

CURRICULUM VITAE

FORMATO EUROPEO/EUROPEAN FORMAT

INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

Nome, Cognome/Name, Surname Elisabetta, PUNTA

ESPERIENZA PROFESSIONALE /WORK EXPERIENCE

Se dipendente CNR indicare: **QUALIFICA - RICERCATORE
LIVELLO – III LIV.**

In ordine di data /Dates (from – to)	Since 2005
Nome e indirizzo del datore di lavoro/ Name and address of employer	Institute of Electronics, Computer and Telecommunication Engineering (CNR-IEIIT), Turin, Italy National Research Council of Italy (CNR)
Tipo o settore di attività / Type of business or sector	Institute of Electronics, Computer and Telecommunication Engineering (CNR-IEIIT) Institute of Intelligent Systems for Automation (CNR-ISSIA , 2005-2013)
Funzione o posto occupato / Occupation or position held	Researcher since 03/10/2005 (since 01/02/2010 permanent position)
Principali mansioni e responsabilità / Main activities and responsibilities	Scientific work, research activity, lectures and seminars, projects.
In ordine di data /Dates (from – to)	From 2003 to 2005
Nome e indirizzo del datore di lavoro / Name and address of employer	Institute of Intelligent Systems for Automation (CNR-ISSIA , Genoa Branch), Genoa, Italy
Tipo o settore di attività / Type of business or sector	National Research Council of Italy (CNR)
Funzione o posto occupato / Occupation or position held	Research Fellow
Principali mansioni e responsabilità / Main activities and responsibilities	Scientific work, research activity, lectures and seminars, projects.

In ordine di data /Dates (from – to)	From 1998 to 2003
Nome e indirizzo del datore di lavoro/ Name and address of employer	Dept. of Communications, Computer and Systems Sciences (DIST), University of Genoa , Genoa, Italy
Tipo o settore di attività / Type of business or sector	University of Genoa – Higher Education
Funzione o posto occupato / Occupation or position held	Research Fellow
Principali mansioni e responsabilità / Main activities and responsibilities	Scientific work, research activity, lectures and seminars, projects.

ISTRUZIONE E FORMAZIONE / EDUCATION AND TRAINING

In ordine di data / Dates (from – to)	From 1994 to 1998
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	University of Genoa, Genoa, Italy; University of Rome "Tor Vergata", Rome, Italy (Final Examination).
Principali materie e competenze professionali apprese / Principal subjects and occupational skills covered	Title of the Thesis: "Simulation and Control of Mechanical Systems via Second Order Sliding Modes". Supervisor: Prof. Giorgio Bartolini. Subjects: Nonlinear Control; Nonlinear Observers; Modeling and Simulation of Complex Systems; Sliding Modes and Higher Order Sliding Modes.
Certificato o diploma ottenuto / Title of qualification awarded	Ph.D. (Dottorato di Ricerca) in Electronic Engineering and Computer Science.

In ordine di data / Dates (from – to)	From 1985 to 1993
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	University of Genoa, Genoa, Italy.
Principali materie e competenze professionali apprese / Principal subjects occupational skills covered	Title of the Thesis: "Sliding Modes Techniques to Design and Control Biped Robots". Supervisor: Prof. Giorgio Bartolini. Subjects: Nonlinear Control; Modeling and Simulation of Complex Systems; Sliding Modes.
Certificato o diploma ottenuto / Title of qualification awarded	Master (Laurea) in Electronic Engineering.

