

BRIEF CURRICULUM VITAE AND STUDIORUM¹

PROF. CESARE ALIPPI

EDUCATION AND ACADEMIC POSITION

Cesare Alippi was

1985-1990 M.Eng *Summa cum Laude*, Electrical Engineering, Politecnico di Milano, Milan, Italy.

1990 - 1992: *Research Fellow*, Dep. Computer Science, University College London, London, UK.

1993: *Honorary Researcher*, Dep. Computer Science, University College London, London, UK.

1991-1995 *Ph.D* in Computer and Control Engineering, Politecnico di Milano, Milan, Italy.

April - July 1994: *Visiting Scholar*, Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, USA

1996 - 1998: *Research Scientist*, Italian National Research Council, Italy.

1998 - 2002: *Associate Professor*, Dip. Elettronica e Informazione, Politecnico di Milano, Italy.

2002 - : *Full Professor* in Information Processing Systems, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Italy.

2010: *Frédéric Joliot-Curie Fellowship*, École Supérieure de Physique et de Chimie Industrielles, Paris, France

July 2012 – June 2013: *Research collaborator*, Università Svizzera Italiana, Lugano, Switzerland

July-September 2012: *Visiting Professorship for Senior International Scientists*, Chinese Academy of Sciences, China

April-October 2013: *Visiting Professorship for Senior International Scientists*, Chinese Academy of Sciences, China

February 2014: *Short Term Visit Professor*, Institute for Infocomm Research (I²R), A*STAR, Singapore

2014: *Lecturer*, Università Svizzera Italiana, Lugano, Switzerland

2016 -: *Full Professor in Cyber-physical and embedded systems*, Università Svizzera Italiana, Switzerland

April 2016-March 2017: *Visiting Professor*, Kobe University, Japan

¹ For further details please refer to Prof. Alippi's web page
<http://home.dei.polimi.it/alippi/>

RESEARCH ACTIVITY

Critical infrastructures, distributed sensor/actuators systems, social networks and public protection applications are examples of systems characterized by high complexity and production of big and uncertain data. As such, solutions designed to address specific applications require sophisticated mechanisms to grant data handling and process understanding, robustness and resilience abilities, capacity to detect changes in nonstationary and adapt to concept drift, self-awareness to diagnose a fault and self-healing mechanisms to repair it as well as support remote controllability and reprogrammability of the solution.

Moreover, we neither can further accept strong hypotheses that make the mathematics amenable at the cost of loss in effectiveness and applicability nor decouple the design of an intelligent cyber-physical system from reality and its implementation and deployment.

A multidisciplinary approach is needed at the system/system of systems level requiring the introduction of intelligence and adaptation abilities directly in the design phase of the solution. Here, machine learning and computational intelligence are precious tools, combined with traditional techniques, to address and solve the above aspects yielding credible solutions, transferable to industry.

Machine learning techniques have been constituting the leitmotiv of the study and lead to the design of intelligent systems and smart solutions to not-trivial problems and real-world applications.

My research goes in the above outlined direction by coupling machine learning mechanisms with adaptive processing systems so as to deliver a new generation of intelligent systems characterised by self-healing, decision making and adaptation abilities.

Current ongoing research addresses issues related to machine learning in non-stationary and evolving environments and intelligent embedded systems; research is carried out both at academic and industrial level. More in detail,

Adaptive Intelligent Systems

The current research focuses on the theory, implementation and applications of learning machines embedding adaptation mechanisms. Results and developed methodologies shed light on the structural and functional properties underlying such complex systems as well as address the performance/constraints trade-off when an application is envisioned.

Efforts are devoted to nonparametric change detection tests designed to detect concept drift affecting datastreams. The methods detect changes in sequential data, not necessarily structured, by differentiating changes associated with nonstationarity, faults or model bias within a cognitive framework. Adaptive mechanisms allowing the system to react just in time to the perceived changes, i.e., exactly when it is needed, are also object of the research with a specific focus on classification systems and coding-decoding recurrent machines. Results have been applied to several applications, e.g., explosive and drug detections from X rays imagery, molecular explosive detections, photovoltaic maximum-power-point-tracker energy harvesting, laser welding and cutting, quality analysis applications.

