

# Paolo Rocco

## Curriculum vitae



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### Short CV

Paolo Rocco was born in Busto Arsizio (Italy) in 1966. He received the 'Laurea' degree cum laude in Electronics Engineering and the Doctorate degree in Computer Science and Automation in 1991 and 1995, respectively, both from Politecnico di Milano, Italy.

After a research stay at Georgia Tech, Atlanta, USA, since 1996 he has been with the Department of Electronics, Information and Bioengineering (DEIB) of Politecnico di Milano, where he is currently Full Professor in Systems and Control. He teaches Automatic Control and Robotics courses. From 2013 to 2018 he served as Chair of the BSc and MSc Programs in Automation and Control Engineering at Politecnico di Milano. At present he sits in the Board of Governors of Politecnico di Milano, for the triennium 2022-24. Since 2023 he has been serving as Head of the Systems and Control research area at DEIB.

Dr. Rocco served in the executive board of SIDRA, the national society of Italian Professors in Automatic Control, and of ANIPLA, the Italian National Association for the Automation. He also served in the Board of Directors of MADE, the Industry 4.0 Competence Center based in Milano, where he is currently scientific responsible for the projects. At present, he sits in the Board of Directors of euRobotics, the association of all stakeholders in robotics in Europe, and of I-RIM, the association of robotics and intelligent machines in Italy. He is also a member of the Advisory Board of the CLC-South of EIT-Manufacturing.

Paolo Rocco served as a Founding Senior Editor for the IEEE Robotics and Automation Letters and is currently serving as a Senior Editor of the IEEE Transactions on Automation Science and Engineering, as well as an Associate Editor for the IFAC journal Mechatronics and for the International Journal of Robotics Research. His research interests include industrial robotics, with particular reference to collaborative robotics. He is the author of about 200 papers in international journals, book chapters and both international and national conferences.

Paolo Rocco is in charge of the MERLIN mechatronics and industrial robotics laboratory. He is currently, and has been in the past, the holder of research contracts with private companies and of some research projects financed by public bodies. The technology transfer activity led to the filing of some patent applications and the creation of the startup Smart Robots, a spinoff of the Politecnico di Milano, of which he is co-founder.

He serves as an expert for the European Commission and for the Italian Ministry of University and Research for the evaluation of proposals and ongoing projects.

## Extended CV

### Bio

Paolo Rocco was born in Busto Arsizio (Italy) in 1966.

He is married and has two children.

### Education

- 1985: High school scientific degree (60/60) from Liceo Scientifico Statale "A. Tosi", Busto Arsizio, Italy.
- 1991: 'Laurea' degree (equivalent to a MSc degree) (100/100 *cum laude*) in Electronic Engineering from Politecnico di Milano, Italy.
- 1995: Doctorate degree in Computer Science and Automation from Politecnico di Milano, Italy.

### Professional experience

- 1991: Internship (8 months) in Tecnospaio, a company active in space robotics
- 1995: Visiting Scholar at the School of Mechanical Engineering of Georgia Tech, Atlanta, USA
- 1996-1998: Researcher (Assistant Professor) in Systems and Control at Politecnico di Milano, Italy
- 1998-2007: Associate Professor in Systems and Control at Politecnico di Milano, Italy
- 2007-present: Full Professor in Systems and Control at Politecnico di Milano, Italy

### Academic roles

- 1999-2002: Member of the administrative board of the Department of Electronics and Information at Politecnico di Milano
- 2000-2010: Member of the Board of Professors of the Doctorate Program in Information Technology at Politecnico di Milano
- 2005-2006: Co-chair of a Master in Design of Mechatronic Systems at Politecnico di Milano
- 2007-2010: Vice-chair of the Board of Professors of the Doctorate Program in Information Technology at Politecnico di Milano
- 2007-2012: Secretary (vice-chair) of the BSc and MSc Programs in Automation and Control Engineering at Politecnico di Milano
- 2013-2018: Chair of the BSc and MSc Programs in Automation and Control Engineering at Politecnico di Milano (approximately 1300 students in the five years of the Programs)
- 2022-present: Member of the Board of Governors of Politecnico di Milano