ATTIVITÀ DI RICERCA / RESEARCH ACTIVITIES

Attuali campi di ricerca / Research sectors.	Variable Structure Systems, Sliding Mode Control Theory, Higher Order Sliding Mode Control , Sliding Mode Observers , Nonlinear Control, Nonlinear Observers, Mechanical Systems , Aerospace Systems , Time Delay Systems, Thermoelectric Power Plants with Combined Gas-Steam Cycle, Energy Production Systems, Energy Management Systems, Complex Systems, and Control and Optimization Methods for Freeways.
Recenti attività scientifiche / Recent Scientific Activities.	<ul style="list-style-type: none"> • Senior Member IEEE (Control Systems Society). • Member of the Conference Editorial Board (CEB) of the IEEE Control Systems Society (CSS) since 2007. • Member of the IEEE-CSS Technical Committee on Variable Structure and Sliding Mode Control since 2016. • Member of the International Program Committee of the International Workshop on Variable Structure Systems (VSS 2006, Alghero, Italy, 2006; VSS 2008, Antalya, Turkey, 2008; VSS 2010, Mexico City, Mexico, 2010; VSS 2012, Mumbai, India, 2012; VSS 2014 Nantes, France) . • Member of SIDRA (Italian Society of the Professors and Researchers in Automatic Control). • Referee for several international journals and conferences. • Reviewer for Mathematical Reviews since 2008.

Recenti attività scientifiche /
Recent Scientific Activities.

- **Subject Editor** for "**International Journal of Adaptive Control and Signal Processing**" since 2012.
- **Associate Editor** for "**IMA Journal of Mathematical Control and Information**" since 2012.

Pubblicazioni / Books and Articles.

Author and co-author of more than 90 works published in international journals, books, and proceedings of international conferences.

ULTERIORI INFORMAZIONI / ADDITIONAL INFORMATION

Responsabilità di Progetti di Ricerca /
Direction of Research Projects.

- Italian project leader of the joint project "**Fault detection of production processes and monitoring of complex systems based on nonlinear sliding mode techniques for state observation and control**" (2013-2015) within the Agreement on Scientific and Technological Cooperation between Consiglio Nazionale delle Ricerche (Italy) and Consejo Nacional de Ciencia y Tecnología (United Mexican States); project leaders are Prof. Leonid Fridman (UNAM) and Dr. Elisabetta Punta (CNR-IEIIT).
- Italian project leader of the joint project "**State observation for complex systems based on nonlinear sliding mode techniques**" (2009-2011) within the Agreement on Scientific and Technological Cooperation between Consiglio Nazionale delle Ricerche (Italy) and Consejo Nacional de Ciencia y Tecnología (United Mexican States); project leaders are Prof. Leonid Fridman (UNAM) and Dr. Elisabetta Punta (CNR-ISSIA).
- Project Proponent and Scientific Responsible of the Research Project in cooperation with Prof. Arie Levant (Tel-Aviv University, Israel) "**Analysis and Synthesis of Control and Observation Processes for Nonlinear Uncertain Systems via Higher Order Sliding Mode**" (CNR Short Term Mobility Program, 2010).
- Responsible for ISSIA-CNR in Genoa of the Training Project for graduated students on "**Modeling and simulation of complex systems and industrial plants**" (PRAI-FESR Regional Program of Innovative Actions of the European Fund for Regional Development, 2005-07).
- Leader of the research project "**Innovative electro-hydraulic system with a large bandwidth for the actuation of dexterous manipulators**" (CNR, Young Researchers' Projects, line of research: Industrial Fluid Dynamics, 2001).
- Leader with Dr. Laura Levaggi of the research project "**Variable Structure Control of Infinite Dimensional Systems**" (University of Genoa, Program for Young Researchers' Projects, 2000).
- Leader of the research project "**Design and Control of Dexterous Robotic Manipulators Prototypes**" (University of Genoa, Program for Young Researchers' Projects, 2000).

Partecipazione a Progetti di Ricerca /
Participation in Research Projects.

- **Joint International Lab COOPS** on EMS – Energy Management Systems (CNR Italy and JST Japan, 2015-17).
- **Thermoelectric Power Plants with Combined Gas-Steam Cycle** (MUR-FAR Fund for Research of the Italian Ministry of University and Research, 2005-10).
- **Higher Order Sliding Mode Control and Observation of Nonlinear Systems** (Research Project in cooperation with Prof. Arie Levant (Tel-Aviv University, Israel) under the CNR Short Term Mobility Program. Project Proponent: Dr. Marta Cuneo (CNR-ISSIA). Scientific Responsible: Dr. E. Punta (CNR-ISSIA), 2009).
- **Numerical Simulation** (PRAI-FESR Regional Program of Innovative Actions of the European Fund for Regional Development, 2005-07).
- **Modeling, Simulation and Control of Complex Plants** (CNR-ISSIA and Ansaldo Energia, since 2003).
- **Underwater Robotic Manipulation** (AMADEUS 1 and 2 projects of the EU-Mast II, Phase I, 1994-96 and EU Mast III, Phase II, 1997-99).
- **Freeway Traffic Control** (PFT 1 and 2 Transportation Systems Projects of the Italian CNR, 1995-97).
- **Biped Robots** (PFR Robotic Project of the Italian CNR, 1993-94).

