the stationary of a data-generating process and estimate the temporal instant the process generating the data deviates from its nominal state;

- the introduction of the novel concept of “Just-in-time” framework that allows the systems to reconfigure/update in a just-in-time fashion, i.e., exactly when needed, the knowledge base of the systems. The approach represents a form of active learning where a triggering mechanism activates

the response to changes in the process under monitoring (differently from other passive approaches present in the literature that force the continuous update of the application);

- the design of adaptive knowledge-based management systems able to track the process change by activating, whenever appropriate, previously acquired knowledge so as to take advantage of recurrent states.

The above research activity provides the theoretical foundation needed by intelligent embedded and cyber-physical systems described in the previous section, since algorithms and techniques designed to support the aforementioned intelligent systems are here investigated and perfected. Relevant examples of this combined research activity are the development of cognitive fault detection/isolation/identification techniques for sensor networks. These computational intelligence-based techniques allow the system for detecting, isolating and identifying faults affecting units of the network (to provide timely alarms and actuate accommodation procedures) as well as changes in the physical process under monitoring (which require a re-training of the computational intelligence-based system).

In addition, the research addressed the study of a methodology for the high-level synthesis of adaptive information-processing systems endowed with computational intelligent mechanisms. The novelties of these adaptive information-processing systems reside in the ability to work in time-varying environments (hence weakening the stationary hypothesis that is generally assumed in the related literature), the capability to adapt the feature set that is extracted from the data-generating process over time to improve/maintain the Quality of Service of the envisaged application and the ability to create and maintain evolving knowledge in adaptive processing systems. A relevant application scenario for this research activity is the analysis and quality assurance in industrial processes.

Deployment of credible networked intelligent embedded and cyber-physical systems: "From the Lab to the Real world"

The outcomes of the theoretical research activities on intelligent embedded and cyber-physical systems and adaptive computational-intelligence techniques provide novel tools and solutions for the "from the lab to the real world" applied research focusing on the deployment of credible networked embedded and cyber-physical systems.

A credible deployment in a harsh environment sets the basics for identifying the real needs that an intelligent embedded/cyber-physical system must expose. In this direction, we designed and deployed a set of systems where some basic intelligent mechanisms show to be fundamental to grant a Quality of Service in harsh environmental conditions. Remarkably, this "from the Lab to the Real world" activity is fundamental since it sets the challenges both at the technological and methodological level that need to be addressed by the research community at the basic research level.

A robust, adaptive, solar powered WSN-based framework for marine environment monitoring has been deployed in Queensland, AUS (Nov. 2007) for monitoring the underwater light and temperature. All aspects of the environmental monitoring system such as sensing activity, local transmission (from sensor nodes to gateways), remote transmission (from the gateways to the control center), data storage and visualization have been addressed to guarantee robustness and adaptability to network changes.

A real-time monitoring system for rock collapse forecasting that exploits MEMS accelerometers and geophones (in addition to traditional sensors such as strain-gauges, tiltmeters, flowmeters) for non-invasive detection of micro-acoustic bursts associated with the formation and the evolution of cracks within the rocks has been designed and developed. This system has been deployed in several critical areas of the Italian-Swiss Alps (and systems are still active): S. Martino Mountain (April 2010-present); Torrioni di Rialba (July 2010-present); Val Canaria, Ticino, Switzerland (August 2011-present); Gallivaggio (July 2012-present). The proposed monitoring system relies on a network of intelligent embedded systems characterized by high-frequency sampling hybrid wireless-wired architectures tailored to detect and –hopefully- localize

micro-acoustic emissions in the rock face, yet maintaining an high energy-efficiency by means of effective energy management policies and sophisticated adaptive energy harvesting mechanisms.

An intelligent landslide monitoring system based on a wireless network of intelligent embedded systems has been designed and developed. This system has been considered to investigate critical areas of Italian Alps: Torrioni di Rialba (July 2011-present); Premana (August 2012- present). Aspects related to intelligent power management, remote units reconfigurability, remote code upload and effective data storage, aggregation and visualization have been considered and addressed in this research.

A novel GSM-based system for tracking bird's movement has been designed and developed. Following the Internet-of- things vision, the proposed system is composed by a set of lightweight and energy-efficient GSM-based tracking devices to be deployed on birds, one (or more) receiver(s) and a set of analysis/storage servers, hence supporting an Internet-of- Birds approach. The novel idea characterizing the proposed tracking system is the use of the GSM technology for both localization and transmission. The proposed GSM-based tracking system has been tested in a real deployment on four greater flamingos (*Phoenicopterus roseus*) for approximately 11 months in Northern Italy.

The design, implementation and deployment of sophisticated networked intelligent embedded and cyber-physical systems required a high degree of cross-disciplinarity with continuous discussions with biologists, geologists and geophysicists. The interaction with phenomenon experts represented a challenging activity that, despite the communication difficulties, lead to the design and development of effective monitoring systems.

PUBLICATIONS

INTERNATIONAL JOURNALS

A1. C. Alippi and M. Roveri, "The (Not) Far-Away Path to Smart Cyber-Physical Systems: An Information-Centric Framework," in *IEEE Computer*, vol. 50, no. 4, pp. 38-47, April 2017.

A2. C. Alippi, S. Ntalampiras and M. Roveri, "Model-Free Fault Detection and Isolation in Large-Scale Cyber-Physical Systems," in *IEEE Transactions on Emerging Topics in Computational Intelligence*, vol. 1, no. 1, pp. 61-71, Feb. 2017.

A3. M. Roveri, F. Trovò, "An Ensemble Approach for Cognitive Fault Detection and Isolation in Sensor Networks", International Journal of Neural Systems, vol. 27, no. 3, pp. 16, 2017.

A4. C. Alippi, R. Fantacci, D. Marabissi, M. Roveri, "A Cloud to the Ground: The New Frontier of Intelligent and Autonomous Networks of Things", IEEE Communication Magazine, Vol.54, No 12, pp. 14-20, December 2016.

A5. G. Boracchi, M. Michaelides, M. Roveri, "A cognitive monitoring system for detecting and isolating contaminants and faults in intelligent buildings", IEEE Transactions on Systems, Man, and Cybernetics: Systems, Accepted, 2016.

A6. S. Brienza, M. Roveri, D. De Guglielmo, G. Anastasi, "Just-in-Time Adaptive Algorithm for Optimal Parameter Setting in 802.15.4 WSNs", ACM Transactions on Autonomous and Adaptive Systems (TAAS), vol. 10, no. 4, 2016.

A7. C. Alippi; G. Boracchi; M. Roveri, "Hierarchical Change-Detection Tests", IEEE Transactions on Neural Networks and Learning Systems, Accepted, 2016.

A8. C. Alippi, M. Bocca, G. Boracchi, N. Patwari, M. Roveri, RTI Goes Wild: Radio Tomographic Imaging for Outdoor People Detection and Localization, IEEE Transactions on Mobile Computing, vol. 15, no. 10, pp. 2585-2598, 2016.