- 2023-present: Head of Systems and Control research area at the Department of Electronics, Information and Bioengineering of Politecnico di Milano (approximately 50 faculties and 120 PhD students and research assignees)

### **Editorial duties**

- 2001-2010: Member of the International Program Committee for the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)
- 2004: Co-editor of a special issue on Mechatronics of the IFAC journal "Annual reviews in control"
- 2004-2008: Associate Editor for the IEEE Transactions on Robotics
- 2007-2013: Member of the Conference Editorial Board of the Robotics and Automation Society of the IEEE, serving as Associate Editor for ICRA (IEEE International Conference on Robotics and Automation), the flagship conference of the society
- 2007-2013: Chair of the ANIPLA National Congress on Motion Control (editions 2007, 2010, and 2013) and organizer of several workshop in the same area
- 2009-2011: Associate Editor for IROS (IEEE/RSJ International Conference on Intelligent Robots and Systems)
- 2010-present: Member of the EURON (later EuRobotics) Education and Training Board, in charge of the evaluation of candidates for the PhD Thesis award in Robotics at European level
- 2015-2020: Senior Editor for the journal IEEE Robotics and Automation Letters
- 2016-present: Associate Editor of the IFAC journal Mechatronics
- 2022-present: Senior Editor of the journal IEEE Transactions on Automation Science and Engineering
- 2023-present: Associate Editor of the International Journal of Robotics Research

### **Organizational duties**

- 2003-2017: Member of the executive board of ANIPLA, the Italian National Association for the Automation
- 2011-2016: Member of the executive board of SIDRA, the National Society of Italian Professors in Automatic Control
- 2017-2020 and 2021-present: Member of the Board of Directors of euRobotics, the association of all stakeholders in robotics in Europe
- 2019-present: Member of the Board of Directors of I-RIM, the Italian Institute of Robotics and Intelligent Machines
- 2019-2021: Member of the Board of Directors of MADE, the Industry 4.0 National Competence Center in Milano
- 2019-present: Scientific Responsible for the area of projects in MADE, the Industry 4.0 National Competence Center in Milano
- 2020-present: Member of the Advisory Board of the CLC-South of EIT Manufacturing
- 2020: nominated by the Ministry of University and Research in the panel of five experts for the preparation of the National Research Program in the area of robotics

## Projects

- 2002-2009: in charge of several research projects with industrial partners and public bodies (the Lombardy Region, the Italian Ministry for Research and University, the European Commission), for an overall grant of approximately 500 k€
- 2009-2013: person in charge for Politecnico di Milano in the FP7 four years long European Integrating Project ROSETTA (ICT - 230902) on robotics (grant approximately 1 M€)
- 2015: in charge for Politecnico di Milano of a national project on robotics and of an industrial project with a major robotics company, for an overall grant of approximately 260 k€
- 2016-2018: in charge for Politecnico di Milano of several industrial projects with companies, for an overall grant of approximately 750 k€
- 2018-2021: in charge for Politecnico di Milano of a regional project on the cyber physical production systems (grant approximately 170 k€)
- 2019-2021: in charge for Politecnico di Milano of industrial projects with companies, for an overall grant of approximately 500 k€

## Technology transfer

- Paolo Rocco is co-inventor of the following international patents, filed as extensions of already granted national patents:
  - "Method and device for controlling the motion of one or more collaborative robots" PCT/IB2017/052932
  - "A predictive control method of a robot and related control system" PCT/IB2019/054763

and of the following national patent:

- "Metodo per generare un segnale di consapevolezza di un robot collaborativo e relativo sistema hardware", Italian patent 102018000007934
- Paolo Rocco is co-founder of Smart Robots, a spin-off company of Politecnico di Milano

## Scientific qualification

Dr. Rocco's research interests include industrial robotics, physical human-robot interaction, redundant manipulators, use of computer vision in robotics, control of servomechanisms, and mechatronics in general. He is the author of about 200 papers in international journals, book chapters and both international and national conferences. He serves as an expert for the European Commission and for the Italian Ministry of University and Research for the evaluation of proposals and ongoing projects.

