



CURRICULUM VITÆ GIANLUCA ANTONELLI

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Current position

Associate Professor at the Università degli Studi di Cassino, Cassino (FR), Italy, Engineering Faculty, from April, the 1st, 2005

Senior Member IEEE from June, 2006

History

Jan 2002 - Mar 2005	Assistant Professor (<i>Ricercatore</i>) at the Università degli Studi di Cassino, Italy
Aug 2000 - Jan 2002	Research Contract (<i>Assegno di ricerca</i>) at the Università degli Studi di Cassino, Italy
Jan 2000 - Jul 2000	Consulting Contract at the Department of Automation (DAEIMI), Università degli Studi di Cassino, Italy
Mar 2000	Philosophiæ Doctor (PhD) in <i>Ingegneria Elettronica e Informatica</i> , at the Università degli Studi di Napoli Federico II, Italy
Oct 1998 - May 1999	Visiting researcher at the University of Hawaii, Honolulu, Hawaii
Nov 1996 - Oct 1999	PhD Student in <i>Ingegneria Elettronica e Informatica</i> at the Università degli Studi di Napoli Federico II, Italy
Sep 1996 - Dec 1996	Visiting researcher at the Katholieke Universiteit Leuven, Heverlee, Belgium
Apr 1996 - Jun 1996	Visiting researcher at the Université Catholique de Louvain, Louvain-La-Neuve, Belgium
May 1995 - Feb 1996	Junior researcher at the <i>Fondazione FORMIT (Fondazione per la Ricerca sulla Migrazione e sulla Integrazione delle Tecnologie)</i> , Roma (I) and Brussels (B)
Mar 1995	Master degree in Electronic Engineering (<i>Laurea in Ingegneria Elettronica</i>) at the Università degli Studi di Napoli Federico II, Italy

Editorial activity

Associate Editor of the IEEE Transactions on Robotics from September 2005

Associate Editor for the IEEE RAS Conference Editorial Board From August 2006

Member of the International Program Committee for the 12 conferences:

- ▷ 2004, 2005, 2006, 2007 IEEE International Conference on Robotics and Automation



- ▷ 2005, 2007 IEEE/ASME International Conference on Advanced Intelligent Mechatronics
- ▷ 2004, 2005, 2006 IASTED International Conference on Robotics and Applications
- ▷ 2006 IEEE International Conference on Control, Automation, Robotics and Vision
- ▷ 2006 IEEE/RSJ International Conference on Intelligent Robots and Systems
- ▷ 2004 IEEE Conference on Control Applications

Educational activity

In the current academic year, 2006/2007, he is in charge of 3 modules at the University of Cassino for the Master Degrees in Telecommunication, Electric and Mechanical Engineering, namely: Digital Control, Identification and Data Analysis, Linear Systems

From the academic year 2001/2002, he held a total of 10 classes in the Automation topics

Scientific activity

2007–present	Member of a consulting group for COMAU Robotics, Torino, Italy
2006	Expert evaluator for the IST Advanced Robotics Call for proposals of the 6 Framework Program of the European Community
2003	Responsible of a research project funded by the Università degli Studi di Cassino, Italy
2003	Member of a consulting group for COMAU Robotics, Torino, Italy
2001–present	Member of 4 national research projects funded by the Italian Ministry of Education, University and Research
2001–present	Member of 5 national research projects funded by the Italian Space Agency
2001	Member of a consulting group for COMAU Robotics, Torino, Italy
1998	Member of a consulting group for Tecnomare, Venezia, Italy

Scientific distinction

- ⇒ Plenary talk at the 4th IEEE International Workshop on Robot Motion and Control, Puzszykowo, PL, 2004
- ⇒ Winner aex-equo of the *Euron PhD Award* as the best PhD Thesis in the European Robotic Network (Euron) for the years 1999-2000
- ⇒ Co-author of the paper awarded as the *Best Student Paper Award* at the IEEE International Conference on Robotics and Automation, San Francisco, CA, 2000
- ⇒ Finalist of the *Best Student Paper Award* at the IEEE International Conference on Robotics and Automation, Detroit, MI, 1999



