

Autobiography

MARIA PIA FANTI

Associate Professor
Dipartimento di Elettrotecnica ed Elettronica
Polytechnic of Bari (Italy)
Via Re David 200 70125 BARI (Italy)
Tel. +39-080-5963643 Fax. +39-080- 5963410
Electronic-mail address: fanti@deemail.poliba.it
<http://www-dee.poliba.it/dee-web/Personale/fanti.html>

Research Interests

1. Discrete event systems
2. Petri net and Colored Petri nets.
3. Control and modeling of automated manufacturing systems.
4. Control and modeling of computer integrated systems: automatic guided vehicle systems, automated storage and retrieval systems, railway networks, urban traffic signals.
5. Supply chain modeling and management.
6. Health care system modeling and management
7. Structural properties of linear systems.

Details on Current Research Interests

1 Identification and fault detection of discrete event systems.

Numerous modern man made systems can be modelled as Discrete Event Systems (DES), whose dynamics is asynchronous and whose state transitions are initiated by events that occur at discrete time instants. The research investigates on basic problems in discrete event system framework: the on line identification of a model to describe discrete event systems and the specification of a diagnoser for fault detection.

System identification deals with choosing mathematical models from a known model set to characterize the input-output behaviour of an unknown system from finite. The research investigates on the identification of a Petri net modelling the DES by the real time observation of its dynamical evolution. Moreover, a critical task of large and complex systems is failure analysis. Failure analysis consists in monitoring the system behaviour and in determining the occurrence of any fault and identify its type or origin. The research addresses this problem by using on-line techniques that monitor the system dynamics and decide whether the system behaviour is normal or exhibits some possible faults

2 Modelling and control of automated manufacturing systems

The research addresses the issue of design and control of automated manufacturing systems. In particular, the research focuses on the description and control of the interactions between pieces and resources in manufacturing systems such as the scheduling of the operations and the control of the deadlock situations. In particular the deadlock problem is deeply studied in automated manufacturing systems, transportation systems and storage/retrieval systems. In some basic papers Maria Pia Fanti characterizes deadlock in a graph theoretic framework and proposes several efficient deadlock avoidance policies. Moreover, the presented deadlock avoidance strategies are applied in different application contexts by using suitable modelling tools such as Petri nets and Colored Petri nets.

3 Modelling and control of supply chains and logistics systems

Logistics systems and supply chains (SC) are set of facilities with materials that flow from the sources of raw materials to manufacturers and onwards to consumers of finished products.

The research addresses the issue of design and management the material flow and the inventory stocks in logistics and SC systems at the operational level. In particular, an efficient modular model for SC management and control at the operational level in developed in order to represent material, financial and information flow in an integrated framework. The presented model describes the SC dynamics and formalizes the system control, proposing several controllers able to optimize in a closed loop strategy some suitable performance indices. Some operative SC

parameters in short time on the basis of the knowledge of the system state and of the occasional and uncontrollable events that affect the SC behavior.

4 Modelling and control of urban and railway network systems

The research addresses the problems of the urban traffic control and the real time railway network control. In particular, some urban traffic models are proposed in order to determine the signal timing plan on the basis of technical, physical, and operational constraints and in order to simulate the traffic dynamics.

Moreover, the research deals with the railway network real time control that authorizes movements of the trains and imposes safety constraints. In particular the research focused on the deadlock prevention problem. Colored Petri nets are used to model the dynamics of the railway network system and the prevention policy is expressed by a set of linear inequality constraints enforced by adding appropriate monitor places.

Education

“Laurea” degree in Electronic Engineering University of Pisa, Pisa, Italy, 1983.