Intelligent Embedded Systems

The research addresses methodological and application-related aspects of Intelligent cyber-physical embedded systems, i.e., embedded systems with sensors and actuators executing computational intelligence algorithms to deal with uncertainty and learn from incoming sensor data. The class of embedded systems known in the literature as Wireless Sensor Networks, Internet of Things, Smart

grids, passive RFID-based and hybrid systems are object of the study. More specifically, aspects related to energy harvesting and storage, energy management (energy-aware routing protocols, unit management, adaptive sampling, dynamic data accuracy acquisitions) and integration of hybrid wired/wireless monitoring systems are envisaged. Particular attention is devoted to credible applications designed and deployed to live in harsh environments with intelligent and decision making abilities. A sophisticated automatic, adaptive, sustainable and reliable wireless monitoring system for marine environment has been deployed in Queensland, AUS, November 2007 and an advanced solution is under deployment at the Fiji Islands (2014-2015). Other applications refer to intelligent embedded systems for rockfall collapse where both traditional and novel sensor are considered. Several top-world still-alive deployments differentiating in the sensor platforms and considered technology are still active and spread out between Italy and Switzerland to monitor catastrophic events as those induced by rockfalls and land slides. Rockfall monitoring: S.Martino Mountain, April 2010 (I); Torrioni di Rialba, July 2010 (I); Val Canaria, Canton Ticino, August 2011 (CH); Gallivaggio, July 2012 (I). Landslide monitoring: Torrioni di Rialba, July 2011(I), Premana, August 2012 (I), Val Canaria, Canton Ticino, September 2012 (CH). Aspects related to intelligent power management, remote units reconfigurability, remote code upload, data security and effective data storage, aggregation and visualization are object of the research.

Application-level analysis, synthesis and diagnosis of embedded systems

The ongoing research addresses application level properties of the computational flow associated with an embedded system and its relationships with low level design aspects. The developed methodologies and theories for analysis, synthesis and diagnosis, based on the theory of learning and randomized algorithms approaches, allow us to fully characterize the nature of the computation with an acceptable complexity. Such information can be used to measure the robustness/sensitivity of the application (analysis phase) in the large, provide design guidelines (synthesis phase) and detect, identify and isolate faults and malfunctioning in embedded systems (diagnosis phase). A theory about probably approximated correct computation, i.e., a theoretical framework based on machine learning characterizing performances of embedded systems working within a perturbed environment has been developed and is being assessed.

AWARDS AND RECOGNITIONS

- 2016 International Neural Network Society *Gabor award*, recognizing achievements in engineering and applications
- 2016 IEEE CIS *Outstanding Transactions on Neural Networks and Learning Systems Paper award* for the paper titled “Just-in-Time Classifiers for Recurrent Concepts” by C.Alippi, G.Boracchi, M.Roveri, IEEE TNLS, 2013.
- *Distinguished Lecturer* of the IEEE Computational Intelligence Society, 2014-2016 term.
- *IBM Faculty Award* 2013 (18.000US\$ award for a research on active learning)
- *Knight of the Italian Republic* for scientific merit (the highest cavalry order of the Nation given by the President of the Italian Republic), 2011
- IEEE Fellow, “*for contributions to robustness and application-level synthesis of embedded information processing systems*”, 2006
- 2003 IEEE Instrumentation and Measurement Society *Outstanding Young Engineer Award* “*In recognition of his leadership in the fields of digital architectural design and neural networks for industrial applications.*”

- IEEE Senior Member, “*for contributions to robustness and application-level synthesis of embedded information processing systems*”, 1999

Plaques

- *Plaque of appreciation* from the IEEE Computational Intelligence Society *in recognition of his leadership and service as General Program Chair*, 2014 IEEE Symposium Series on Computational Intelligence SSCI 2014, Orlando, USA, 2014.
- *Plaque of appreciation* from the IEEE Computational Intelligence Society *in recognition of his leadership and service as Program Chair*, 2014 IEEE International Joint Conference on Neural Networks IJCNN 2014, Beijing, China, 2014.
- *Plaque of appreciation* from the IEEE Computational Intelligence Society *in recognition of his leadership and service as General Chair*, 2012 IEEE International Joint Conference on Neural Networks IJCNN 2012, Brisbane, Australia, 2012.
- *Outstanding service award Plaque* as Program co-Chair of IEEE IJCNN11, San Jose, USA, 2011.