## Awards

- KUKA Innovation Award 2014 (finalist)
- Co-author of "Achieving humanlike motion: resolving redundancy for anthropomorphic industrial manipulators" (by A.M. Zanchettin, L. Bascetta, P. Rocco), winner of the 2014 Young Author Best Paper Award of the Italian Chapter of the IEEE Robotics and Automation Society, 2014

- Co-author of "Pre-collision control strategy for human-robot Interaction based on dissipated energy in potential inelastic impacts" (by R. Rossi, M. Parigi Polverini, A.M. Zanchettin, P. Rocco), finalist of IROS 2015 Best Student Paper Award, 2015
- Co-author of "Data-driven design of implicit force control for industrial robots" (by M. Parigi Polverini, S. Formentin, L. Ahn Dao, P. Rocco), finalist of ICRA 2017 Best Student Paper Award, 2017
- euRobotics Technology Transfer Award 2018 (ranked third) with Smart Robots
- Innovation Award MEC SPE 2019 (finalist) with Smart Robots, ABB, and Vodafone
- CES 2020 Innovation Awards Honoree with Smart Robots

## Publications

### *Papers in International Journals*

[IJ72] B. LACEVIC, A. M. ZANCHETTIN, P. ROCCO

Safe human-robot collaboration via collision checking and explicit representation of danger zones

**IEEE Transactions on Automation Science and Engineering**, Volume 20, Issue 2, pp. 846-861, April 2023

[IJ71] N. LUCCI, A. MONGUZZI, A. M. ZANCHETTIN, P. ROCCO

Workflow modelling for human-robot collaborative assembly operations

**Robotics and Computer-Integrated Manufacturing**, Volume 78, December 2022  
Article number 102384

[IJ70] A. M. ZANCHETTIN, C. MESSERI, D. CRISTIANTELLI, P. ROCCO

Trajectory optimisation in collaborative robotics based on simulations and genetic algorithms

**International Journal of Intelligent Robotics and Applications**, Volume 6, Issue 4, Pages 707-723, December 2022

[IJ69] C. MESSERI, A. BICCHI, A. M. ZANCHETTIN, P. ROCCO

A dynamic task allocation strategy to mitigate the human physical fatigue in collaborative robotics

**IEEE Robotics and Automation Letters**, Vol. 7, pp. 2178-2185, April 2022  
(also presented at ICRA 2022)

[IJ68] D. BAZZI, G. PRIORA, A. M. ZANCHETTIN, P. ROCCO

RRT\* and goal-driven variable admittance control for obstacle avoidance in manual guidance applications

**IEEE Robotics and Automation Letters**, Vol. 7, pp. 1920-1927, April 2022  
(also presented at ICRA 2022)

[IJ67] R. MADERNA, M. POZZI, A. M. ZANCHETTIN, P. ROCCO, D. PRATTICCHIZZO

Flexible scheduling and tactile communication for human-robot collaboration

**Robotics and Computer Integrated Manufacturing**, Vol. 73, Article 102233, February 2022

[IJ66] A. SCIUTTI, F. BATTAGLIA, M. R. FOSSATI, V. CALDERAI, M. G. CATALANO, G. ANTONELLI, G. M. DI NUNZIO, N. DUBBINI, L. GIARRE, E. MENEGATTI, F. NEGRELLO, F. PASCUCCI, M. PIVETTI, A. M. ZANCHETTIN, A. BARONCELLI, S. MAJORANA, C. MARCHISIO, B. SICILIANO,