A9. Alippi, G. Boracchi and M. Roveri, "A Reprogrammable and Intelligent Monitoring System for Rock-Collapse Forecasting," in IEEE Systems Journal, vol. 10, no. 2, pp. 733-744, June 2016.

A10. M. À. Cugueró-Escofet, J. Quevedo, C. Alippi, M. Roveri, V. Puig, D. García and F. Trovò, "Model- vs. data-based approaches applied to fault diagnosis in potable water supply networks", Journal of Hydroinformatics, vol. 18, no. 6, 2016

A11. Buoncristiano, G. Mecca, E. Quintarelli, M. Roveri, D. Santoro, and L. Tanca, "Database Challenges for Exploratory Computing", SIGMOD Rec. Vol. 44, No. 2, pp. 17-22, August 2015

A12. G. Ditzler, M. Roveri, C. Alippi and R. Polikar, "Learning in Nonstationary Environments: A Survey," in *IEEE Computational Intelligence Magazine*, vol. 10, no. 4, pp. 12-25, Nov. 2015.

A13. C. Alippi, M. Roveri, F. Trovò, "A Self-building and Cluster-based Cognitive Fault Diagnosis System for Sensor Networks", IEEE Transactions on Neural Networks and Learning Systems, Vol. 25, No. 6, pp. 1021-1032, June 2014.

A14. C. Alippi, G. Boracchi, M. Roveri, "Ensembles of Change-Point Methods to Estimate the Change Point in Residual Sequences", Soft Computing, Springer, Vol. 17, No. 11, pp. 1971-1981, Nov. 2013.

A15. C. Alippi, S. Ntalampiras, M. Roveri, "A Cognitive Fault Diagnosis System for Distributed Sensor Networks", IEEE Transactions on Neural Networks and Learning Systems, Vol. 24, No. 8, pp. 1213-1226, Aug. 2013.

A16. C. Alippi, R. Camplani, C. Galperti, A. Marullo, M. Roveri, "A high frequency sampling monitoring system for environmental and structural applications", ACM Transactions on Sensor Networks, Vol. 9, No. 4, Art. 41, 32 pages, July 2013.

A17. C. Alippi, G. Boracchi, M. Roveri, "Just In Time Classifiers for Recurrent Concepts", IEEE Transactions on Neural Networks and Learning Systems, Vol. 24, No. 4, pp. 620 – 634, April 2013. *This paper received the 2016 IEEE CIS Outstanding TNNLS Paper Award from the IEEE Computational Intelligence Society.*

A18. C. Alippi, G. Boracchi, M. Roveri, "A just-in-time adaptive classification system based on the intersection of confidence intervals rule", Neural Networks, Elsevier, Vol. 24, No. 8, pp. 791-800, Oct. 2011.

A19. C. Alippi, R. Camplani, C. Galperti, M. Roveri, "A robust, adaptive, solar powered WSN framework for aquatic environmental monitoring", IEEE Sensors Journal, Vol. 11, No. 1, pp. 45-55, Jan. 2011.

A20. C. Alippi, G. Boracchi, R. Camplani, M. Roveri, "Detecting External Disturbances on Camera Lens in Wireless Multimedia Sensor Networks", IEEE Transactions on Instrumentation and Measurement, Vol. 59, No. 11, pp. 2982-2990, Nov. 2010.

A21. C. Alippi, G. Anastasi, M. Di Francesco, M. Roveri, "An Adaptive Sampling Algorithm for Effective Energy Management in Wireless Sensor Networks with Energy-hungry Sensors", IEEE Transactions on Instrumentation and Measurement, Vol. 58, No. 11, pp. 335 – 344, Nov. 2009.

A22. C. Alippi, R. Camplani, M. Roveri, "An Adaptive, LLC-based and Hierarchical Power-aware Routing Algorithm", IEEE Transactions on Instrumentation and Measurement, Vol. 58, No. 9, pp. 3347-3357, Sept. 2009.

A23. C. Alippi, G. Anastasi, M. Di Francesco, M. Roveri, "Energy Management in Wireless Sensor Networks with Energy-Hungry Sensors", IEEE Instrumentation and Measurement Magazine, Vol. 12, No. 2, pp. 16-23, April 2009.

A24. C. Alippi, M. Roveri, "Just-in-time Adaptive Classifiers. Part II. Designing the classifier", IEEE Transactions on Neural Networks, Vol. 19, No. 12, pp. 2053 – 2064, Dec. 2008.

A25. C. Alippi, M. Roveri, "Just-in-time Adaptive Classifiers. Part I. Detecting non-stationary Changes", IEEE Transactions on Neural Networks, Vol. 19, No. 7, pp. 1145 – 1153, July 2008.

A26. F. Amigoni, N. Gatti, C. Pinciroli, M. Roveri, "What Planner for Ambient Intelligence Applications?", IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans, Vol. 35, No. 1, pp. 7–21, Jan. 2005.

ITALIAN JOURNALS

I1. A. Capone, M. Cesana, M. Roveri, "Gli oggetti nel futuro di Internet", Rivista AEIT, n. 11/12, Nov./Dec. 2012.

BOOK CHAPTERS

B1. F. A. Schreiber and M. Roveri, "Sensors and Wireless Sensor Networks as data sources: models and languages", Data Management in Pervasive Systems - Springer Cham, Heidelberg, pp.69-92, 2015.

B2. C. Alippi, R. Camplani, A. Marullo, M. Roveri, "Algorithms and Tools for Intelligent Monitoring of Critical Infrastructure Systems", Intelligent Monitoring, Control, and Security of Critical Infrastructure Systems, Studies in Computational Intelligence, Springer Berlin Heidelberg, Vol. 565, pp. 167-184, 2015.

B3. C. Alippi, G. Boracchi, G. Ditzler, R. Polikar, M. Roveri, "Adaptive Classifiers for Nonstationary Environments", Contemporary Issues in Systems Science and Engineering, IEEE/Wiley Press Book Series, 2015.

B4. C. Alippi, G. Boracchi, M. Roveri, "Above and below the ocean surface: a WSN framework for monitoring the Great Barrier Reef", Building Sensor Networks: From Design to Applications, CRC Press, pp. 271- 290, Sept. 2013.

B5. C. Alippi, G. Boracchi, R. Camplani, M. Roveri, "Wireless Sensor Networks for Monitoring Vineyards", Methodologies and Technologies for Networked Enterprises, Lecture Notes in Computer Science, LNCS 7200, pp. 295-310, July 2012.

B6. C. Alippi, R. Camplani, A. Marullo, M. Roveri, "A Real-Time Monitoring Framework for Landslide and Rock-Collapse Forecasting", Smart Sensing Technology for Agriculture and Environmental Monitoring, Lecture Notes in Electrical Engineering, Springer, Vol. 146, pp. 285-302, 2012.