Certificates of appreciation

- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Vice President for Education, IEEE CIS Executive Committee*, 2015-2016.
- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Vice President for Education, IEEE CIS Executive Committee*, 2013-2014.
- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Associate Editor of the IEEE Transactions on Neural Networks*, 2004-2012.
- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Chair of the IEEE CIS Awards Committee*, 2012.
- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Chair of the IEEE CIS Graduate Student research grant sub-committee*, 2011.
- Certificate of appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Associate Editor of the IEEE Neural Networks Transactions*, 2010.
- Certificate of Appreciation from IEEE for dedication and service to the IEEE Computational Intelligence Society as *Chair of the IEEE Neural Networks Technical Committee*, 2009.

INVOLVEMENT IN INTERNATIONAL ORGANIZATIONS

- *Member* of the Administrative Committee (AdCom) of the IEEE Computational Intelligence Society (CIS), 2017-2019
- *Member* of the Board of Governors of the International Neural Network Society (INNS), 2015-2017

- *Vice-President for Education* of the IEEE Computational Intelligence Society (CIS), 2015-2016
- *Vice-President for Education* of the IEEE Computational Intelligence Society (CIS), 2013-2014
- *Member* of the Administrative Committee (AdCom) of the IEEE Computational Intelligence Society (CIS), 2012-2014
- *Member* of the Board of Directors of the European Neural Network Society (ENNS), 2010-2015
- *Chair* of the IEEE Computational Intelligence Society (CIS) Awards Committee (2012)
- *Co-Editor in Chief*, (Chinese Association for Artificial Intelligence) *CAAI Transactions on Intelligence Technology*, Elsevier (2016-)
- Advisory Board member, *International Journal on Intelligent Information Science and Systems*, Springer (2016-)
- *Member* of the IEEE Frank Ronsenblatt award committee (2011-2013)
- *Associate Editor*, *Neural Networks*, (2016-)
- *Associate Editor*, *IEEE Computational Intelligence Magazine* (2010-2014)
- *Associate Editor*, *IEEE-Transactions on Neural Networks* (2004-2012)
- *Guest Associate Editor*, *IEEE-Transactions Neural Networks & Learning Systems* (2012-13)
- *Associate Editor*, *IEEE-Transactions on Instrumentation and Measurements* (2003-2010)
- *Associate Editor*, (Springer) *Evolving Systems Journal* (2014-)
- *Associate Editor*, (Springer & Science China) *Science China: Information Sciences Journal* (2011-)
- *Associate Editor*, *IEEE/CAA Journal of Automatica Sinica (JAS)*, 2014-
- *Associate Editor*, (Online) *International Journal on Smart Sensing and Intelligent Systems* (2008-)
- *Chair* of the IEEE Technical Committee on Neural Networks of the IEEE Computational Intelligence Society (2008-2010)
- *Co-Chair* of the Technical Committee TC-22 Intelligent Measurement Systems of the IEEE Instrumentation and Measurement Society (2004-2009)
- *Chair* of the IEEE Computational Intelligence Society (CIS) Research grant sub-committee (2011)
- *Member* of the sub-committee of the IEEE Computational Intelligence Society for the outstanding Early Career Award (2011)
- *Member* of the IEEE Computational Intelligence Society Finance Committee (2009-2013)
- *Member* of the IEEE Technical Committee on Neural Networks of the IEEE Computational Intelligence Society (2011-2013)
- *Member* of the IEEE Technical Committee on Intelligent Systems and Applications of the IEEE Computational Intelligence Society (20109-2013)
- *Member* of the IEEE Computational Intelligence Society awards committee (2009-2010)
- *Member* of the CIS Students grant 2009
- *Vice-Chair* of the IEEE Technical Committee on Neural Networks of the IEEE Computational Intelligence Society (2007-2008)
- *Vice-Chair* of the EU COST Action IC0806 –Intelligent Monitoring, Control and Security of Critical Infrastructure Systems (since 2009-2013)
- *Voting representative* of the IEEE I&M Society in the Administrative Committee of the IEEE Neural Networks Society 2003-2004