- P. ROCCO, G. METTA, C. MELCHIORRI, C. LASCHI, E. GUGLIEMELLI, A. DE LUCA, P. DARIO, A. BICCHI  
Making an opportunity out of a crisis: the inclusive approach of the Italian robotics community  
**IEEE Robotics and Automation Magazine**, Vol. 28, pp. 79-91, December 2021
- [IJ65] R. JIN, P. ROCCO, X. CHEN, Y. GENG  
LPV-based offline model predictive control for free-floating space robots  
**IEEE Transactions on Aerospace and Electronic Systems**, Vol. 57, pp. 3896-3904, December 2021
- [IJ64] C. MESSERI, G. MASOTTI, A. M. ZANCHETTIN, P. ROCCO  
Human-robot collaboration: optimizing stress and productivity based on game theory  
**IEEE Robotics and Automation Letters**, Vol. 6, pp. 8061-8068, October 2021  
(also presented at IROS 2021)
- [IJ63] D. BAZZI, F. ROVEDA, A. M. ZANCHETTIN, P. ROCCO  
A unified approach for virtual fixtures and goal-driven variable admittance control in manual guidance applications  
**IEEE Robotics and Automation Letters**, Vol. 6, pp. 6378-6385, October 2021  
(also presented at IROS 2021)
- [IJ62] R. JIN, P. ROCCO, Y. GENG  
Observer-based fixed-time tracking control for space robots in task space  
**Acta astronautica**, Volume 184, July 2021, pp. 35-45
- [IJ61] R. JIN, P. ROCCO, Y. GENG  
Cartesian trajectory planning of space robots using a multi-objective optimization  
**Aerospace Science and Technology**, Volume 108, January 2021, Article number 106360
- [IJ60] A. CASALINO, A. M. ZANCHETTIN, L. PIRODDI, P. ROCCO  
Optimal scheduling of human-robot collaborative assembly operations with time Petri nets  
**IEEE Transactions on Automation Science and Engineering**, Vol. 18, pp. 70-84, January 2021
- [IJ59] N. LUCCI, B. LACEVIC, A. M. ZANCHETTIN, P. ROCCO  
Combining speed and separation monitoring with power and force limiting for safe collaborative robotics applications  
**IEEE Robotics and Automation Letters**, Vol. 5, pp. 6121-6128, October 2020  
(also presented at IROS 2020)
- [IJ58] C. MESSERI, A. M. ZANCHETTIN, P. ROCCO, E. GIANOTTI, A. CHIRICO, S. MAGONI, A. GAGGIOLI  
On the effects of leader-follower roles in dyadic human-robot synchronisation  
**IEEE Transactions on Cognitive and Developmental Systems**, available on line, DOI: 10.1109/TCDS.2020.2991864
- [IJ57] D. NICOLIS, F. ALLEVI, P. ROCCO  
Operational space model predictive sliding mode control for redundant manipulators  
**IEEE Transactions on Robotics**, Vol. 36, pp. 1348-1355, August 2020
- [IJ56] M. PARIGI POLVERINI, S. FORMENTIN, L. MERZAGORA, P. ROCCO  
Mixed data-driven and model-based robot implicit force control: a hierarchical approach  
**IEEE Transactions on Control Systems Technology**, Vol. 28, pp. 1258-1271, July 2020
- [IJ55] F. FERRAGUTI, R. VILLA, C. TALIGNANI LANDI, A. M. ZANCHETTIN, P. ROCCO, C. SECCHI

A unified architecture for physical and ergonomic human-robot collaboration  
**Robotica**, Vol. 38, pp. 669-683, April 2020

[IJ54] M. PARIGI POLVERINI, A. M. ZANCHETTIN, P. ROCCO  
A constraint-based programming approach for robotic assembly skills implementation  
**Robotics and Computer Integrated Manufacturing**, Vol. 59, pp. 69-81, October 2019.

[IJ53] A. M. ZANCHETTIN, P. ROCCO, R. ROSSI, S. CHIAPPA  
Towards an optimal avoidance strategy for collaborative robots  
**Robotics and Computer Integrated Manufacturing**, Vol. 59, pp. 47-55, October 2019.

[IJ52] A. M. ZANCHETTIN, A. CASALINO, L. PIRODDI, P. ROCCO  
Prediction of human activity patterns for human-robot collaborative assembly tasks  
**IEEE Transactions on Industrial Informatics**, Vol. 15, No. 7, pp. 3934-3942, July 2019

[IJ51] A. CASALINO, C. MESSERI, M. POZZI, A. M. ZANCHETTIN, P. ROCCO, D. PRATTICCHIZZO  
Operator awareness in human-robot collaboration through wearable vibrotactile feedback  
**IEEE Robotics and Automation Letters**, Vol. 3, No. 4, pp. 4289-4296, October 2018  
(also presented at IROS 2018)