Research and Professional Experience

1983-1989	Researcher at the Department of Electrical and Electronic Engineering, Polytechnic of Bari, Italy, in projects about modeling and control of flexible manufacturing systems.
1986-1988	Researcher at Department of Electrical and Electronic Engineering, Polytechnic of Bari, Italy, in cooperation with SELENIA Society: <i>Techniques to evaluate performance indices of flexible manufacturing systems</i> .
1990-1998	Assistant Professor at the Department of Electrical and Electronic Engineering, Polytechnic of Bari, Italy.
1998-present	Associate Professor at the Department of Electrical and Electronic Engineering, Polytechnic of Bari, Italy.
1999	Visiting researcher at the Rensselaer Polytechnic Institute of Troy, New York.
1999	Seminary (2 hours) at the Electrical, Computer, and Systems Engineering Department, September 9, 1999, “Comparing Digraph and Petri Net Approaches to deadlock Avoidance in FMS”.
2008	Lecture (3 hours) at the School of Electro-Mechanical Engineering, Xidian University, Xi’an, China, June 25, 2008: “Deadlock problems solved by graph theoretic approaches”
2008	Lecture (3 hours) at the Fourth Spring School on ICT, economical and organizational issues for e-health integration in the enlarged Europe, Capo d’Istria, Slovenia, 26-29 giugno 2008 “Modelling by Petri nets: Basic concepts and applications to the hospital management”

Affiliations

Senior Member of IEEE, IEEE Robotics and Automation Society, IEEE Control Systems Society, IEEE Systems, Man and Cybernetics Society,

Honors, Awards, and Listings

1. IBM Theses Award
2. Who’s Who in Science and Engineering (Marquis Who’s Who), 4th Edition
3. Chair of the IEEE Italy Section – Systems, Man, and Cybernetics Society Chapter (date of this Chapter formation is 28 March 2005).
4. member of the IFAC Technical Committee on Discrete Event and Hybrid Systems
5. Co-chair of the *Technical committee* on Discrete Event Systems of IEEE Systems, Man, and Cybernetics Society.
6. Member of the IFAC Technical Committees TC 1.3 on Discrete Event and Hybrid Systems.

Professional Activities and Services

1. The following International Program committee member positions served

1. *IEEE Int. Conference on Systems, Man, and Cybernetics” Hyatt Orlando, Florida, USA, October 12-15, 1997.*
2. *1998 IEEE Int. Conference on Systems, Man, and Cybernetics” Hyatt Regency La Jolla, San Diego, California, USA. October 11-14, 1998.*

3. *IEEE Int. Conference on Emerging Technologies and Factory Automation, ETFA'99*, October 18-22 1999, Barcelona, Catalonia, Spain
4. *The Fifth Multi-Conference on Systemics, Cybernetics and Informatics*, July 22-25, 2002, Orlando, Florida, USA.
5. *2003 IEEE International Conference on Systems, Man and Cybernetics*, October 5-8, 2003, Washington, D.C., USA.
6. *2004 IEEE International Conference on Systems, Man and Cybernetics*, October 10-13 2004, The Hague, The Netherlands.
7. *International Workshop on Discrete Event Systems, WODES 2004*, September 22-24, Reims, France.
8. *IEEE Int. Conference on Systems, Man, and Cybernetics* Hawaii, USA, October 2005.
9. *WSEAS- DYNAMICAL SYSTEMS and CONTROL Int. Conference*, Venice, Italy, November 2-4, 2005
10. *2005 IEEE International Conference on Service Operations and Logistics, and Informatics*, Aug. 10-12, 2005, Beijing.
11. "International Congress ANIPLA 2006" University of Rome "La Sapienza" November, 13-14-15, 2006
12. *IEEE Int. Conference on Systems, Man, and Cybernetics* Taiwan, October 2006.
13. *The 9th International Conference on Information Fusion FLORENCE (ITALY)*, 10-13 JULY 2006.
14. *ICRA'07, 2007 IEEE International Conference on Robotics and Automation* 10-14 April 2007, Roma, Italy
15. *1st IFAC WORKSHOP ON DEPENDABLE CONTROL OF DISCRETE SYSTEMS, DCDS'07*, Paris-Cachan, France, June 13-15, 2007
16. *IEEE International Conference on Systems, Man, and Cybernetics*. Montréal, Canada, October 7-10, 2007.
17. *IEEE Int. Conference in Automation Science and Engineering, CASE 2007*, Sept 22 – 25, 2007, Scottsdale, Arizona, USA
18. *WODES'08 International Workshop on Discrete Event Systems*, May 28-30, 2008 Goteborg, Sweden.
19. *Workshop on Petri Nets and Agile Manufacturing* June 24-25, 2008 - Xi'an, China, a satellite event of the Petri Nets 2008, 29th International Conference on Application and Theory of Petri Nets and Other Models of Concurrency Xi'an, China, June 23-27, 2008.
20. *IEEE Int. Conference in Automation Science and Engineering, CASE 2008*, Aug. 28 – 31, 2008, Whashington, D.C., USA.
21. *IEEE International Conference on Systems, Man, and Cybernetics*. 2008, 12 - 15 October 2008, Singapore.