List of publications

Books

- [1] G. Antonelli. *Underwater robots. Motion and force control of vehicle-manipulator systems*. Springer Tracts in Advanced Robotics, Springer-Verlag, Heidelberg, D, 2nd edition, June 2006.
- [2] G. Antonelli. *Underwater robots. Motion and force control of vehicle-manipulator systems*. Springer Tracts in Advanced Robotics, Springer-Verlag, Heidelberg, D, January 2003.

Book's chapter

- [1] G. Antonelli. *Fault diagnosis and tolerance for mechatronic systems. Recent advances*, chapter A survey of fault detection/tolerance strategies for AUVs and ROVs, pages 109–127. F. Caccavale, L. Villani, (Eds.), Springer Tracts in Advanced Robotics, Springer-Verlag, Heidelberg, D, 2002.

International journal papers

- [1] G. Antonelli. On the use of adaptive/integral actions for 6-degrees-of-freedom control of autonomous underwater vehicles. *accepted IEEE Journal of Oceanic Engineering*, 2007.
- [2] G. Antonelli, F. Arrichiello, and S. Chiaverini. The Null-Space-based Behavioral control for autonomous robotic systems. *accepted International Journal of Intelligent Service Robotics*.
- [3] G. Antonelli, S. Chiaverini, M. Palladino, G. Gerio, and G. Renga. SmartMove4: An industrial implementation of trajectory planning for robots. *Journal of Industrial Robots*, 34(3), May 2007.
- [4] G. Antonelli and S. Chiaverini. Kinematic control of platoons of autonomous vehicles. *IEEE Transactions on Robotics*, 22(6):1285–1292, Dec. 2006.
- [5] G. Antonelli, S. Chiaverini, and G. Fusco. A fuzzy-logic based approach for mobile robot path tracking. *IEEE Transactions on Fuzzy Systems*, 2006.
- [6] G. Antonelli, F. Arrichiello, S. Chiaverini, and R. Setola. Coordinated control of mobile antennas for ad-hoc networks. *International Journal of Modelling Identification and Control Special/Inaugural issue on Intelligent Robot Systems*, 1(1):63–71, 2006.
- [7] G. Antonelli, S. Chiaverini, and G. Fusco. A systematic calibration method for odometry of mobile robots based on the least-squares technique: theory and experimental validation. *IEEE Transactions on Robotics*, 21(5):994–1004, Oct. 2005.
- [8] G. Antonelli, F. Caccavale, and S. Chiaverini. Adaptive tracking control of underwater vehicle-manipulator systems based on the virtual decomposition approach. *IEEE Transactions on Robotics and Automation*, 20(3):594–602, June 2004.
- [9] G. Antonelli, F. Caccavale, S. Chiaverini, and G. Fusco. A novel adaptive control law for underwater vehicles. *IEEE Transactions on Control Systems Technology*, 11(2):221–232, 2003.
- [10] G. Antonelli and S. Chiaverini. Fuzzy redundancy resolution and motion coordination for underwater vehicle-manipulator systems. *IEEE Transactions on Fuzzy Systems*, 11(1):109–120, 2003.
- [11] G. Antonelli and S. Chiaverini. A fuzzy approach to redundancy resolution for underwater vehicle-manipulator systems. *Control Engineering Practice*, 11(4):445–452, 2003.
- [12] G. Antonelli, S. Chiaverini, and G. Fusco. A new on-line algorithm for inverse kinematics of robot manipulators ensuring path tracking capability under joint limits. *IEEE Transactions on Robotics and Automation*, 19(1):162–167, 2003.
- [13] G. Antonelli, N. Sarkar, and S. Chiaverini. Explicit force control for underwater vehicle-manipulator systems. *Robotica*, 20(3):251–260, 2002.
- [14] N. Sarkar, T.K. Podder, and G. Antonelli. Fault accommodating thruster force allocation of an AUV considering thruster redundancy and saturation. *IEEE Transactions on Robotics and Automation*, 18(2):223–233, April 2002.