B7. C. Alippi, A. Marullo, M. Roveri, "Nuovi Sistemi di Monitoraggio: Infrastrutture di Acquisizione e di Trasmissione Dati", MIARIA Tecnologia e Conoscenza al Servizio della Sicurezza, Bellavite Ed., Vol. 1, 2011.

B8. C. Alippi, R. Camplani, C. Galperti, M. Roveri, "From labs to real environments: the dark side of WSNs", Recent Advances in Sensing Technology Series: Lecture Notes in Electrical Engineering, Springer Verlag, Vol. 49, pp. 143-168, 2009.

B9. C. Alippi, M. Roveri, G. Vanini, “Robustness in Neural Networks”, Encyclopedia of Information Science and Technology, 2nd ed., Ed. Information Science Reference, Hershey - New York, Vol. 7, pp. 3314-3321, 2008.

PUBLICATIONS AT INTERNATIONAL CONFERENCES

C1. S. Disabato, M. Roveri, “Reducing the Computation Load of Convolutional Neural Networks through Gate Classification”, Accepted for publication at the 2018 International Joint Conference on Neural Networks (IJCNN), 2018.

C2. C. Alippi, S. Disabato, M. Roveri, “Moving Convolutional Neural Networks to Embedded Systems: the AlexNet and VGG-16 case”, 2018 ACM/IEEE International Conference on Information Processing in Sensor Networks Porto (IPSN 2018), Portugal, April 11-13, 2018.

C3. C. Alippi, M. Roveri, I. Scarabottolo, “A spectrum-based adaptive sampling algorithm for smart sensing”, IEEE 3rd International Conference on Smart World Congress (SmartWorld 2017), At San Francisco, USA, 4-8 August 2017.

C4. C. Alippi, V. D'Alto, M. Falchetto, D. Pau and M. Roveri, "Detecting changes at the sensor level in cyber-physical systems: Methodology and technological implementation," 2017 International Joint Conference on Neural Networks (IJCNN), Anchorage, AK, 2017, pp. 1780-1786.

C5. C. Alippi, W. Qi, M. Roveri, “Learning in Nonstationary Environments: A Hybrid Approach”, International Conference on Artificial Intelligence and Soft Computing, 703-714.

C6. C. Alippi, R. Ambrosini, D. Cogliati, V. Longoni, M. Roveri, "A lightweight and energy-efficient Internet-of-Birds Tracking System", IEEE International Conference on Pervasive Computing and Communications (PerCom 2017), Hawaii, USA, 13-17 March 2017.

C7. C. Alippi, S. Ntalampiras and M. Roveri, “Designing HMM Models in the Age of Big Data”, INNS Conference on Big Data, October 23-25, 2016, Thessaloniki, Greece, 2016. This paper won the Best Regular Paper Award.

C8. G. Tacconelli, M. Roveri, “A CPM-based Change Detection Test for Big Data”, INNS Conference on Big Data, October 23-25, 2016, Thessaloniki, Greece, 2016.

C9. C. Alippi, G. Boracchi, D. Carrera, M. Roveri, “Change Detection in Multivariate Datastreams: Likelihood and Detectability Loss”, in Proc. International Joint Conference of Artificial Intelligence (IJCAI) 2016, New York, USA, July 9 – 13

C10. C. Alippi, S. Ntalampiras and M. Roveri, “Online Model-free Sensor Fault Identification and Dictionary Learning in Cyber-Physical Systems”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2016), July 24 – 29, 2016, Vancouver, Canada.

C11. M. Roveri, C. Alippi and W. Qi, “An improved Hilbert-Huang Transform for non-linear and time-variant signals”, in Proc. 26th Italian Workshop on Neural Networks (WIRN 2015), May 18-20, 2016, Vietri Sul Mare, Italy

C12. M. Roveri, G. Boracchi, M. P Michaelides, “Detecting Contaminants in Smart Buildings by Exploiting Temporal and Spatial Correlation” in Proc. 2015 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2015), Dec. 7-10, 2015, Cape Town, South Africa.

C13. M. Roveri and F. Trovò, "Making Intelligent the Embedded Systems through Cognitive Outlier and Fault Detection", in Proc. 25th Italian Workshop on Neural Networks (WIRN 2015), May 20-22, 2015, Vietri Sul Mare, Italy

C14. M. Buoncristiano, G. Mecca, E. Quintarelli, M. Roveri, D. Santoro and L. Tanca, “Exploratory Computing: What is there for the Database Researcher?” accepted for publication at the 23rd Italian Symposium on Advanced Database Systems (SEBD 2015), June 14-17, Gaeta, Italy.

C15. C. Alippi, M. Roveri, F. Trovò, “Learning Causal Dependencies to Detect and Diagnose Faults in Sensor Networks”, in Proc. 2014 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2014), Dec. 9-12, 2014, Orlando, Florida.

C16. A. Antola, L. Mezzalira, M. Roveri, “GINGER: a minimizing-effects reprogramming paradigm for distributed sensor networks”, in Proc. 2014 IEEE International Symposium on Robotic and Sensors Environments (IEEE ROSE 2014), Oct. 16-18, Timisoara, Romania.

C17. M. Roveri, F. Trovò, “An Ensemble of HMMs for Cognitive Fault Detection in Distributed Sensor Networks”, in Proc. 10th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2014), Sep. 19-21, Rhodes, Greece.

C18. G. Boracchi, M. Michaelides, M. Roveri, “A Cognitive Monitoring System for Contaminant Detection in Intelligent Buildings”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2014), July 6 – 11, 2014, Beijing, China.

C19. G. Boracchi, M. Roveri, “Exploiting Self-Similarity for Change Detection”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2014), July 6 – 11, 2014, Beijing, China.

C20. G. Boracchi, M. Roveri, “A Reconfigurable and Element-wise ICI-based Change-Detection Test for Streaming Data”, in Proc. IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (IEEE CIVEMSA 2014), May 5-7 2014, Ottawa, Ontario, Canada

C21. S. Ntalampiras, M. Roveri, "Rock Collapse Forecasting: a Novel Approach Based on the Classification of Micro-Acoustic Signals in the Wavelet Domain", in Proc. IEEE SENSORS Conference (IEEE SENSORS 2013), Baltimore, USA, Nov. 3-6, 2013.

C22. S. Brienza, D. De Guglielmo, C. Alippi, G. Anastasi, M. Roveri, "A Learning-based Algorithm for Optimal MAC Parameters Setting in IEEE 802.15.4 Wireless Sensor Networks", in Proc. ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks (ACM PE-WASUN 2013), Barcelona, Spain, Nov. 3-7, 2013.

C23. G. Boracchi, V. Puig, M. Roveri, “A Hierarchy of Change-Point Methods for Estimating the Time Instant of Leakages in Water Distribution Networks”, in Proc. Workshop on Learning strategies and data processing in nonstationary environments (LEAPS 2013), Paphos, Cyprus, Sept. 30 - Oct. 2, 2013.