2. Sessions Chaired/Organized

1. Deadlock detection, Prevention and Avoidance in Flexible Production Systems, *IEEE Int. Conference on Systems, Man, and Cybernetics" Hyatt Orlando, Florida, USA, October 12-15, 1997*.
2. Recent Advance in Deadlock Avoidance of Large-Scale, Flexibly Automated Manufacturing Systems", *1998 IEEE Int. Conference on Systems, Man, and Cybernetics" Hyatt Regency La Jolla, San Diego, California, USA. October 11-14, 1998*.
3. Discrete-Event/Hybrid Systems and Control, *1998 IEEE Int. Conference on Systems, Man, and Cybernetics" Hyatt Regency La Jolla, San Diego, California, USA. October 11-14, 1998*.
4. Discrete-Event/Hybrid Systems and Control, *IEEE Int. Conference on Emerging Technologies and Factory Automation, ETFA'99*, October 18-22 1999, Barcelona, Catalonia, Spain.
5. Modelling, optimization and design of supply chains, *2003 IEEE International Conference on Systems, Man and Cybernetics*, October 5-8, 2003, Washington, D.C., USA.
6. "Petri Nets and Discrete Event systems" (Track of 5 sessions), *2003 IEEE International Conference on Systems, Man and Cybernetics*, October 5-8, 2003, Washington, D.C., USA.
7. "Modelling and control of transportation and traffic systems" (track of 3 sessions) *2003 IEEE International Conference on Systems, Man and Cybernetics*, October 5-8, 2003, Washington, D.C., USA..
8. "Petri Nets: theory and applications" (Track of 3 sessions), *2004 IEEE International Conference on Systems, Man and Cybernetics*, October 10-13 2004, The Hague, The Netherlands.
9. "Petri Nets: theory and applications" (Track of 2 sessions), *2004 IEEE International Conference on Systems, Man and Cybernetics*, October 10-13 2004, The Hague, The Netherlands.
10. "Colored Petri nets: theory and applications", *International Workshop on Discrete Event Systems, WODES 2004*, September 22-24, Reims, France
11. Discrete Event Systems and Petri Nets: Theory and Applications. *2005 WSEAS International Conference on DYNAMICAL SYSTEMS and CONTROL*, Venice (Venezia), Italy, November 2-4, 2005.
12. Discrete Event System and Petri nets. (track di 3 ssioni) *IEEE International Conference on Systems, Man and Cybernetics*, Taipei, Taiwan, October 2006.

13. Discrete Event System and Petri nets. IEEE International Conference on Systems, Man, and Cybernetics. Montréal, Canada, October 7-10, 2007
14. Track on Planning and Scheduling *CASE 2007*, Sept 22 – 25, 2007, Scottsdale, Arizona, USA
15. *Diagnosis and Identification of Petri Nets*, 9th International Workshop on Discrete Event Systems, Goteborg, Sweden, May 28-30, 2008.
16. Track on *Planning and Scheduling* IEEE Int. Conference in Automation Science and Engineering, CASE 2008, Aug. 28 – 31, 2008, Whashington, D.C., USA.
17. *Design and Control of Discrete Event and Hybrid Systems*. IEEE International Conference on Systems, Man, and Cybernetics, 12 - 15 October 2008, Singapore.
18. *Advance in Information and e-Integration in Healthcare Systems and Management*, European Modeling & Simulation Symposium 2008, and International Workshop on Modelling & Applied Simulation, Calabria, 17-19 September, 2008.
19. Track on *Advance in Information and e-Integration in Healthcare Systems and Management*, International Workshop on Modelling & Applied Simulation, 17-19 September, Calabria, Italy, 2008.