Conference activity (Only recent and relevant)

- *General Chair*: ICIC2016 (Lanzhou, China); IEEE ICIST 2015 (Changsha, China), IEEE SSCI15-IES (Orlando, USA); ICICIP 2013 (Beijing, China); IEEE IJCNN 2012 (the largest world-wide event in the field, Brisbane, AUS); IEEE HAVE 2009 (Lecco, Italy); IEEE ROSE 2009 (Lecco, Italy); IEEE CIMSAs 2009 (Hong Kong, HK);
- *General Program Chair*: IEEE SSCI 2014 (Orlando, USA)
- *Program Chair*: IJCNN 2014 (the largest world-wide event in the Neural Networks field, Beijing, China), Beijing; ISNN 2011 (Guilin, China), ICANN 2009 (the major European Neural Networks event, Limassol, Cyprus);
- *Program Co-Chair*: IEEE IJCNN 2011 (the largest Neural Networks event world-wide, San Jose', USA); IEEE IMS 2005 (Orlando, USA);
- *Regional chair*: WCICA 2016 (Guilin, China), ICONIP 2017 (Guangzhou, China)
- *Conflict of Interest paper Chair*: World congress on Computational Intelligence 2016 (Vancouver, Canada)
- *Plenary Chair*: IJCNN17 (Anchorage, USA), ISNN 2012 (Shenyang, China)
- *Special Session Chair*, IEEE WCCI2018 (Rio de Janeiro, Brazil)
- *Keynotes/plenaries*: ICACI17 (Doha, Qatar), ICAISC17 (Zakopane, Poland), LA-CCI16 (Cartagena, Colombia), ICRCICN16 (Kolkata, India), WCICA16 (Guilin, China), IJCNN15 (invited talk, Killarney, Ireland); WIRN15 (Vietri, Italy); IJCCI14 (Rome, Italy); IDEAL14 (Salamanca, Spain); ICATET14 (Jaipur, India); BICS13 (Beijing, China), ISNN13 (Dalian, China), M2M 2012 (Taipei, Taiwan), IWACI 2010 (Suzhou, China); IEEE ICST 2009 (Tainan, Taiwan); IEEE ROSE 2007 (Ottawa, Canada);
- *Steering or Advisory board Committee*: ISNN 2010; IEEE CIMSAs 2005-2012, IEEE CIVEMSA 20013-, FANCO15, IEEE WCI15 (Kanpur, India), IEEE ICRCICN 2016 (Kolkata, India)
- *Regional chair*: WCICA 2016 (Guilin, China)
- *Program Committee member*: tens of events

Alippi has organised several special sessions and workshops in IEEE international conferences (e.g., IEEE ISCAS, IEEE-INNS IJCNN, IEEE IMTC, IEEE SSCI)

SOME FIGURES

MONOGRAPHS: 1 (SINGLE AUTHOR)

PATENTS: 4+1 REGISTERED

INTERNATIONAL JOURNALS: 60

NATURE: 1 (SCIENTIFIC REPORTS)

IEEE TRANSACTIONS: 39 (5 AS A SINGLE AUTHOR)

(TNN(LS) 11, TIM 8, TCAS 5, TSMC 3, TCAD 2, TC 2, TVLS 1, TCPM 1, TNS 1, SEN 1, SYS1, TMC 1, TCYB1, TETCI 1)

ACM TRANSACTIONS: 1 (TOSN 1)

IEEE MAGAZINES: 9

(I&M 5; CIM 1; COMPUTERS 2, COMMUNICATIONS 1)

NEURAL NETWORKS: 1

NEUROCOMPUTING: 2

OTHERS: 7

EDITED BOOKS AND BOOK CHAPTERS

EDITED BOOKS: 6
BOOK CHAPTERS: 13
GUEST EDITOR, SPECIAL ISSUES 5
(IEEE TIM, NEURAL NETWORKS, IEEE TNNLS, NEUROCOMPUTING,
COMPUTATIONAL INTELLIGENCE MAGAZINE)
CONFERENCE/WORKSHOP PAPERS: 130+
JOURNAL PAPERS UNDER REVIEW: 3
FUNDING: ALIPPI COORDINATED PROJECTS FOR MORE THAN 4.500.000 EUROS

TEACHING ACTIVITY

Alippi has taught tens of courses in Computer Sciences at Politecnico di Milano, e.g., “Fundamentals of Computer Sciences”, “Information Processing systems”, “Intelligent Embedded Systems” both at undergraduated and graduated levels.