C24. C. Alippi, S. Ntalampiras, M. Roveri, "Model ensemble for an effective on-line reconstruction of missing data in sensor networks", in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2013), Dallas, USA, Aug. 4-9, 2013.

C25. J. Quevedo, C. Alippi, M.A. Cuguero, S. Ntalampiras, V. Puig, M. Roveri, D. Garcıa, “Temporal/Spatial Model-Based Fault Diagnosis vs. Hidden Markov Models Change Detection Method: Application to the Barcelona Water Network”, in Proc. Mediterranean Conference on Control and Automation (MED’13), Crete, Greece, June 25-28, 2013.

C26. C. Alippi, G. Boracchi, V. Puig, M. Roveri, “An Ensemble Approach to Estimate the Fault-Time Instant”, in Proc. IEEE International Conference on Intelligent Control and Information Processing (IEEE ICICIP 2013), Beijing, China, June 9 - 11, 2013.

C27. C. Alippi, R. Camplani, M. Roveri, G. Viscardi, "NetBrick: a high-performance, low-power hardware platform for wireless and hybrid sensor network", in Proc. IEEE International Conference on Mobile Ad hoc and Sensor Systems (IEEE MASS 2012), Las Vegas, USA, Oct. 8-11, 2012

C28. C. Alippi, M. Roveri, F. Trovò, "A ''learning from models'' cognitive fault diagnosis system", in Proc. ENNS International Conference on Artificial Neural Networks (ICANN 2012), Lausanne, Swizerland, Sept. 11-14, 2013.

C29. C. Alippi, G. Boracchi, M. Roveri, "On-line reconstruction of missing data in sensor/actuator networks by exploiting temporal and spatial redundancy", in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2012), Brisbane, Australia, June 10-15, 2012.

C30. C. Alippi, S. Ntalampiras, M. Roveri, "An HMM-based change detection method for intelligent embedded sensors", in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2012), Brisbane, Australia, June 10-15, 2012.

C31. C. Alippi, G. Boracchi, M. Roveri, "Just-In-Time Ensemble of Classifiers", in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2012), Brisbane, Australia, June 10-15, 2012.

C32. T. Mahmoodi, M. Roveri, “Identifying network failure via detecting changes in power profile", in Proc. IEEE Pervasive Computing and Communications Workshops (IEEE PERCOM Workshops), pp. 758-763, Lugano, Switzerland, March 23, 2012.

C33. C. Alippi, R. Camplani, M. Roveri, L. Vaccaro, “REEL: a real-time, computationally-efficient, reprogrammable framework for Wireless Sensor Networks“, in Proc. IEEE Sensors Conference (IEEE SENSORS 2011), Limerik, Ireland, Oct. 28-31, 2011.

C34. C. Alippi, G. Boracchi, A. Marullo, M. Roveri, “A Step Towards the Prediction of a Rock Collapse: Analysis of Micro-Acoustic Bursts“, in Proc. IEEE Sensors Conference (IEEE SENSORS 2011), Limerik, Ireland, Oct. 28-31, 2011.

C35. C. Alippi, G. Boracchi, M. Roveri, “An Effective Just-in-Time Adaptive Classifier for Gradual Concept Drifts”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2011), San Jose, USA, July 31 – Aug. 5, 2011.

C36. C. Alippi, G. Boracchi, M. Roveri, “A Hierarchical, Nonparametric Sequential Change-Detection Test“, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2011), San Jose, USA, July 31 – Aug. 5, 2011.

C37. C. Alippi, G. Boracchi, M. Roveri, “A distributed Self-adaptive Nonparametric Change-Detection Test for Sensor/Actuator Networks”, in Proc. ENNS International Conference on Artificial Neural Networks (ICANN 2011), Espoo, Finland, June 14-17, 2011. Lecture Notes in Computer Science, Vol. 6792/2011, pp. 173-180, 2011.

C38. C. Alippi, R. Camplani, C. Galperti, A. Marullo, M. Roveri, “An hybrid wireless-wired monitoring system for real-time rock collapse forecasting”, in Proc. IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS 2010), San Francisco, USA, Nov. 8-12, 2010.

C39. C. Alippi, G. Boracchi, M. Roveri, “Adaptive Classifiers with ICI-based Adaptive Knowledge Base Management”, in Proc. ENNS International Conference on Artificial Neural Networks (ICANN 2010), Thessaloniki, Greece, Sept. 15-18, 2010.

C40. C. Alippi, G. Boracchi, M. Roveri, “Change Detection Tests Using the ICI rule”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2010), Barcelona, Spain, July 18-23, 2010.

C41. C. Alippi, M. Roveri, “Virtual k-fold cross validation: an effective method for accuracy assessment”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2010), Barcelona, Spain, July 18-23, 2010.

C42. C. Alippi, G. Boracchi, M. Roveri, "Detecting Drops on Lens in Wireless Multimedia Sensor Network Nodes", in Proc. IEEE International Workshop on RObotic and Sensors Environments (IEEE ROSE 2009), pp. 128-133, Lecco, Italy, Nov. 6-7, 2009.

C43. C. Alippi, R. Camplani, M. Roveri, "A Virtual Machine for energy management in WSNs", in Proc. IEEE International Workshop on RObotic and Sensors Environments (IEEE ROSE 2009), pp. 173-177, Lecco, Italy, Nov. 6-7, 2009.

C44. C. Alippi, G. Boracchi, M. Roveri, "Just in time classifiers: managing the slow drift case", in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2009), Atlanta, USA, June 14-16, 2009.

C45. C. Alippi, G. Baroni, A. Bersani, M. Roveri, "Unsupervised feature selection algorithms for Wireless Sensor Network", in Proc. IEEE International Conference on Computational Intelligence for Measurement Systems and Applications (IEEE CIMSA 2009), Hong Kong, China, May 11-13, 2009.

C46. C. Alippi, R. Camplani, C. Galperti, M. Roveri, “Effective design of WSNs: from the lab to the real world”, in Proc. IEEE International Conference on Sensing Technology (IEEE ICST 2008), Tainan, Taiwan, Nov 30 - Dec 3, 2008.

C47. C. Alippi, M. Fuhrman, M. Roveri, “k-NN classifiers: investigating the k = k(n) relationship”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2008), Hong Kong, June 1-6, 2008.

C48. C. Alippi, R. Camplani, C. Galperti, M. Roveri, L. Sportiello, “Towards a credible WSNs deployment: a monitoring framework based on an adaptive communication protocol and energy-harvesting availability”, in Proc. IEEE International Instrumentation and Measurement Technology Conference (IEEE I2MTC 2008), pp. 66-71, Victoria, Canada, May 12-15, 2008.