[IJ50] M. RAGAGLIA, A.M. ZANCHETTIN, P. ROCCO  
Trajectory generation algorithm for safe human-robot collaboration based on multiple depth sensor measurements  
**Mechatronics**, Vol. 55, pp. 267-281, November 2018

[IJ49] D. NICOLIS, M. PALUMBO, A. M. ZANCHETTIN, P. ROCCO  
Occlusion-free visual servoing for the shared autonomy teleoperation of dual-arm robots  
**IEEE Robotics and Automation Letters**, Vol. 3, No. 2, pp. 796-803, April 2018  
(also presented at ICRA 2018)

[IJ48] M. BUIZZA AVANZINI, A.M. ZANCHETTIN, P. ROCCO  
Constrained model predictive control for mobile robotic manipulators  
**Robotica**, Vol. 36, No.1, pp. 19-38, January 2018

[IJ47] M. PARIGI POLVERINI, A.M. ZANCHETTIN, P. ROCCO  
A computationally efficient safety assessment for collaborative robotics applications  
**Robotics and Computer Integrated Manufacturing**, Vol. 46, pp. 25-37, August 2017

[IJ46] M. PARIGI POLVERINI, D. NICOLIS, A.M. ZANCHETTIN, P. ROCCO  
Implicit robot force control based on set invariance  
**IEEE Robotics and Automation Letters**, Vol. 2, No.3, pp. 1288-1295, July 2017  
(also presented at ICRA 2017)

[IJ45] R. ROSSI, A. SANTAMARIA-NAVARRO, J. ANDRADE-CETTO, P. ROCCO  
Trajectory generation for unmanned aerial manipulators through quadratic programming  
**IEEE Robotics and Automation Letters**, Vol. 2, No.2, pp. 389-396, April 2017  
(also presented at ICRA 2017)

[IJ44] A.M. ZANCHETTIN, P. ROCCO  
Motion planning for robotic manipulators using robust constrained control  
**Control Engineering Practice**, Vol. 59, pp. 127-136, February 2017

[IJ43] M. RAGAGLIA, A.M. ZANCHETTIN, L. BASCETTA, P. ROCCO  
Accurate sensorless lead-through programming for lightweight robots in structured environments  
**Robotics and Computer Integrated Manufacturing**, Vol. 39, pp. 9-21, June 2016

- [IJ42] A.M. ZANCHETTIN, N.M. CERIANI, P. ROCCO, H. DING, B. MATTHIAS  
Safety in human-robot collaborative manufacturing environments: metrics and control  
**IEEE Transactions on Automation Science and Engineering**, Vol. 13, No. 2, pp. 882-893, April 2016
- [IJ41] D. NICOLIS, A.M. ZANCHETTIN, P. ROCCO  
Constraint-based and sensorless force control with an application to a lightweight dual-arm robot  
**IEEE Robotics and Automation Letters**, Vol. 1, No. 1, pp. 340-347, January 2016.  
(also presented at ICRA 2016)
- [IJ40] N.M. CERIANI, A.M. ZANCHETTIN, P. ROCCO, A. STOLT, A. ROBERTSSON  
Reactive task adaptation based on hierarchical constraints classification for safe industrial robots  
**IEEE/ASME Transactions on Mechatronics**, Vol. 20, No. 6, pp. 2935-2949, December 2015
- [IJ39] A.M. ZANCHETTIN, B. LACEVIC, P. ROCCO  
Passivity-based control of robotic manipulators for safe cooperation with humans  
**International Journal of Control**, Vol. 28, No. 2, pp. 429-439, February 2015.
- [IJ38] G. BUIZZA AVANZINI, N.M. CERIANI, A.M. ZANCHETTIN, P. ROCCO, L. BASCETTA  
Safety control of industrial robots based on a distributed distance sensor  
**IEEE Transactions on Control Systems Technology**, Vol. 22, No. 6, pp. 2127-2140, November 2014.
- [IJ37] A.M. ZANCHETTIN, L. BASCETTA, P. ROCCO  
Achieving humanlike motion: resolving redundancy for anthropomorphic industrial manipulators  
**IEEE Robotics and Automation Magazine**, Vol. 20, No. 4, pp. 131-138, December 2013.
- [IJ36] A.M. ZANCHETTIN, L. BASCETTA, P. ROCCO  
Acceptability of robotic manipulators in shared working environments through human-like redundancy resolution  
**Applied Ergonomics**, Vol. 44, No. 6, pp. 982-989, November 2013.
- [IJ35] B. LACEVIC, P. ROCCO, A.M. ZANCHETTIN  
Safety assessment and control of robotic manipulators using danger field  
**IEEE Transactions on Robotics**, Vol. 29, No. 5, pp. 1257-1270, October 2013.
- [IJ34] L. BASCETTA, G. FERRETTI, G. MAGNANI, P. ROCCO  
Walk-through programming for robotic manipulators based on admittance control  
**Robotica**, Vol. 31, No. 7, pp. 1143-1153, October 2013
- [IJ33] B. LACEVIC, P. ROCCO  
Safety-Oriented Path Planning for Articulated Robots  
**Robotica**, Vol. 31, No. 6, pp. 861-874, September 2013.
- [IJ32] L. BASCETTA, P. ROCCO, A.M. ZANCHETTIN, G. MAGNANI  
Velocity control of a washing machine: a mechatronic approach  
**Mechatronics**, Vol. 22, No. 6, pp. 778-787, September 2012.
- [IJ31] A.M. ZANCHETTIN, P. ROCCO.