Idoneità / Qualifications.

In 2005 qualification of **Associate Professor (Maître de Conférences) of France**.
In 2014 qualification of **Associate Professor (Professore Associato) of Italy**.

Attività di Esperto Valutatore /
Expert Evaluator.

- **Expert Evaluator** of projects under the programme Marie Curie **FP7-PEOPLE-2012-IEF-IIF-IOF**, **FP7-PEOPLE-2013-IEF-IIF-IOF**, **H2020-MSCA-IF-2014-ST** and **H2020-MSCA-IF-2015-ST**, Mathematics and Engineering (**MATENG**) panels, Research Executive Agency (**REA**), **European Commission**.
- **Commissioner** in several competitions for research positions and technical staff of the National Research Council.
- **Member** of the final examination commission for **PhD degree in Mathematics and Engineering Simulation** at the **University of Genoa** in 2010 (Examiner) and 2012.
- **External Examiner** (2013) for a **PhD candidate** at the **University of Hull**.

Tirocini e Borse di Studio /
Traineeships and Fellowships.

In 1998 and in 2000 she was at the EECS, Electrical Engineering and Computer Science Department, of the Tulane University, New Orleans, Louisiana, working with Prof. Sergey Drakunov (**Research Traineeships for Graduated of the University of Genoa** and **NSF Postdoctoral Fellowship for Scientists**).

Attività Didattica / Teaching Activity.

- Professor of Automatic Control at the International Telematics University UNINETTUNO since 2016.
- Courses of Automatic Control at the University of Genoa and at the Polytechnic of Milan.
- Co-advisor of dissertations of the University of Genoa and University of Trieste.
- Seminars at Industries and foreign Universities.