C49. C. Alippi, R. Camplani, M. Roveri, “A Hierarchical LLC Routing Algorithm for WSNs”, in Proc. IEEE International Workshop on RObotic and Sensors Environments (IEEE ROSE 2007), pp. 1-6, Ontario, Canada, Oct. 12-13, 2007.

C50. C. Alippi, G. Anastasi, C. Galperti, F. Mancini, M. Roveri, “Adaptive Sampling for Energy Conservation in Wireless Sensor Networks for Snow Monitoring Applications”, in Proc. IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS 2007), pp. 1 – 6, Pisa, Italy, Oct. 8-11, 2007.

C51. C. Alippi, M. Roveri, “Adaptive Classifiers in Stationary Conditions”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2007), pp. 1008 – 1013, Orlando, USA, Aug. 12-17, 2007.

C52. C. Alippi, M. Roveri, “Just-in-Time Adaptive Classifiers in Non-Stationary Conditions”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2007), pp. 1014 - 1019, Orlando, USA, Aug. 12-17, 2007.

C53. C. Alippi, M. Roveri, “Reducing Computational Complexity in k-NN based Adaptive Classifiers”, in Proc. International Conference on Computational Intelligence for Measurement Systems and Applications (IEEE CIMSA 2007), pp. 68 – 71, Ostuni, Italia, June 27-29, 2007.

C54. C. Alippi, G. Pelosi, M. Roveri, “Computational intelligence techniques to detect toxic gas presence”, in Proc. International Conference on Computational Intelligence for Measurement Systems and Applications (IEEE CIMSA 2006), pp. 40 – 44, La Coruna, Spain, July 12-14, 2006.

C55. M. Gamassi, M. Roveri, F. Scotti, V. Piuri, “Genetic Techniques for Pattern Extraction in Particle Boards Images”, in Proc. International Conference on Computational Intelligence for Measurement Systems and Applications (IEEE CIMSA 2006), pp. 129 - 134, La Coruna, Spain, July 12-14, 2006.

C56. C. Alippi, M. Roveri, “A computational intelligence-based criterion to detect non-stationarity trends”, in Proc. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2006), pp. 5040-5044, Vancouver, Canada, July 16-21, 2006.

C57. C. Alippi, M. Roveri, “An adaptive cusum-based test for signal change detection”, in Proc. IEEE International Symposium on Circuits and Systems (IEEE ISCAS 2006), pp. 5752 – 5755, Kos, Greece, May 21-24, 2006.

C58. V. Piuri, M. Roveri, F. Scotti, “Visual Inspection of Particle Boards for Quality Assessment”, in Proc. IEEE International Conference on Image Processing (IEEE ICIP 2005), Vol. 3, pp. 521 – 524, Genova, Italy, Sept. 11-14, 2005.

C59. C. Alippi, F. Pessina, M. Roveri, “An Adaptive System for Automatic Invoice-Documents Classification”, in Proc. IEEE International Conference on Image Processing (IEEE ICIP 2005), Vol. 2, pp. 526 - 529, Genova, Italy, Sept. 11-14, 2005.

C60. V. Piuri, M. Roveri, F. Scotti, “Computational Intelligence in Industrial Quality Control”, in Proc. IEEE International Workshop on Intelligent Signal Processing (IEEE WISP 2005), pp. 4 – 9, Faro, Portugal, Sept. 1-3, 2005.

C61. N. Bianchessi, V. Piuri, G. Righini, M. Roveri, G. Laneve, A. Zigrino, “An optimization approach to the planning of Earth observing satellites ”, in Proc. International Workshop on Planning and Scheduling for Space, pp. 207-212, Darmstadt, Germany, June 23-25, 2004.

C62. V. Piuri, M. Roveri, “A Simulation Environment for Concatenated and Turbo Codes Analysis and Optimization”, in Proc. IEEE Midwest Symposium On Circuits and Systems (IEEE MWCAS 2003), Vol. 3, pp. 1210-1212, Cairo, Egypt, Dec. 27-30, 2003.

SCIENTIFIC ACTIVITIES

INTERNATIONAL ACTIVITIES

- Associate Editor of the IEEE Transactions on Neural Networks and Learning Systems (since 2013-)
- Guest Editor of the IEEE Transactions on Neural Networks and Learning Systems - Special Issue on "Recent Advances in Theory, Methodology and Applications of Imbalanced Learning," 2018.
- Chair of the IEEE Computational Intelligence Society (CIS) Neural Networks Technical Committee (2017-2018).
- Chair of the IEEE CIS Task Force on Intelligent Cyber-Physical Systems (2017).
- Member of the IEEE CIS Technical Committee on Smart World (2017)
- Member of the IEEE CIS Technical Committee on Data Mining and Big Data Analytics (2017-2018)

- Chair of the IEEE Computational Intelligence Society Pre-College Activities Subcommittee (2016-2017)
- Chair of the IEEE Computational Intelligence Society Student Activities Subcommittee (2014-2015)
- Travel Grants Administrator of the IEEE Computational Intelligence Society in (2012 -2013)
- Member of the IEEE Computational Intelligence Society Subcommittee on Webinars (2014-2015)
- Member of the IEEE Computational Intelligence Society Subcommittee on Research Grants (2012 - 2016)
- Member of the IEEE Computational Intelligence Society Subcommittee on Student Activities (2012-2013,2016,2017)
- Member of the IEEE Computational Intelligence Society Subcommittee on Young Professional (2015-2018)
- Expert evaluator for the Austrian R&D funding programme "ICT of the Future" at the Austrian Research Promotion Agency FFG (2016-2017)

CONFERENCE ACTIVITIES

- *Program Co-Chair* of the 4th IEEE Conference on Internet of People (IoP 2018), October 8-12, 2018, Guangzhou, China
- *Publication Chair* of the 2018 IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE (IEEE WWCI 2018), Rio de Janeiro, Brazil, 2018.
- *Workshop Co-Chair* of the 2018 IEEE Smart World Congress, October 8-12, 2018, Guangzhou, China
- *Publicity Chairs* of the 12th World Congress on Intelligent Control and Automation (WCICA 2016), Guilin, China, June 12-15, 2016.
- *Sponsors & Exhibits Co-Chair* of the 2015 IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2015), Killarney, Ireland, July 12-17, 2015.
- *Publication Chair* of the 2015 IEEE International Conference on Information Science and Technology (ICIST 2015), Changsha, China, April 24–26, 2015.
- *Poster Session Chair* of the 2014 IEEE World Congress on Computational Intelligence (IEEE WCCI 2014), which has been held in Beijing, China, July 6 – 11, 2014.
- *Co-organizer* of the IEEE Symposium on "Computational Intelligence for Embedded and Cyberphysical Systems" (IntECS 2015), which will be held within the IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2015), Cape Town, South Africa, Dec. 7-10, 2015
- *Co-organizer* of the IEEE Symposium on "Intelligent Embedded Systems" (IES 2014) held within the IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2014), Orlando, USA, Dec. 9-12, 2014
- *Co-organizer* of the Workshop on "Learning strategies and data processing in nonstationary environments" (LEAPS 2013), which has been held within the IFIP Artificial Intelligence Applications and Innovations Conference (AIAI 2013), Paphos, Cyprus, Sep. 30 - Oct. 2, 2013.