A general user-oriented framework for holonomic redundancy resolution in robotic manipulators using task augmentation.

**IEEE Transactions on Robotics** , Vol. 28, No. 2, pp. 514-521, April 2012.

[IJ30] B. LACEVIC, P. ROCCO.

Closed form solution to controller design for human-robot interaction.

**ASME Journal of Dynamic Systems, Measurement, and Control**, Vol. 133, No. 2, March 2011.

[IJ29] L. BASCETTA, P. ROCCO.

Revising robust control for rigid robot manipulators.

**IEEE Transactions on Robotics** , Vol. 26, No. 1, pp. 180-187, February 2010.

[IJ28] G. MAGNANI, P. ROCCO.

Mechatronic analysis of a complex transmission chain for performance optimization in a machine tool.

**Mechatronics**, Vol. 20, No. 1, pp. 85-101, February 2010

[IJ27] L. BASCETTA, G. MAGNANI, P. ROCCO, A. ZANCHETTIN.

Performance limitations in Field Oriented Control for asynchronous machines with low resolution position sensing.

**IEEE Transactions on Control Systems Technology** , Vol. 18, No. 3, pp. 559-573, May 2010.

[IJ26] L. BASCETTA, P. ROCCO, G. MAGNANI.

Force ripple compensation in linear motors based on closed loop position dependent identification.

**IEEE/ASME Transactions on Mechatronics** , Vol. 15, No. 3, pp. 349-359, June 2010.

[IJ25] L. BASCETTA, G. MAGNANI, P. ROCCO.

Velocity estimation: assessing the performance of non model-based techniques.

**IEEE Transactions on Control Systems Technology** , Vol. 17, No. 2, pp. 424-433, March 2009.

[IJ24] L. BASCETTA, P. ROCCO.

Two-time scale visual servoing of eye-in-hand flexible manipulators

**IEEE Transactions on Robotics** , Vol. 22, No. 4, pp. 818-830, August 2006.

[IJ23] L. BASCETTA, P. ROCCO.

End-point vibration sensing of planar flexible manipulators through visual servoing

**Mechatronics**, Vol. 16, pp. 221-232, 2006.

[IJ22] G.FERRETTI, G.MAGNANI, P.ROCCO, L. VIGANO

Modelling and Simulation of a Gripper with DYMOLA

**Mathematical and Computer Modelling of Dynamical Systems**, Vol. 12, pp. 89-102, 2006.

[IJ21] G.FERRETTI, G.MAGNANI, P.ROCCO

Single and Multi-State Integral Friction Models,

**IEEE Transactions on Automatic Control**, Vol. 49, December 2004, pp. 2292-2297.

[IJ20] G.FERRETTI, G.MAGNANI, P.ROCCO

Virtual Prototyping of Mechatronic Systems,

**Annual Reviews in Control**, Vol. 28, 2004, pp. 193-206.

[IJ19] G.FERRETTI, G.MAGNANI, P.ROCCO

Impedance Control for Elastic Joints Industrial Manipulators,  
**IEEE Transactions on Robotics and Automation**, Vol. 20, June 2004, pp. 488-498.