SELECTED PUBLICATIONS

MONOGRAPH

C.Alippi, Intelligence for Embedded Systems: a Methodological approach, Springer, 2014, pp. 283

EDITED BOOKS

C.Alippi, M.Polycarpou, Handbook on Computational Intelligence, Part D: Neural Networks, Springer, 2015

D. Liu, C. Alippi, D. Zhao, H. Zhang, Frontiers of Intelligent Control and Information Processing, World Scientific Publishing, Singapore, 2014

Liu, D.; Alippi, C.; Zhao, D.; Hussain, A. (Eds.), *Advances in Brain Inspired Cognitive Systems*, Vol. 7888, 6th International Conference, BICS 2013 Beijing, China, June 9-11, Proceedings, Springer 2013

J.Liu, C.Alippi, B. Bouchon-Meunier, G. W. Greenwood, H. A. Abbass, *Advances in Computational Intelligence*, Vol. 7311, Edited book of the *plenary/invited lectures* delivered at the IEEE World Congress on Computational Intelligence WCCI 2012, Brisbane, Australia, June 2012, Springer 2012

D. Liu, H. Zhang, M. Polycarpou, C. Alippi, and H. He, Editors, *Advances in Neural Networks - ISNN2011*, Berlin: Springer, 2011, 3 Volumes

C.Alippi, M.M. Polycarpou, C.Panayiotou, G.Ellinas, Editors, *Artificial Neural Networks -ICANN 2009*, Springer 2009, 2 Volumes

INTERNATIONAL TOP JOURNALS (co-authored papers)

F.M.Bianchi, L.Livi , C.Alippi, R.Jenssen, Multiplex visibility graphs to investigate recurrent neural networks dynamics, Nature-Scientific reports, accepted 2017

C.Alippi, M.Roveri, *The (not) far away path from smart cyber-physical systems: an information-centric framework*, IEEE Computers Magazine, accepted 2017

L.Livi , F.M.Bianchi, C.Alippi, *Determination of the edge of criticality in echo state networks through Fisher information maximization*, IEEE Transactions on Neural Networks and Learning Systems, accepted, 2016

C.Alippi, S.Ntalampiras, M.Roveri, *Model-free fault detection and isolation in large-scale cyber-physical systems*, IEEE Transactions on Emerging Topics in Computational Intelligence, 2016

F.M.Bianchi, L.Livi, C.Alippi, *Investigating echo state networks dynamics by means of recurrence analysis*, IEEE Transactions on Neural Networks and Learning Systems, accepted, 2016

L. Bo, C.Alippi, D.Zhao, A Pdf-free Change Detection Test Based on Density Difference Estimation, IEEE Transactions on Neural Networks and Learning Systems, accepted, 2016

L.Livi, C. Alippi, *One-class classifiers based on entropic spanning graphs*, IEEE Transactions on Neural Networks and Learning Systems, accepted, 2016

S.B. Gee, K.C. Tan, C. Alippi, *Solving Multiobjective Optimization Problems in Unknown Dynamic Environments: An Inverse Modeling Approach*, IEEE Transactions on Cybernetics, accepted, 2016

M. A. Cugueró-Escofet, J. Quevedo, C. Alippi, M. Roveri, V. Puig, D. García, F. Trovò, *Model- vs. data-based approaches applied to fault diagnosis in potable water supply networks*, Journal of Hydroinformatics, 2016

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

C. Alippi, G. Boracchi, M. Roveri, *Hierarchical Change-Detection Tests*, IEEE Transactions on Neural Networks and Learning Systems, DOI 10.1109/TNNLS.2015.2512714, 2016, pp.1-13

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, 2016, pp. 2585-2598

C. Alippi, G. Boracchi, M. Roveri, *A reprogrammable and intelligent monitoring system for rock collapse forecasting*, IEEE Systems, Vol.10 No.2, 2016.pp.733-744