- *Liaison for Distributed & Collective Intelligence* at the 2011 IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2011).

- *Publicity chair* at the 2011 IEEE International Symposium on Neural Networks (IEEE ISNN 2011).

- *Local Arrangements chair* at the 2009 IEEE International Workshop on Robotic and Sensors Environments (IEEE ROSE 2009).

- *Registration Chair* at the 2009 ENNS International Conference on Artificial Neural Networks (ENNS ICANN 2009).

- *Co-organizer* of the Special Session on "Concept Drift, Domain Adaptation and Learning in Dynamic Environments" at the 2015 IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2015) and at 2014 IEEE World Congress on Computational Intelligence (IEEE WCCI 2014).

- *Co-organizer* of the Special Session on "Intelligent Cyber-physical and Embedded System" at 25th Italian Workshop on Neural Networks (WIRN 2015).

- *Organizer* of the Special Session on "Intelligent Embedded Systems" at the 2011 IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2011) and *co-organizer* of the Special Session on "Intelligent Embedded Systems" at 2012 IEEE World Congress on Computational Intelligence (IEEE WCCI 2012) and at the 2013 IEEE International Joint Conference on Neural Networks (IJCNN 2013).

- *Co-organizer* of the Workshop on "Concept Drift & Learning in Non-Stationary Environments" at the 2011 IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2011).

- *TPC member* of the following events:

    - 15th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC 2018)
    - IEEE International SmartWorld Congress (IEEE SmartWorld) in 2017
    - International Conference on Artificial Intelligence and Soft Computing (ICAISC) in 2017
    - IJCAI 2017 Workshop on Learning in the Presence of Class Imbalance and Concept Drift (LPCICD'17) in 2017;
    - IEEE International Instrumentation and Measurement Technology Conference (IEEE I2MTC) in 2017-2015, 2014, 2012 and 2011.
    - IEEE Symposium Series on Computational Intelligence (IEEE SSCI) in 2016, 2015.
    - International Symposium on Neural Networks (IEEE ISNN) in 2016, 2015 and 2012.
    - IEEE International Workshop on Machine Learning for Signal Processing (MLSP) in 2016
    - International Joint Conference on Artificial Intelligence (IJCAI) in 2015
    - IEEE International Conference on Intelligent Control and Information Processing (IEEE ICICIP) in 2013 and 2016.
    - World Congress on Intelligent Control and Automation (WCICA) in 2016
    - International Conference on Advanced Computing and Intelligent Engineering (ICACIE) in 2016
    - International Conference on Computing in Mechanical Engineering (ICCME) in 2015
    - International Conference on Information Science and Technology (ICIST) in 2015
    - Italian Workshop on Neural Networks (WIRN) in 2015
    - IEEE International Joint Conference on Neural Networks (IEEE IJCNN) in 2014, 2013 and 2011.
    - International Conference on Artificial Neural Network (ICANN) in 2018, 2014, 2010 and 2009.
    - International Conference on Signal Image Technology & Internet Based Systems (SITIS) in 2015 and 2014.
    - International Conference on Advances in Computing, Communications and Informatics (ICACCI) in 2016,2015.

- IFIP International Conference on Artificial Intelligence Applications and Innovations (AIAI) in 2016, 2015, 2014, 2013, 2012, 2011.
- International Symposium on Intelligent Systems Technologies and Applications (ISTA) in 2017 and 2016.
- IEEE International Symposium on RObotic and Sensors Environments (ROSE) in 2014.
- International Workshop on Computational Energy Management in Smart Grids (CEMiSG) in 2014.
- International Workshop on Incremental Classification, concept drift and Novelty detection (ICIaNOV) in 2014.
- Special Session on "Incremental learning and novelty detection methods and their applications" held at the European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN 2014) in 2014.
- International Conference on Neural Computation Theory and Applications (NCTA/IJCCI) in 2017-2015, 2013, 2012, 2011, 2010.
- IEEE Symposium on Computational Intelligence in Dynamic and Uncertain Environments (IEEE CIDUE) in 2013.
- Workshop on Incremental clustering, concept drift and novelty detection (IclaNov) in 2013
- IEEE International Conference on Smart Instrumentation, Measurement and Applications (IEEE ICSIMA) in 2013.
- Workshop on Active and Incremental Learning held at the European Conference on Artificial Intelligence (AIL-ECAI) in 2012.
- IEEE CIS Summer School on Computational Intelligence – Theory and Applications (SS-CITA) in 2014, 2015.
- Asian Conference on Intelligent Information and Database Systems (ACIIDS) in 2016

NATIONAL ACTIVITIES

- *Member of the technical committee* of the "Osservatorio Artificial Intelligence" of the Politecnico di Milano (Dipartimento di Elettronica, Informazione e Bioingegneria, Dipartimento di Ingegneria Gestionale) in 2017.

- *Member of the technical committee* of the "Osservatorio Internet of Things" of the Politecnico di Milano (Dipartimento di Elettronica, Informazione e Bioingegneria, Dipartimento di Ingegneria Gestionale and MIP) in 2012 and 2013.

- *Member of the Commission for Industry 4.0 of the* Dipartimento di Elettronica, Informazione e Bioingegneria in 2018.

INVITED AND PLENARY TALKS

- Talk on "Internet of Smart Things: where machine learning meets embedded systems" at the 6th Edition of ASTDay: Innovation Domains in IoT, Milano (Italy), February 22, 2018

- Talk on "IoT and AI: l'unione fa la forza", Convegno Smart Home dell'Osservatorio Internet of Things, Politecnico di Milano, Milano (Italy), February 16, 2018

- Talk on "From machine learning to learning machines (and back)" at the AMD and Supermicro event organized by Digital4Biz, Rome (Italy), November 22, 2017

- Talk on "From machine learning to learning machines (and back)" at the Intel and Supermicro event organized by Digital4Biz, Milano (Italy), September 27, 2017

- Talk on “Sfide ed opportunità del mondo cyber-fisico” at Technology Hub – Elettronica e IoT Hub, Milano (Italy), June 7, 2016
- Seminar and Demo on “Intelligent Cyber-Physical Systems based on self-adaptive heterogeneous sensor technological platform” at STMicroelectronics, Agrate (Italy), Nov. 19, 2015
- Invited Talk entitled “Intelligence for Embedded and Cyber-physical Systems: from Theory to Practice” at STMicroelectronics, Agrate (Italy), May 15, 2015
- Plenary Talk at the IEEE-Sponsored 5th International Conference on Soft Computing and Pattern Recognition (IEEE SoCPaR 2014). The title of the talk was “Intelligence for Embedded Systems”
- Speaker at the 2014 IEEE CIS / REGIM-Lab. Summer School on Computational Intelligence – Theory and Applications (SS-CITA’2014). The topic of the talk was “Supervised learning in stationary and non-stationary environments”
- Invited Talk entitled “Intelligent Embedded Systems” at Larus Technologies, Ottawa (Canada), May 7, 2014
- Invited Talk entitled “Learning models in nonstationary environments: the Just-In-Time approach” at the Workshop on Active and Incremental Learning held at 20th European Conference on Artificial Intelligence, Montpellier, France, August 27-31, 2012

PANELIST

- Panelist at the Panel on “Machine Learning and Big Data: Where do they fit in CPS?” organized at 2018 ACM/IEEE International Conference on Information Processing in Sensor Networks Porto (IPSN 2018), Portugal, April 11-13, 2018.