[IJ18] L. BASCETTA, P.ROCCO  
Modelling Flexible Manipulators with Motors at the Joints,  
**Mathematical and Computer Modelling of Dynamical Systems**, Vol. 8, 2002, pp. 157-183.

[IJ17] G.FERRETTI, G.MAGNANI, P.ROCCO  
Modeling and Experimental Analysis of the Vibrations in Hard Disk Drives,  
**IEEE/ASME Transactions on Mechatronics**, Vol. 7, June 2002, pp. 152-160.

[IJ16] C.MAFFEZZONI, P. ROCCO  
The Index of PDAEs Applied to the Modelling of a Flexible Mechanical System,  
**Mathematical and Computer Modelling of Dynamical Systems**, Vol.7, 2001, pp.305-321.

[IJ15] G.FERRETTI, G.MAGNANI, P.ROCCO  
Triangular Force/Position Control with Application to Robotic Deburring,  
**Machine Intelligence and Robotic Control**, Vol. 2, June/July 2000, pp. 83-91.

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A Modular Approach to Dynamic Virtual Reality Modeling of Robotic Systems,  
**IEEE Robotics and Automation Magazine**, Vol. 6, December 1999, pp. 13-23.

[IJ13] G.FERRETTI, G.MAGNANI, P.ROCCO  
Force Oscillations in Contact Motion of Industrial Robots: an Experimental Investigation,  
**IEEE/ASME Transactions on Mechatronics**, Vol. 4, March 1999, pp. 86-91.

[IJ12] G.FERRETTI, G.MAGNANI, P.ROCCO  
Modelling, Identification and Compensation of Pulsating Torque in Permanent Magnet AC Motors,  
**IEEE Transactions on Industrial Electronics**, Vol. 45, December 1998, pp. 912-920.

[IJ11] P.ROCCO  
Singular Perturbation Model of Robots with Elastic Joints and Elastic Links Constrained by Rigid Environment,  
**Journal of Intelligent and Robotic Systems**, Vol. 22, June 1998, pp. 143-152.

[IJ10] G.FERRETTI, G.MAGNANI, P.ROCCO  
Towards the Implementation of Hybrid Position/Force Control in Industrial Robots,  
**IEEE Transactions on Robotics and Automation**, Vol. 13, December 1997, pp. 838-844.

[IJ9] P.ROCCO, G.FERRETTI, G.MAGNANI  
Implicit Force Control for Industrial Robots in Contact with Stiff Surfaces,  
**Automatica**, Gran Bretagna, Vol. 33, November 1997, pp. 2041-2047.

[IJ8] P.ROCCO  
On 'Stability and Control of Elastic-Joint Robotic Manipulators During Constrained-Motion Tasks',  
**IEEE Transactions on Robotics and Automation**, Vol. 13, June 1997, pp. 467-469.

[IJ7] C.MAFFEZZONI, P.ROCCO  
Robust Tuning of PID Regulators Based on Step-Response Identification,  
**European Journal of Control**, Vol. 3, 1997, pp. 125-136.

[IJ6] P.ROCCO  
Stability of PID Control for Industrial Robot Arms,  
**IEEE Transactions on Robotics and Automation**, Vol.12, August 1996, pp. 606-614.

[IJ5] G.FERRETTI, G.MAGNANI, P.PUTZ, P.ROCCO  
The Structured Design of an Industrial Robot Controller,  
**Control Engineering Practice**, Vol.4, March 1996, pp.239-249.

[IJ4] G.FERRETTI, C.MAFFEZZONI, G.MAGNANI, P.ROCCO  
Simulating Discontinuous Phenomena Affecting Robot Motion,  
**Journal of Intelligent & Robotic Systems**, Vol.15, 1996, pp.53-65.

[IJ3] G.FERRETTI, G.MAGNANI, P.ROCCO  
On the Stability of Integral Force Control in Case of Contact with Stiff Surfaces,  
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