Serving as an editor:

1. *Associate editor* of the Int. J. “**IEEE Transactions on Systems, Man and Cybernetics: Part A. Systems and Humans**”.
2. *Associate editor* of the int. J. “**IEEE Transactions on Automation Science and Engineering**”.
3. *Guest editor* of the "Special Issue on Deadlock Resolution in Computer Integrated Systems" IEEE Transactions on Systems, Man and Cybernetics: Part A. Systems and Humans, vol. 14, no. 1, pp. 80-92, January 2004.
4. *Associate editor* of the Int. J. “**Enterprise Information Systems**” Taylor & Francis Group.
5. *Associate editor* of the Int. J. “**The Mediterranean Journal of Measurement and Control**”;
6. Member of the editorial board of “**International Journal of Automation and Control**” (IJAAC) ISSN (Print): 1740-7516.
7. *Editor* with M. Zhou of the book “*Deadlock Resolution in Computer-Integrated Systems*”, Marcel Dekker Inc., New York, NY 2004.

Serving as a Referee for

Journals

IEEE Transactions on Robotics and Automation,
 IEEE Transactions on Systems, Man, and Cybernetics. Part A, B and C.
 IEEE Transactions on Automatic Control,
 IEEE Transactions on Automation Science and Engineering,
 IIE Transactions,
 Int. Journal of Flexible Manufacturing Systems,
 Int. Journal of Production Research

Publications

120+ papers; 2 books, 8 book chapters, 42 journal papers, 74 conference papers (conference papers are not listed)

Books

- 1 M.P. Fanti, M.C. Zhou, **Deadlock Resolution in Computer-Integrated Systems**, ISBN: 0824753682, Dekker/CRC Press, New York, USA, 2005, 696 pages.
- 2 M. Dotoli, M.P. Fanti, **Matlab: Guida al Laboratorio di Automatica**, (in Italian) De Agostini Scuola, CittàStudiEdizioni, 2008, ISBN 9788825173253, 448 pages.

Book Chapters

1. B.Maione, M.P.Fanti, B.Turchiano "Large Scale Markov Chain Modelling of Transfer Lines", in *Operations Research models in Flexible Manufacturing Systems*, CISM, Udine, Italy, October 5-9 1987, Springer-Verlag, 193-211.
2. M.P. Fanti, B. Maione, G. Piscitelli, B. Turchiano "Techniques and Applications of the System Approach to the Design of Generic Software for Real-Time Control of Flexible Manufacturing Systems (FMS)", in *Computer*

Aided Design, Engineering, and Manufacturing: Systems, Techniques and Applications, Volume II, Computer Integrated Manufacturing, Editore C. Leondes, Gordon and Breach International Series in Engineering, Technology and Applied Science, Section 1, pp. 1-31, CRC press, 2001.

3. M.P. Fanti, "Deadlock-Free Control in Automated Guided Vehicle Systems", *Concurrency in Dependable Computing*, P. Ezhilchelvan and A. Romanovsky Eds., Kluwer Academic Publishers. Printed in the Netherlands, 2002.
4. M.P. Fanti, M.C. Zhou, "Introduction to Deadlock Research in Computer-integrated Systems", M.P. Fanti, M.C. Zhou Eds., *Deadlock Resolution in Computer-Integrated Systems*, Dekker/CRC Press, New York, USA, 2005, pp. 1-34.
5. M. P. Fanti, B. Maione, G. Maione, and B. Turchiano, "Digraph-based Techniques for Deadlock Resolution in Automated Manufacturing Systems", Maria Pia Fanti and MengChu Zhou Eds. *Deadlock Resolution in Computer-Integrated Systems*, Dekker/CRC Press, New York, USA, 2005, pp. 131-154.
6. M. Dotoli, M.P. Fanti, C. Meloni, M.C. Zhou, "Service Computing for Design and re-Configuration of Integrated e-Supply Chains", *Enterprise Service Computing: From Concept to Deployment*, Idea Group, Inc., edited by Robin G. Qiu, Idea Group Publishing, Hershey, PA, USA, 2006, pp. 322-354, ISBN 1-59904-180-4.
7. M. Dotoli, M. P. Fanti, G. Iacobellis, A Coloured Timed Petri Net Model for Supply Chain Management and Performance Evaluation, to appear in "Modeling and Control of Discrete", *Production Systems*", ISA/O3NEDIA.
8. M. Dotoli, M. P. Fanti, A. Giua, C. Seatzu, Modelling Systems by Hybrid Petri Nets: an Application to Supply Chains, to appear in "Petri Net, Theory and Application", ARS Publishing, ISBN 978-3-902613-12-7.