PARTICIPATION TO BOARDS OF EXAMINERS

- Member of the “Board of Examiners of ELECTRONICS AND COMMUNICATIONS” for the award of the title of research doctor in ELECTRONICS AND COMMUNICATIONS ENGINEERING - Politecnico di Torino, Italy, Jan. 16, 2015

REVIEWER FOR INTERNATIONAL JOURNALS

- IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Computers, IEEE Transactions on Instrumentation and Measurement (outstanding reviewer mention in 2008), ACM Transactions on Embedded Computing Systems, IEEE/ACM Transactions on Networking, Elsevier Pattern Recognition, Elsevier Ad Hoc Networks, Elsevier Neural Networks, Elsevier Neurocomputing, Elsevier Computational Statistics and Data Analysis, AI Communications, IOS Press, Wireless Communications and Mobile Computing, Wiley, Journal of Aerospace Engineering, ACSE.

GRANT

- Recipient of the NVIDIA GPU Grant for the project “Jetson EmbEdded Platform for Fog Computing (JEEP)” from NVIDIA Corporation in 2017.

AWARDS

- The Outstanding Computational Intelligence Magazine Paper Award from the IEEE Computational Intelligence Society in 2018 for the paper "Learning in Nonstationary Environments: A survey", by Gregory Ditzler, Manuel Roveri, Cesare Alippi and Robi Polikar, IEEE Computational Intelligence Magazine, vol. 10, no. 4, pp. 12-25, Nov. 2015

- The Outstanding Transactions on Neural Networks and Learning Systems Paper Award from the IEEE Computational Intelligence Society in 2016 for the paper "Just-in-Time Classifiers for Recurrent Concepts" by C. Alippi, G. Boracchi and M. Roveri, IEEE Transactions on Neural Networks and Learning Systems, Vol. 24, No. 4, pp. 620 – 634, April 2013.

- The Best Regular Paper Award at the International Neural Network Society Conference on Big Data in 2016 for the paper "Designing HMM Models in the Age of Big Data" by C. Alippi, S. Ntalampiras and M. Roveri, INNS Conference on Big Data, October 23-25, 2016, Thessaloniki, Greece, 2016.

- "Outstanding reviewer of 2008" from the IEEE Instrumentation and Measurement Society

PARTICIPATION TO ITALIAN/EU PROJECTS

- **iSENSE** (EU STREP project) Years: 2011-2013 - Role within the project: Coordination of the research activity for Politecnico di Milano

  The aim of the project was to develop an intelligent data processing framework for analyzing and interpreting data collected from systems of systems comprising sensor and actuator networks such that faults are promptly detected, isolated, identified and accommodated for in future decisions or actions. In particular, the research activity I coordinated focused on the design and development of cognitive fault diagnosis systems able to exploit temporal and spatial functional dependencies among acquired datastreams to improve fault detection, isolation and identification in complex sensor/actuator networks.

- **MIARIA** (INTERREG EU project Italy-Switzerland) Years: 2009-2012 - Role within the project: Co-coordinator of the research activity for Politecnico di Milano

  The project focused on the design of innovative distributed systems for the collection and transmission of environmental data –and commands back- to a second-generation monitoring control room, the subsequent data aggregation and analysis for designing dynamic risk maps in alpine environments subject to hydrogeological risks. In particular, the research activity I co-coordinated focused on the design and development of novel hybrid architectures and hardware platforms, adaptive and intelligent mechanisms, robust communication protocols, and efficient energy management solutions.

  The technological outcomes of this project are the design and development of a rock collapse forecasting system that has been deployed in several critical areas of the Italian-Swiss Alps (Torrioni di Rialba, July 2010; Ticino, Switzerland, August 2011; Gallivaggio, July 2012) and the design and

development of an intelligent landslide monitoring system that has been deployed in critical slopes of the Italian Alps (Torrioni di Rialba, July 2011; Premana, August 2012).

- **Checkpoint integrato** (Settore strategico ICT – Founded by the Region of Lombardy) Years: 2012-2014 - Role within the project: Coordinator of the research activity for Politecnico di Milano

  The aim of the project is the design and development of a new generation of security checkpoints, called "Integrated Checkpoint", where different technological solutions for the detection of hazardous materials (e.g., explosives) both in luggage and on people coexist and cooperate. The main characteristic of the integrated checkpoint is the capability to exploit all these technological solutions to improve the efficiency and the effectiveness of the monitoring action. Within this project, the research activity I coordinated focused on the design, the development and the testing of advanced algorithms for the detection of explosives based on computational intelligence techniques and novel filtering solutions to improve the signal-to-noise ratio.

- **SEMAT** (Italian-Australian Project) Years: 2007-2009 - Role within the project: Researcher

  The project aimed at developing an environmental monitoring framework for the monitoring of the underwater luminosity and temperature, information necessary to derive the health status of the coral reef as well as providing quantitative indications related to cyclone formations in tropical areas. In particular, my involvement in the research activity focused on the design and development of a WSN–based solution characterized by energy harvesting, robustness with respect to a large class of perturbations and real-time adaptation to network topology variations.

  The technological outcome of this project was the design and development of a wireless sensor network-based system for the monitoring of aquatic environments that has been deployed in Queensland, AUS (Nov. 2007).

- **PROMETEO** (Politecnico di Milano strategic research project) Years: 2007-2009 - Role within the project: Researcher

  Prometeo was a strategic research project of Politecnico di Milano focusing on civil protection and homeland security (public protection) topics. The project, which involved a relevant number of partners from 8 departments, aimed on our side at studying and developing ICT-based methodologies and technologies for risk prevention and emergency management. Within this project, my research activity focused on the design of ad-hoc innovative devices and sensors, advanced algorithms for image and signal processing and emergency and monitoring rooms of second generation.

  The technological outcome of this project is the design and development of a rock collapse forecasting system that has been deployed on the S. Martino Mountain, April 2010.