- [15] G. Antonelli, S. Chiaverini, and N. Sarkar. External force control for underwater vehicle-manipulator systems. *IEEE Transactions on Robotics and Automation*, 17(6):931–938, December 2001.
- [16] T.K. Podder, G. Antonelli, and N. Sarkar. An experimental investigation into the fault-tolerant control of an autonomous underwater vehicle. *Journal of Advanced Robotics*, 15(5):501–520, 2001.
- [17] G. Antonelli, S. Chiaverini, N. Sarkar, and M. West. Adaptive control of an autonomous underwater vehicle: experimental results on ODIN. *IEEE Transactions on Control Systems Technology*, 9(5):756–765, 2001.
- [18] G. Antonelli, S. Chiaverini, R. Finotello, and R. Schiavon. Real-time path planning and obstacle avoidance for raia: an autonomous underwater vehicle. *IEEE Journal of Oceanic Engineering*, 26(2):216–227, 2001.
- [19] G. Antonelli, F. Caccavale, S. Chiaverini, and L. Villani. Tracking control for underwater vehicle-manipulator systems with velocity estimation. *IEEE Journal of Oceanic Engineering*, 25(3):399–413, 2000.
- [20] G. Antonelli, F. Caccavale, and P. Chiacchio. A systematic procedure for the identification of dynamic parameters of robot manipulators. *Robotica*, 17:427–435, 1999.

International conference papers

- [1] G. Antonelli, F. Arrichiello, S. Chakrabarti, and S. Chiaverini. Experiences of formation control of multi-robot systems with the Null-Space-based Behavioral control. In *Proceedings 2007 IEEE International Conference on Robotics and Automation*, Roma, I, April 2007.
- [2] G. Antonelli and S. Chiaverini. Linear estimation of the odometric parameters for differential-drive mobile robots. In *2006 IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 3287–3292, Beijing, PRC, Oct. 2006.
- [3] G. Antonelli, F. Arrichiello, S. Chiaverini, and K. J. Rao. Preliminary experiments of formation control using the Null-Space-based Behavioral control. In *8th IFAC Symposium on Robot Control*, Bologna, I, Sept. 2006.
- [4] G. Antonelli, F. Arrichiello, and S. Chiaverini. Experiments of formation control with collisions avoidance using the Null-Space-based Behavioral control. In *14th Mediterranean Conference on Control and Automation*, Ancona, I, June 2006.
- [5] G. Antonelli. An adaptive law for guidance and control of remotely operated vehicles. In *14th Mediterranean Conference on Control and Automation*, Ancona, I, June 2006.
- [6] G. Antonelli. Adaptive/integral actions for 6-DOF control of AUVs. In *Proceedings 2006 IEEE International Conference on Robotics and Automation*, pages 3214–3219, Orlando, FL, May 2006.
- [7] G. Antonelli, F. Arrichiello, S. Chiaverini, and R. Setola. Coordinated control of mobile antennas for ad-hoc networks in cluttered environments. In *Proceedings 9th International Conference on Intelligent Autonomous Systems (IAS-9)*, pages 235–242, Tokyo, J, March 2006.
- [8] G. Antonelli and S. Chiaverini. The stock markets as an ineffective sampler. In *44th IEEE Conference on Decision and Control and 8th European Control Conference*, pages 5233–5238, Sevilla, E, Dec. 2005.
- [9] G. Antonelli, F. Arrichiello, S. Chiaverini, and R. Setola. A self-configuring MANET for coverage area adaptation through kinematic control of a platoon of mobile robots. In *Proceedings IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 1332–1337, Edmonton, CA, Aug. 2005.
- [10] G. Antonelli, F. Arrichiello, and S. Chiaverini. The Null-Space-Based behavioral control for soccer-playing mobile robots. In *2005 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, pages 1257–1262, Monterey, CA, July 2005.
- [11] G. Antonelli, F. Arrichiello, and S. Chiaverini. Experimental kinematic comparison of behavioral approaches for mobile robots. In *16th IFAC World Congress*, Praha, CZ, July 2005.
- [12] G. Antonelli, S. Chiaverini, M. Palladino, G. Gerio, and G. Renga. Joint space point-to-point motion planning for robots. An industrial implementation. In *16th IFAC World Congress*, Praha, CZ, July 2005.
- [13] G. Antonelli and S. Chiaverini. Experimental odometry calibration of the mobile robot Khepera II based on the least-squares technique. In *Proceedings 2005 IEEE International Conference on Robotics and Automation*, pages 1477–1482, Barcelona, E, April 2005.
- [14] G. Antonelli, F. Caccavale, C. Sansone, and L. Villani. Diagnosis of actuator faults in AUVs based on neural networks. In *IFAC Conference on Control Applications in Marine Systems - CAMS 2004*, pages 89–94, Ancona, I, July 2004.