- [J1]** E. Capello, E. Punta, F. Dabbene, G. Guglieri, R. Tempo, "Sliding Mode Control Strategies for Rendezvous and Docking Maneuvers," *Journal of Guidance Control and Dynamics*, vol. 40 n. 6, pp. 1481-1487, 2017.
- [J2]** H. Rios, E. Punta, L. Fridman, "Fault detection and isolation for nonlinear non-affine uncertain systems via sliding-mode techniques," *International Journal of Control*, vol. 90, no. 2, pp. 218-230, 2017.
- [J3]** G. Bartolini, A. Estrada, E. Punta, "Adaptive tracking of sinusoids with unknown frequencies for some classes of SISO non-minimum phase systems," *International Journal of Adaptive Control and Signal Processing*, vol. 30, pp. 1163-1183, 2016.
- [J4]** G. Bartolini, A. Estrada, E. Punta, "Observation and output adaptive tracking for a class of nonlinear non-minimum phase systems," *International Journal of Control*, vol. 89, no. 9, pp. 1807-1820, 2016.
- [J5]** G. Bartolini, E. Punta, "Multi-Input Sliding Mode Control of Nonlinear Uncertain Non-Affine Systems With Mono-Directional Actuation," *IEEE Transactions on Automatic Control*, vol. 60, no. 2, pp. 393-403, 2015.
- [J6]** A. Ferreira de Loza, E. Punta, L. Fridman, G. Bartolini, S. Delprat, "Nested backward compensation of unmatched perturbations via HOSM observation," *Journal of the Franklin Institute*, vol. 351, no. 5, pp. 2397-2410, 2014.
- [J7]** G. Bartolini, A. Levant, F. Plestan, M. Taleb, E. Punta, "Adaptation of Sliding Modes," *IMA Journal of Mathematical Control and Information*, vol. 30, no. 3, pp. 285-300, 2013.
- [J8]** G. Bartolini, E. Punta, "Sliding Mode Output-Feedback Stabilization of Uncertain Nonlinear Nonaffine Systems," *Automatica*, vol. 48, no. 12, pp. 3106-3113, 2012.
- [J9]** G. Bartolini, E. Punta, "Simplex Sliding Mode Control of Multi-Input Systems with Chattering Reduction and Mono-Directional Actuators," *Automatica*, vol. 47, no. 11, pp. 2433-2437, 2011.
- [J10]** G. Bartolini, E. Punta, T. Zolezzi, "Multi-Input Sliding Mode Control of Nonlinear Uncertain Affine Systems," *International Journal of Control*, vol. 84, no. 5, pp. 867-875, 2011.
- [J11]** G. Bartolini, E. Punta, "Reduced-Order Observer in the Sliding Mode Control of Nonlinear Non-Affine Systems," *IEEE Transactions on Automatic Control*, vol. 55, no. 10, pp. 2368-2373, 2010.
- [J12]** G. Bartolini, E. Punta, "Reduced order observers for the sliding mode control of mechanical systems with elastic joints," *International Journal of Control*, vol. 87, no. 7, pp. 1364-1373, 2010.
- [J13]** G. Bartolini, E. Punta, T. Zolezzi, "Simplex sliding mode methods for the chattering reduction control of multi-input nonlinear uncertain systems," *Automatica*, vol. 45, no. 8, pp. 1923-1928, 2009.
- [J14]** L. Levaggi, E. Punta, "Analysis of a second order sliding mode algorithm in presence of input delays," *IEEE Transactions on Automatic Control*, vol. 51, no. 8, pp. 1325-1332, 2006.
- [J15]** A. Alessandri, A. Di Febraro, A. Ferrara, E. Punta, "Optimal control of freeways via speed signalling and ramp metering," *Control Engineering Practice*, vol. 6, no. 6, pp. 771-780, 1998.
- [C1]** E. Capello, E. Punta, G. Bartolini, "Simplex Sliding Mode Control Strategies for Spacecraft Rendezvous Maneuvers (Invited)," the 20th IFAC World Congress, Toulouse, France, July 9-14, 2017.
- [C2]** E. Capello, E. Punta, L. Fridman, "Strategies for Control, Fault Detection and Isolation Via Sliding Mode Techniques for a 3-DOF Helicopter," the 55th IEEE Conference on Decision and Control - CDC 2016, Las Vegas, NV, USA, December 12-14, 2016.
- [C3]** V. Arrichiello, G. Bartolini, A. Pisano, E. Punta, E. Usai, T. Zolezzi, "Attitude and position tracking of autonomous 6 d.o.f. vehicles with mono-directional actuators," the 14th IEEE International Workshop on Variable Structure Systems - VSS 2016, Nanjing, China, June 1-4, 2016.
- [C4]** E. Punta (Invited Plenary Talk), "Integral Sliding Mode Control of Multi-input Nonlinear Uncertain Non-affine Systems (invited work with G. Bartolini, not in the proceedings)," International Workshop on Recent Advances in Sliding Modes - RASM 2015, April 9-11, 2015, Istanbul, Turkey.
- [C5]** E. Capello, F. Dabbene, G. Guglieri, E. Punta, R. Tempo, "Rendez-Vous and Docking Position Tracking via Sliding Mode Control," the 2015 American Control Conference - ACC 2015, Chicago, IL, USA, July 1-3, 2015.
- [C6]** H. Rios, E. Punta, L. Fridman, "Fault detection for nonlinear non-affine systems via sliding-mode output-feedback and HOSM differentiator," the 13th IEEE International Workshop on Variable Structure Systems - VSS 2014, Nantes, France, June 29-July 2, 2014.
- [C7]** G. Bartolini, A. Estrada, E. Punta, "Output Regulation of Some Classes of SISO Non-Minimum Phase Non-Affine Systems (Invited)," the 52nd IEEE Conference on Decision and Control - CDC 2013, Florence, Italy, December 10-13, 2013.

Turin, September 6, 2017