Journal Articles

1. M.P. Fanti, B.Maione, B.Turchiano: "Structurally Fixed Modes of Systems Described by Rosenbrock's Polynomial Matrices", *Int. J. Control*, vol.48, no. 5, pp.1947-1965, 1988.
2. M.P. Fanti, B.Maione, Q.Semeraro, B.Turchiano: "Assessing the Operational Analysis Robustness for Flexible Manufacturing Systems Modelling", *Int. J. of Systems Science*, vol. 19, no. 11, pp. 2381-2394, 1988.
3. M.P. Fanti, B. Maione, B. Turchiano "A strategy for partitioning and ordering of the states of Markov chains for three state production lines analysis", *Automazione e Strumentazione*, n.6, pp.185-190, 1989.
4. M.P. Fanti, B. Maione, R. Peluso, B. Turchiano, "Two-level Solution Method for Markov Chain Modelling Transfer Lines with Unreliable Servers and Finite Buffers", *Int. J. of Systems Science*, vol. 20, no. 6, pp. 971-986, 1989.
5. M.P. Fanti, B. Maione, B. Turchiano "Controllability of Linear Single-Input Positive Discrete-Time Systems", *Int. J. Control*, vol. 50, no. 6, pp. 2523-2542, 1989.
6. M.P. Fanti, B. Maione, B. Turchiano "Controllability of Multi-Input Positive Discrete-Time Systems", *Int. J. Control*, vol. 51, no. 6, pp.1295-1308, 1990.
7. M.P. Fanti, B. Maione, G. Piscitelli, B. Turchiano "Alcuni Criteri di Gestione delle Code in un FMS", *Automazione e Strumentazione*, vol. XXXIX, no. 9, pp.109-117, 1991.
8. L. Carnimeo, M.P. Fanti, M. Trovato, B. Turchiano "A Graph-Theoretic Decoupling Technique for the Design of Synchronous Generator Controllers", *IEE Proceeding-D Control Theory and Applications*, vol. 139, no. 3, pp. 337-345, 1992.
9. M.P. Fanti, B. Maione, G. Piscitelli, B. Turchiano "System approach to a generic software specification for Flexible Manufacturing System job flow management", *Int. J. of Systems Science*, vol. 23, no. 11, pp. 1889-1902, 1992.
10. M.P. Fanti, G. Maione, B. Turchiano, "New Policies for Deadlock Avoidance in Flexible Manufacturing Cells", *Automazione e Strumentazione*, vol. XLIV, no. 2, pp. 91-95, 1996.
11. M.P. Fanti, B. Maione, G. Piscitelli, B. Turchiano "System Approach to Design Generic Software for Real-Time Control of Flexible Manufacturing Systems" *IEEE Trans. on Systems, Man, and Cybernetics, Part A: Systems and Humans*, vol. 26, no. 2, pp. 190-202, 1996.
12. M.P. Fanti, B. Maione, B. Turchiano "Decoupling of MIMO systems by graph-theoretic approach," *Studies in Informatics and Control*, vol. 5, no. 1, pp 49-68, 1996.
13. M.P. Fanti, B. Maione, S. Mascolo, B. Turchiano, "Performance of Deadlock Avoidance Algorithms in Flexible Manufacturing Systems," *Journal of Manufacturing Systems*, vol. 15, no.3, 164-178, 1996.
14. M.P. Fanti, B. Maione, G. Piscitelli, B. Turchiano "Heuristic scheduling of jobs on a multi-product batch processing machine", *Int. Journal of Production Research*, vol. 34, no. 8, pp. 2163-2186, 1996.
15. M.P. Fanti, G. Maione, B. Turchiano, "Digraph-Theoretic Approach for Deadlock Detection and Recovery in Flexible Production Systems," *Studies in Informatics and Control*, vol. 5, no. 4, pp 373-383, 1996.