- [15] G. Antonelli, S. Chiaverini, and S. Costantini. An experimental implementation of sensor fusion for mobile robots based on Kalman filtering. In *International Symposium on Robotics and Applications (ISORA 2004)*, pages 479–484, Seville, E, July 2004.
- [16] G. Antonelli. Open control problems in underwater robotics. In *4th International Workshop on Robot Motion and Control*, pages 219–229, Puszczkowo, PL, June 2004.
- [17] G. Antonelli, S. Chiaverini, M. Palladino, G. Gerio, and G. Renga. Cartesian space motion planning for robots. An industrial implementation. In *4th International Workshop on Robot Motion and Control*, pages 279–284, Puszczkowo, PL, June 2004.
- [18] G. Antonelli, S. Chiaverini, M. Palladino, G. Gerio, and G. Renga. Joint space fly motion planning for robots. an industrial implementation. In *12th Mediterranean Conference on Control and Automation*, Kusadasi, T, June 2004.
- [19] G. Antonelli and S. Chiaverini. Experiments of fuzzy lane following for mobile robots. In *Proceedings 2004 American Control Conference*, pages 1079–1084, Boston, MA, June 2004.
- [20] G. Antonelli, F. Caccavale, C. Sansone, and L. Villani. Fault diagnosis for AUVs using support vector machines. In *Proceedings 2004 IEEE International Conference on Robotics and Automation*, pages 4486–4491, New Orleans, LA, April 2004.
- [21] G. Antonelli and S. Chiaverini. Fault tolerant kinematic control of platoons of autonomous vehicles. In *Proceedings 2004 IEEE International Conference on Robotics and Automation*, pages 3313–3318, New Orleans, LA, April 2004.
- [22] G. Antonelli, F. Caccavale, and L. Villani. Adaptive discrete-time fault diagnosis for a class of nonlinear systems. In *2003 IEEE International Symposium on Intelligent Control (ISIC)*, Houston, TX, Oct. 2003.
- [23] G. Antonelli and S. Chiaverini. Obstacle avoidance for a platoon of autonomous underwater vehicles. In *Proceedings 6th IFAC Conference on Manoeuvring and Control of Marine Craft*, pages 143–148, Girona, E, Sept. 2003.
- [24] G. Antonelli, S. Chiaverini, and G. Fusco. Exciting trajectories for mobile robot odometry calibration. In *Preprints 7th IFAC Symposium on Robot Control*, pages 429–434, Wroclaw, PL, Sept. 2003.
- [25] G. Antonelli and S. Chiaverini. Kinematic control of a platoon of autonomous vehicles. In *Proceedings 2003 IEEE International Conference on Robotics and Automation*, pages 1464–1469, Taipei, TW, Sept. 2003.