G. Ditzler, M. Roveri, C. Alippi, R. Polikar, *Adaptive Strategies for Learning in Nonstationary Environments: a Survey*, IEEE Computational Intelligence Magazine, vol. 10, no. 4, pp. 12-25, 2015

C.Alippi, M.Roveri, F.Trovo', *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

C.Alippi, D.Liu, D.Zhao, L.Bu, *Detecting and Reacting to Changes in Sensing Units: the Active Classifier Case*, IEEE Transactions on System, Man, Cybernetics: Systems, Vol. 44, No. 3, pp.353-362, 2014

B.Wang, D.Zhao, C.Alippi, D.Liu, *Dual Heuristic Dynamic Programming for Nonlinear Discrete-Time Uncertain Systems with State Delay*, Neurocomputing, Elsevier, Vol. 134, pp. 222–229, 2014

D. Zhao, Z. Hu, Z. Xiaa, C. Alippi, Y. Zhua, D. Wang, *Full-range Adaptive Cruise Control Based on Supervised Adaptive Dynamic Programming*, Neurocomputing, Elsevier, Volume 125, 11 February 2013, Pages 57-67, ISSN 0925-2312

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, August, 2013

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, pp.1-32, ACM Transactions on Sensor Networks 9, 4, Article 41, 32 pages, 2013.

C.Alippi, G.Boracchi, M.Roveri, *Ensemble of Change-Point Methods to improve the Change Instant Estimate in Residual Sequences*, Soft Computing Journal, Elsevier, Vol. 17, no. 11, pp.1971-1981, 2013

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

C.Alippi, G.Boracchi, M.Roveri *A just-in-time adaptive classification system based on the intersection of confidence intervals rule*, Neural Networks Journal, Elsevier, Vol24, pp. 791-800, 2011

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

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, (pp. 2982- 2990), 59. (2010).

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. 59, Issue 2, Feb. 2010 pp. 335 – 344

C.Alippi, R.Camplani, M.Roveri: *An Adaptive, LLC-based and Hierarchical Power-aware Routing*

Algorithm, IEEE-Transactions on Instrumentation and Measurement. Volume: 58 Issue: 9, pp 3347-3357, Sept. 2009

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. 2, No. 2, pp 16-23, 2009.

C.Alippi, M.Roveri: Just-in-time Adaptive Classifiers. Part II. Designing the Classifier, IEEE Transactions on Neural Networks, Volume 19, Issue 12, 2008, pp.2053 - 2064.

C.Alippi, C.Galperti: An Adaptive System for Optimal Solar Energy Harvesting in Wireless Sensor Network Nodes, IEEE-Transactions on Circuits and Systems: Part I: regular papers, Vol. 55, No. 6, July 2008, pp. 1742 - 1750.

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

C.Alippi, P.Braione: *Classification Methods and Inductive Learning Rules: What we May Learn from Theory* , IEEE-Transactions on Systems, Man, Cybernetics Part C, Vol. 36, No. 5, September 2006, pp. 649 – 655.

C.Alippi, F.Scotti: *Exploiting Application Locality to Design low complexity, Highly Performing and Power Aware Embedded Classifiers*, IEEE-Transactions on Neural Networks, Vol. 17, No. 3, May 2006, pp. 745 - 754

C.Alippi, M.Catelani, A.Fort, M.Mugnaini: *Automated Selection of Test Frequencies for Fault Diagnosis in Analog Electronic Circuits*, IEEE-Transactions on Instrumentation and Measurement, Vol.54.No.3, June 2005, pp 1033-1044.

C.Alippi, A.Giussani, C.Micheletti, F.Roncoroni, G.Stefini, G.Vassena: *GPS and WEBGIS: A Survey Experience in the Mt. everest National Park*, IEEE-Instrumentation and Measurement Magazine, Vol.7.No.4, December 2004, pp 36-43.

C.Alippi, M.Stellini, A.Galbusera: *A high Level Synthesis Methodology for Multidimensional Systems*, IEEE-Transactions on CAD of Integrated Circuits and Systems, Vol. 22, No. 11, November 2003, pp 1457-1470.

C.Alippi, C. De Russis, V.Piuri: *Neural-based Solutions to Control Exhaust Emissions in Automotive Fuel-Injection Systems*, IEEE-Transactions on Systems, Man, Cybernetics, Vol. 33, No. 2, May 2003, pp 259-268.