- 16 M.P. Fanti, F. Ferrarini, "Deadlock Avoidance Techniques for flexible manufacturing Systems" *Automazione e Strumentazione*, vol. XLV, no. 2, pp. 121-127, 1997.
- 17 M.P. Fanti, B. Maione, S. Mascolo, B. Turchiano "Event-Based Feedback Control for Deadlock Avoidance in Flexible Production Systems," *IEEE Trans. on Robotics and Automation*, vol. 13, no. 3, pp. 347-363, June 1997
- 18 M.P. Fanti, B. Maione, S. Mascolo, B. Turchiano "Low-cost deadlock avoidance policies for Flexible Production Systems", *Int. Journal of Modelling and Simulation*, vol. 17, n. 4, pp. 310-316, 1997.
- 19 M.P. Fanti, B. Maione, B. Turchiano, "Event Control for Deadlock Avoidance in Production Systems with Multiple Capacity Resources," *Studies in Informatics and Control*, vol. 7, no. 4, pp 373-383, 1998.
- 20 M.P. Fanti, B. Maione, D. Naso, B. Turchiano, "Multi-criteria Approach to Flexible Line Scheduling", *Int. J. of Approximate Reasoning*, Vol. 19, n. 1, pp. 5-21, 1998.
- 21 M.P. Fanti, B. Maione, B. Turchiano, "Comparing Digraph and Petri Net Approaches to Deadlock Avoidance in FMS", *IEEE Trans. on Systems, Man and Cybernetics. Part B: Cybernetics*, vol. 30, no. 5, pp. 783-798, October 2000.
- 23 M.P. Fanti, G. Maione, B. Turchiano, "Distributed Event-Control for Deadlock Avoidance in Automated Manufacturing Systems", *Int. Journal of Production Research*, vol 39, no.9, 1993-2021, 2001.
- 24 M.P. Fanti, G. Maione, B. Turchiano, "Design of Supervisors Avoiding Deadlock in Flexible Assembly Systems", *Int. Journal of Flexible Manufacturing Systems*, vol. 14, pp. 157-175, 2002.
- 25 M.P. Fanti, "Event-based controller to avoid deadlock and collisions in zone control AGVS", *Int. Journal of Production Research*, vol. 40, no. 6, 1453-1478, 2002.
- 25 M. Dotoli, M.P. Fanti, "Coloured timed Petri net model for real-time control of automated guided vehicle systems" *Int. Journal of Production Research*, vol. 42, no. 9, pp. 1787-1814, 2004, UK.
- 26 M.P. Fanti, "Deadlock Resolution Strategy for Automated Manufacturing Systems Including Conjunctive Resource Service" *IEEE Trans. on Systems, Man and Cybernetics. Part A: Systems and Humans*, vol. 34, no. 1, pp. 80-92, January 2004 USA.
- 27 M.P. Fanti, M. Zhou, "Deadlock Control Methods in Automated Manufacturing Systems", *IEEE Trans. on Systems, Man and Cybernetics. Part A: Systems and Humans*, vol. 34, no. 1, pp.5-22, January 2004, USA.
- 28 M. Dotoli, M.P. Fanti, "A Colored Petri Net Model for Automated Storage and Retrieval Systems Serviced by Rail-Guided Vehicles: a Control Perspective", *International Journal on Computer Integrated Manufacturing*, vol. 18, no. 2-3, pp. 122-136, March-May 2005.
- 29 M. Dotoli, M.P. Fanti, C. Meloni, M. Zhou, "A multi-level approach for network design of Integrated Supply Chain", *Int. Journal of Production Research*, vol. 43, no. 20, pp. 4267-4287, October 2005.
- 30 A. Desrochers, T. J. Deal, M.P. Fanti, "Complex-Valued Token Petri nets", *IEEE Transactions on Automation Science and Engineering*, vol. 2, no. 4 October 2005, New York, USA.