FUNDINGS AND CONTRACTS

- Research contract for the "Study and Testing of the accelerometric behavior of vacuum pumps" with PVR Vacuum Design s.r.l. (2018). Value of the contract: 10K euro. Role: Project Coordinator

- Research contract for the "Event detections for Intelligent Monitoring enabled by Artificial Neural Networks applied to client-server architectures featuring multiple X-NUCLEO sensors" with STMicroelectronics S.r.l. (2016). Value of the contract: 30K euro. Role: Project Coordinator

- Research collaboration for the "Design and development of tracking devices for migratory animals" with Università Degli Studi Di Milano - Bicocca (2016). Value of the contract: 3K euro. Role: Project Coordinator

- Research contract for the "Technology transfer and support to the design of classification systems based on computational intelligence solutions (deep learning) for logistics applications" with MecTho s.r.tl (2016). Value of the contract: 20K euro. Role: Project Co-Coordinator

- Research contract for the "Development of embedded systems endowed with online and secure reprogramming mechanisms" with Res.En. s.r.l. (2013). Value of the contract: 25K euro. Role: Project Coordinator

- Research contract for the "Development of embedded systems for sensor readings in environmental monitoring applications" with Res.En. s.r.l. (2012). Value of the contract: 15K euro. Role: Project Coordinator

TEACHING ACTIVITIES

COURSES

- A.A. 2017/18, "Computing Infrastructures" Corso di Laurea in Ingegneria Informatica, Politecnico di Milano.
- A.A. 2017/18, "Informatica e Elementi di Informatica Medica" Corso di Laurea in Ingegneria Biomedica, Politecnico di Milano.
- A.A. 2017/18 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2016/17, "Informatica e Elementi di Informatica Medica" Corso di Laurea in Ingegneria Biomedica, Politecnico di Milano.
- A.A. 2016/17 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2016/17, "Intelligence for Embedded Systems" in the Ph.D. program in Information Technology, Politecnico di Milano, Milano, Italy.
- A.A. 2015/16, "Informatica e Elementi di Informatica Medica" Corso di Laurea in Ingegneria Biomedica, Politecnico di Milano.
- A.A. 2015/16 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2014/15, "Intelligence for Embedded Systems" in the Ph.D. program in Information Technology, Politecnico di Milano, Milano, Italy.
- A.A. 2014/15 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2013/14 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2012/13 - "Informatica Grafica" - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.

- A.A. 2011/12 - “Informatica Grafica” - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2010/11 - “Informatica Grafica” - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.
- A.A. 2009/10 - “Informatica Grafica” - Corso di Laurea in Ingegneria Edile – Architettura, Scuola di Ingegneria Edile-Architettura, Politecnico di Milano.

TEACHING ASSISTANTSHIPS

- A.A. 2014/15 – Lectures on *Data-Driven Fault Detection/Diagnosis* for the course “Dependable Systems” (Prof. C. Bolchini) - Corso di Laurea in Ingegneria Informatica – Scuola di Ingegneria Industriale e dell'Informazione - Politecnico di Milano.
- A.A. 2014/15 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria Industriale e dell'Informazione - Politecnico di Milano.
- A.A. 2013/14 – Lectures on *Data-Driven Fault Detection/Diagnosis* for the course “Dependable Systems” (Prof. C. Bolchini) - Corso di Laurea in Ingegneria Informatica – Scuola di Ingegneria Industriale e dell'Informazione - Politecnico di Milano.
- A.A. 2013/14 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria Industriale e dell'Informazione - Politecnico di Milano.
- A.A. 2012/13 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2011/12 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2010/11 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2009/10 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2008/09 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2008/09 – Lectures on *Scheduling Algorithms for real-time systems* for the course “Informatica Industriale” (Prof. N. Gatti) - Corso di Laurea in Ingegneria dell’Automazione - Facoltà di Ingegneria dell’Informazione, Politecnico di Milano.
- A.A. 2007/08 – Lectures on *C Language* for the course “Informatica A” (Prof. C. Alippi) - Corso di Laurea in Ingegneria della Produzione Industriale – Scuola di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2007/08 – Lectures on *Scheduling Algorithms for real-time systems* for the course “Informatica

Industriale" (Prof. N. Gatti) - Corso di Laurea in Ingegneria dell'Automazione - Facoltà di Ingegneria dell'Informazione, Politecnico di Milano.

TUTORING ACTIVITIES

- A.A. 2008/09 – Tutor for the laboratory of the course "Informatica A (per gestionali)" (Prof.ssa O. Mejri) - Corso di Laurea in Ingegneria Gestionale - Facoltà di Ingegneria dei Sistemi - Politecnico di Milano.
- A.A. 2006/07 – Tutor for the Matlab laboratory of the course "Analisi Matematica 1 (PER IL SETTORE DELL'INFORMAZIONE)", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.
- A.A. 2006/07 – Tutor for the Matlab laboratory of the course "Analisi Matematica B (PER IL SETTORE DELL'INFORMAZIONE)", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.
- A.A. 2006/07 – Tutor for the Matlab laboratory of the course "Analisi Matematica 2", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.
- A.A. 2005/06 – Tutor for the Matlab laboratory of the course "Analisi Matematica 1 (PER IL SETTORE DELL'INFORMAZIONE)", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.
- A.A. 2005/06 – Tutor for the Matlab laboratory of the course "Analisi Matematica B (PER IL SETTORE DELL'INFORMAZIONE)", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.
- A.A. 2005/06 – Tutor for the Matlab laboratory of the course "Analisi Matematica 2", Facoltà di Ingegneria, Campus Leonardo, Politecnico di Milano, Milano, Italia.

OTHER TEACHING ACTIVITIES

- PhD Student Advisor at Politecnico di Milano
  - *Francesco Trovò*, 2012-2014
    Thesis Title: "COGNITIVE FAULT DIAGNOSIS FOR SENSOR NETWORKS"
    Final Degree: LODE

- PhD Student Co-Supervisor at the *Alta Scuola Politecnica*, Politecnico di Milano – Politecnico di Torino
  - *Ario Sadafi*, 2015 - end

- Tutor of a Master Student enrolled in a Stage in ST Microelectronics – Agrate (MI), Italy (April 2015 - October 2015) on "Time-varying Neural Networks for heterogeneous sensing systems"

- Reviewer of 1 PhD thesis for the Politecnico di Torino (Jan. 2015)

- Advisor/Co-Advisor of more than 10 Bachelor/Master Theses at Politecnico di Milano

- Reviewer of more than 10 Theses at Politecnico di Milano

- Reviewer of 1 Ms Thesis for the UNIVERSITY OF LUGANO - ALaRI INSTITUTE

Milano, Italy

May 25, 2018

Manuel Roveri

Autorizzo il trattamento di questi dati ai sensi della normativa vigente (675/96 e succ. modificazioni e integrazioni)

Autorizzo il Politecnico di Milano a pubblicare il presente curriculum sul sito WEB di Ateneo, ai fini istituzionali e in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 "Decreto trasparenza" come modificato dal D. Lgs. 97 del 2016"