C.Alippi, M.Catelani, A.Fort, M.Mugnaini: *SBT Soft Fault Diagnosis In Analog Electronic Circuits: A Sensitivity-Based Approach By Randomized Algorithms* , IEEE-Transactions on Instrumentation and Measurement, Vol.51, No.5, October, 2002, pp.1116-1125

M. Catelani, A.Fort, C.Alippi, *A Fuzzy Approach for Soft Fault Detection in Analog Circuits*, Measurement, Elsevier, Vol. 32., No. 1, July 2002, pp.73-83

C.Alippi, V.Piuri, F.Scotti: *Accuracy versus complexity in RBF neural networks*, IEEE Instrumentation & Measurement Magazine, Piscataway (NJ), USA, Vol. 4, No. 1, March 2001, pp. 32-36

C.Alippi, E.Casagrande, V.Piuri, F.Scotti: *Composite Real-Time Image Processing for Railways Track Profile Measurement*, IEEE-Transactions on Instrumentation and Measurement, Vol. 49, No. 3, Piscataway (NJ), USA, June 2000, pp. 559-564.

C.Alippi, V.Piuri: *Neural Modeling of Dynamic Systems with Nonmeasurable State Variables*, IEEE-Transactions on Instrumentation and Measurement, Vol. 48, No. 6, Piscataway (NJ), USA, December 1999, pp. 1073-1080.

C.Alippi, S.Ferrari, V.Piuri, M.Sami, F.Scotti: *New Trends in Intelligent System Design for Embedded and Measurement Applications*, IEEE- Instrumentation & Measurement Magazine, Vol. 2, No. 2, Piscataway (NJ), USA, June 1999, pp.36-44.

C.Alippi, F.Fummi, V.Piuri, M.Sami, D.Sciuto: *Testability Analysis and Behavioural Testing of the Hopfield Neural Paradigm*, IEEE-Transactions on VLSI, Vol.6, No. 3, Piscataway (NJ), USA, September 1998, pp.507-511.

C.Alippi, A.Ferrero, V.Piuri: *Artificial Intelligence for Instruments and Measurement Applications*, IEEE- Instrumentation & Measurement Magazine, Piscataway (NJ), USA, Vol.1, No. 2, June 1998, pp.9-17.

C.Alippi, L.Briozzo: *Accuracy vs. Precision in Digital VLSI Architectures for Signal Processing*, IEEE-Transactions on Computers, Vol. 47, No. 4., Los Alamitos (CA), USA, April 1998. pp. 472-477.

C.Alippi, V.Piuri: *Experimental Neural Networks for Prediction and Identification*, IEEE-Transactions on Instrumentation and Measurement, Vol. 45, No. 2, Piscataway (NJ), USA, April 1996, pp. 670-676.

C.Alippi, V.Piuri, M.G.Sami: *Sensitivity to errors in artificial neural networks: a behavioural approach*, IEEE-Transactions of Circuits and Systems: Part I, Fundamental theory and applications, Vol. 42, No. 6, Piscataway (NJ), USA, June 1995, pp. 358-361.

The Fermi Group: *FERMI- A New Generation of Electronic Modules for Large Data Acquisition Arrays Required by High Energy Physics*, IEEE Transactions on Components, Packaging, and Manufacturing Technology, part B, Vol 17, n. 3, August 1994, pp. 302-309.

J.L.Ribeiro Filho, P.Treleven, C.Alippi: *Genetic-Algorithm Programming Environments*, IEEE-COMPUTER, Vol. 27. No. 6, Los Alamitos (CA), USA, June 1994, pp. 28-43.

SINGLE AUTHORED INTERNATIONAL JOURNAL PAPERS

C.Alippi, *Selecting Accurate, Robust and Minimal Feedforward Neural Networks*, IEEE Transactions on Circuits and Systems: Part I, Fundamental theory and applications. Vol. 49, No. 12, December 2002, pp 1799-1810.

C.Alippi, *A Probably Approximately Correct Framework to estimate Performance Degradation in Embedded Systems*, IEEE-Transactions on CAD of Integrated Circuits and Systems, Vol. 21, No. 7, July 2002, pp. 749-762.