- [26] G. Antonelli, S. Chiaverini, and G. Fusco. An odometry calibration method for mobile robots based on the least-squares technique. In *Proceedings 2003 American Control Conference*, pages 3429–3434, Denver, CO, June 2003.
- [27] G. Antonelli, S. Chiaverini, and G. Fusco. Experiments of on-line path following under joint limits for an industrial robot manipulator. In *2002 IEEE Conference on Control Applications*, pages 513–518, Glasgow, UK, Sept. 2002.
- [28] G. Antonelli, F. Caccavale, S. Chiaverini, and G. Fusco. A modular control law for underwater vehicle-manipulator systems adapting on a minimum set of parameters. In *15th Ifac World Congress*, Barcelona, Spain, July 2002.
- [29] G. Antonelli, F. Caccavale, S. Chiaverini, and G. Fusco. On the use of integral control actions for autonomous underwater vehicles. In *2001 European Control Conference*, Porto, P, Sept. 2001.
- [30] G. Antonelli, S. Chiaverini, and G. Fusco. Real-Time end-effector path following for robot manipulators subject to velocity, acceleration, and jerk joint limits. In *2001 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, pages 452–457, Como, I, July 2001.
- [31] G. Antonelli, F. Caccavale, and S. Chiaverini. A virtual decomposition based approach to adaptive control of underwater vehicle-manipulator systems. In *9th Mediterranean Conference on Control and Automation*, Dubrovnik, HR, June 2001.
- [32] G. Antonelli, S. Chiaverini, and G. Fusco. Real-Time path tracking for unicycle-like mobile robots under velocity and acceleration constraints. In *Proceedings 2001 American Control Conference*, pages 119–124, Arlington, VA, June 2001.
- [33] G. Antonelli, F. Caccavale, S. Chiaverini, and G. Fusco. A novel adaptive control law for autonomous underwater vehicles. In *Proceedings 2001 IEEE International Conference on Robotics and Automation*, pages 447–451, Seoul, KR, May 2001.
- [34] G. Antonelli, S. Chiaverini, and G. Fusco. An algorithm for on-line inverse kinematics with path tracking capability under velocity and acceleration constraints. In *39th IEEE Conference on Decision and Control*, pages 5079–5084, Sidney, AU, Dec. 2000.
- [35] G. Antonelli, S. Chiaverini, and G. Fusco. Effects analysis of load inertia variations on the performance of an H_∞ position controller for induction motors. In *6th International Conference on Control, Automation, Robotics and Vision*, Singapore, Dec. 2000.