- 31 M. Dotoli, M.P. Fanti, "An Urban Traffic Network Model via Coloured Timed Petri Nets", *Control Engineering Practice*. Vol. 14, No.10, October 2006, pp. 1213-1229.
- 32 M. Dotoli, M.P. Fanti, C. Meloni, "A signal timing plan formulation for urban network control", *Control Engineering Practice*, [vol. 14, no. 11](#), November 2006, pp. 1297-1311.
- 33 M. Dotoli, M.P. Fanti, C. Meloni, M. Zhou, "Design and Optimization of Integrated E-Supply Chain for Agile and Environmentally Conscious Manufacturing", *IEEE Trans. on Systems, man, and Cybernetics. Part A: Systems and Humans*, vol. 36, no. 1, January 2006, pp.62-75.
- 34 M.P. Fanti, A. Giua, C. Seatzu, "Monitor design for Colored Petri Nets: an application to deadlock prevention in railway networks", *Control Engineering Practice* Vol. 14, No.10, October 2006, pp. 1231-1247.
- 35 M. Dotoli, M.P. Fanti, A.M. Mangini, "Fuzzy Multi-Objective Optimization for Network Design of Integrated e-Supply Chains", *International Journal on Computer Integrated Manufacturing*, vol. 20, no. 6, September 2007, pp. 588-601.
- 36 M. Dotoli, M.P. Fanti, "A Generalized Stochastic Petri Net Model for Supply Chain Management", *The Mediterranean Journal of Measurement and Control*, vol. 2, no. 1, January 2006, pp. 1-11, ISSN: 1743-9310
- 37 N. Costantino, M. Dotoli, M. Falagario, M.P. Fanti, G. Iacobellis, Evaluating the Total Costs of Purchasing via Probabilistic and Fuzzy Reasoning, *Fuzzy Economic Review*, vol. 11, no.1, May 2006, pp. 69-92.
- 38 M. Dotoli, M.P. Fanti, Deadlock Detection and Avoidance Strategies for Automated Storage and Retrieval Systems, *IEEE Transactions on Systems Man and Cybernetics, part C: Applications and reviews*, vol. 37, no. 4, July 2007.
- 39 M. Dotoli, M.P. Fanti, A.M. Mangini, "Real Time Identification of Discrete Event Systems Using Petri Nets", *Automatica*, May, 2008, vol. 44, no. 5, ISSN: 0005-1098.
- 40 M. Dotoli, M.P. Fanti, A. Giua, C. Seatzu, "First-order hybrid Petri nets. An application to distributed manufacturing systems", *Nonlinear Analysis: Hybrid Systems*, vol. 2, no. 2, 2008, pp. 408-430.

- 41 M. Dotoli, M.P. Fanti, A.M. Mangini, "A fault monitor for automated manufacturing systems using a hybrid Petri nets formalism", accepted on *Transactions of the Institute of Measurement and Control*, 2008.
- 42 M. Dotoli, M.P. Fanti, G. Iacobellis, A.M. Mangini, "A First Order Hybrid Petri Net Model for Supply Chain Management", accepted on *IEEE Transactions on Automation Science and Engineering*, 2008.

Developed Courses

Computer Engineering:

Modeling and Control of automated production systems. 2005 at present.
Process Control I, 2007 at present

Electrical Engineering:

Automatic Control 1994-2004.
Automatic Control II 2004 at present.

Mechanical Engineering:

Automatic Control 1994-2004
Industrial Automation 2003 at present.

Management Engineering

Industrial Automation 2003 at present

Electronic Engineering

Fundamental on Automatic Control I 2004-2005
Fundamental on Automatic Control II 2004-2005