C.Alippi, *Application-Level Robustness and Redundancy in Linear Systems*, IEEE-Transactions on Circuits and Systems: Part I, Fundamental theory and applications, Vol. 49, No. 7, July 2002, pp1024-1027.

C.Alippi, *Randomised Algorithms: A System-Level, Poly-time Analysis of Robust Computation*, IEEE-Transactions on Computers, Los Alamitos (CA), USA, Vol.51, No.7, July 2002, pp.740-749.

C.Alippi, *FPE-based Criteria to Dimension Feedforward Neural Networks*, IEEE-Transactions on Circuits and Systems: Part I, Fundamental theory and applications, Vol. 46, No.8., Piscataway (NJ), USA, August 1999, pp. 962-973.

C.Alippi, *Real time analysis of ships in radar images with neural networks*, Pattern Recognition, Vol. 28, No. 12, Oxford, UK, December 1995, pp. 1899-1913.

BOOK CHAPTERS (past 5 years)

F.M.Bianchi, L. Livi, C.Alippi , *On the interpretation and characterization of echo state networks dynamics: A complex systems perspective*, Springer, 2017

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.

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C.Alippi, G.Boracchi, B.Wohlberg, Special issue on “Regularization, Complexity and Sparsity”, IEEE Computational Intelligence Magazine, December 2016

C.Alippi, R.Polikar, Special issue on “Learning in Nonstationary and Evolving Environments”, IEEE Transactions on Neural Networks and Learning Systems, January, 2014

H. Zhang, C. Alippi, D. Zhao, Neurocomputing, 2011, Special issue of the Eighth International Symposium on Neural Networks (ISNN 2011), Neurocomputing Journal, Elsevier, February 2012

C.Alippi, J.P., Thivierge , A.Minai, H.Siegelmann, M. Georgiopoulos, Special issue of IEEE-INNS International Joint Conference on Neural Networks, (IJCNN 2011), Neural Networks, 32:1-2, 2012

C.Alippi, P. Payeur, *IEEE Transactions on Instrumentation and Measurement*, vol.60, no.2, January 2011, special issue on the IEEE International Workshop on Robotic and Sensors Environments (ROSE 2009)

SPIN-OFF & START UP

Alippi activated one spin off (Sensure) and a Start up (Resen) with his collaborators and postdocs.

- **Sensure Srl**, www.sensure.it/

Target: Quality Analysis and monitoring in industrial processes with machine learning tools

- **Res.En srl**, www.resen.it

Target: Embedded system design for industrial and environmental applications

PATENTS

- C.Alippi, M.Roveri, G.Viscardi, Sistema per l'erogazione automatica di farmaci, Registered December, 2016. Italian validity
- C.Alippi, et Al., Classification method and the classifier for actuating the method. No. VE 2006 A 58. Registered September the 21st, 2006. Italian validity.
- C.Alippi, et Al., Sistema e Metodo di Monitoraggio del Tempo di Prossimità fra Entità saltuariamente interagenti. No. A000983. Registered May the 26th, 2005. EU validity.

- C.Alippi, et Al. Sistema e procedimento per il monitoraggio di saldature laser, ad esempio saldature di semilavorati costituiti da elementi in lamiera metallica di diverso spessore e-o proprietà-(tailored blanks). No. [TO2002A000376](#), Patented, January 25th, 2007,
- C.Alippi, et Al., A system and method for monitoring laser welds and giving an indication of the quality of welding, No .EP1371443B1. Patented, January 4th, 2006, EU validity.

LABORATORIES

Prof. Alippi has created two labs, one on Wireless Embedded Systems (Wemsys) one on RFID Technologies (in collaboration with HP, INTEL, Microsoft and the Management Department of PoliMi). He has also coordinated the PROMETEO Lab on Public Protection technologies (it involves 6 departments of Politecnico di Milano)

- *Wemsys Lab: Wireless Embedded Systems:*

http://www.campuspoint.polimi.it/index.php?option=com_content&view=article&id=96&Itemid=91&lang=it

- *RFID Solution Center*

<http://www.rfidsolutioncenter.it/index.php?/Persone.html>

- *PROMETEO Lab*

http://www.campuspoint.polimi.it/index.php?option=com_content&view=article&id=102&Itemid