- [36] G. Antonelli, S. Chiaverini, and G. Fusco. Kinematic control of redundant manipulators with on-line end-effector path tracking capability under velocity and acceleration constraints. In *6th IFAC Symposium on Robot Control*, pages 609–617, Wien, A, Sept. 2000.
- [37] G. Antonelli, F. Caccavale, S. Chiaverini, and L. Villani. Control of underwater vehicle-manipulator systems using only position and orientation measurements. In *6th IFAC Symposium on Robot Control*, pages 463–468, Wien, A, Sept. 2000.
- [38] G. Antonelli and S. Chiaverini. A fuzzy approach to redundancy resolution for underwater vehicle-manipulator systems. In *Proceedings 5th IFAC Conference on Manoeuvring and Control of Marine Craft*, Aalborg, DK, Aug. 2000.
- [39] G. Antonelli and S. Chiaverini. Fuzzy inverse kinematics for underwater vehicle-manipulator systems. In J. Lenarčič Advances in Robot Kinematics and Dordrecht NL M.M. Stanišić (Eds.), Kluwer Academic Publishers, editors, *7th International Symposium on Advances in Robot Kinematics*, pages 249–256, Piran-Portorož, SLO, June 2000.
- [40] T.K. Podder, G. Antonelli, and N. Sarkar. Fault tolerant control of an autonomous underwater vehicle under thruster redundancy: simulations and experiments. In *Proceedings 2000 IEEE International Conference on Robotics and Automation*, pages 1251–1256, San Francisco, CA, April 2000.
- [41] G. Antonelli, N. Sarkar, and S. Chiaverini. External force control for underwater vehicle-manipulator systems. In *38th IEEE Conference on Decision and Control*, pages 2975–2980, Phoenix, AZ, Dec. 1999.
- [42] G. Antonelli, S. Chiaverini, N. Sarkar, and M. West. Adaptive control of an autonomous underwater vehicle. experimental results on ODIN. In *IEEE International Symposium on Computational Intelligence in Robotics and Automation*, pages 64–69, Monterey, CA, Nov. 1999.
- [43] G. Antonelli, S. Chiaverini, and N. Sarkar. An explicit force control scheme for underwater vehicle-manipulator systems. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 136–141, Kyongju, KR, Oct. 1999.
- [44] G. Antonelli and S. Chiaverini. Real-Time motion planning for autonomous underwater vehicles. In *14th Ifac World Congress*, volume B, pages 59–64, Beijing, PRC, July 1999.
- [45] G. Antonelli, S. Chiaverini, and N. Sarkar. Explicit force control for underwater vehicle-manipulator systems with adaptive motion control law. In *IEEE Hong Kong Symposium on Robotics and Control*, pages 361–366, Hong Kong, PRC, July 1999.
- [46] G. Antonelli, F. Caccavale, and S. Chiaverini. A modular scheme for adaptive control of underwater vehicle-manipulator systems. In *Proceedings 1999 American Control Conference*, pages 3008–3012, San Diego, CA, June 1999.
- [47] G. Antonelli, S. Chiaverini, R. Finotello, and E. Morgavi. Real-Time path planning and obstacle avoidance for an autonomous underwater vehicle. In *Proceedings 1999 IEEE International Conference on Robotics and Automation*, pages 78–83, Detroit, MI, May 1999.
- [48] G. Antonelli, F. Caccavale, S. Chiaverini, and L. Villani. An output feedback algorithm for position and attitude tracking control of underwater vehicles. In *37th IEEE Conference on Decision and Control*, pages 4567–4572, Tampa, FL, Dec. 1998.
- [49] R. Gorez and G. Antonelli. Globally stable dual-mode control of robots. In *IFAC Motion Control*, pages 120–125, Grenoble, F, Sept. 1998.
- [50] G. Antonelli and S. Chiaverini. Adaptive tracking control of underwater vehicle-manipulator systems. In *IEEE Conference on Control Applications*, pages 1089–1093, Trieste, I, Sept. 1998.
- [51] G. Antonelli and S. Chiaverini. Singularity-free regulation of underwater vehicle-manipulator systems. In *Proceedings 1998 American Control Conference*, pages 399–403, Philadelphia, PA, June 1998.
- [52] G. Antonelli and S. Chiaverini. Task-priority redundancy resolution for underwater vehicle-manipulator systems. In *Proceedings 1998 IEEE International Conference on Robotics and Automation*, pages 768–773, Leuven, B, May 1998.
- [53] W.H. Zhu, G. Antonelli, and J. De Schutter. Virtual decomposition based adaptive control for robot manipulators: theory and experiments. In *5th IFAC Symposium on Robot Control*, pages 239–245, Nantes, F, Sept. 1997.
- [54] R. Gorez, G. Antonelli, and C. Ganseman. Design of PID-like robot controllers via VSS approach. In *5th IFAC Symposium on Robot Control*, pages 137–144, Nantes, F, Sept. 1997.
- [55] R. Gorez, R. Zanasi, G. Antonelli, C. Ganseman, and J. De Schutter. Introduction of a reset action in sliding mode control of robot manipulators. In *1997 European Control Conference*, pages 769–775, Brussels, B, July 1997.