SHORT CV

Rezia Maria Molfino
University of Genova Professor of Robotics

BIOGRAPHIC DATA AND EDUCATION ☐ Born in Celle ligure (SV) on 29 January 1943. ☐ Classical maturity in 1961. ☐ Graduated in Electrical Engineering at the University of Genoa (UNIGE) in 1966. ☐ Siemens, Milano 1966 fellowship (electrical engineer student's award)
WORK EXPERIENCE IN THE AREAS OF RESEARCH AND DEVELOPMENT of the companies: ☐ CETENA (Center for studies of naval tenica) in Genoa in the period 1967-1968 ☐ ELSAG (Elettronica San Giorgio) in Genoa in the period 1968-1971.

ACADEMIC ROUTE ☐ University of Genoa: ☐ Ordinary assistant to the Chair of Construction of Machines and then to that of Industrial Measures and Instrumentation since 1971. ☐ Associate Professor of Control of Mechanical Systems since 1980. ☐ Extraordinary Professor of Mechanical Systems Control since 1987 ☐ Full Professor of Regulation and Control of Mechanical Systems since 1990 ☐ Professor in charge of Mechanics applied to Machines a.a.1993/94 ☐ Professor in charge of Robot Mechanics a.a.1993/94 ☐ Professor of Industrial and Service Robotics, Robot programming methods, Mechanical design methods in robotics, Flexible automation ☐ Retired on 11/11/2013. ☐ Adjunct Professor of Flexible Automation in LM EMARO and Robotics Engineering (DIBRIS) from 2013 to present.

RESEARCH ☐ She has carried out interdisciplinary research activities in the fields of complex mechatronic systems including machine mechanics, sensory-actuation, regulation and control, intuitive interfaces, expert systems, AI in particular with reference to the fields of Robotics and Flexible automation.
The study and research in the robotic field have been mainly addressed through modelling and simulation techniques: it is believed that this is a very effective tool for the design of new robotic architectures and their management. In particular, it is believed that an accurate modelling of the robotic structure (and above all of its dynamics) is indispensable for the design of complex structures such as robots, and to which severe performance in terms of speed and accuracy is required. The simulation links with CAD (ProEngineer and ProMechanica) techniques on the one hand and with the tools for the design and operation of the plant on the other, are evident. Flexible mechanization and industrial automation research activities have been focused on the development of simulation programs for the design of manufacturing departments with distributed intelligent control centers and the analysis, implementation, testing and evaluation of planning and scheduling systems for environmental resources of smart factories. Research products have been developed as hybrid systems in Fortran, C, Modsim, Ops5, Nexpert, Simulink, G2. The peculiar contribution in this sector is a deepening of the mechanical systems in the studio that allows the definition of models with a high level of detail, very useful for the development of control systems, governance, diagnosis and supervision. On the basis of these models it was possible to study analogue-digital control feedbacks for the lower levels and to define the logic and strategies of governance for higher decision-making levels using techniques of artificial intelligence. The contribution in this area is peculiar to the original approach of the integrated methodological-control project which is based, where available, on physical principles, using heuristic criteria for the cooperating decision-making nuclei, where it is not possible or convenient. use optimization techniques.
Main research topics: smart instrumental robot design, kinematic and dynamic modelling and simulation; intelligent manipulation and soft grasping; surgical robots, climbing robots, extreme robotics; intelligent flexible manufacturing.

Author or co-author of some 250 publications in the area of robotics and manufacturing systems.
Referee of several international journals on robotics and industrial automation
Chair and co-Chair of international conferences on Robotics and Intelligent manufacturing

DIDACTIC
Teacher at Master coueses sudh as: Dinamica e controllo dei sistemi meccanici, Service robotics,
Tutor of more than fifty PhD and degree theses on Flexible automation, Robotics and intelligent Manufacturing
Coordinator of the round table on Education in Robotics within ISR 2009 Barcelona
Co-coordinator of the Summer School on Robotic and Biologically-Inspired Manipulation ;
EURON Summer School on Visual Servoing, Benicassim (2011)
Promoter of the international summer school Screw-Theory Based Methods in Robotics August 22-30, 2009, University of Genoa, Italy, repeated in different venues annually
Supporter, invited contributor to High-tech Skills for Europe
Promoter, scientific responsible, organizer and teacher of International Master in Robotics **IMrob** (2006) at UNIGE

Editor, general chair of the international conference IMG04, Intelligent Manipulation and Grasping, ISSN: 0143-991x, Industrial Robot Article publication date: 1 February 2005Emerald Group Publishing Limited

Promoter and Co-organizer with IIS (Italian Institute of Welding) and IIW (International Institute of welding) of the international course IMORW in Mechanized, Orbital and Robot welding - Comprehensive level for the editions in 2018, 2019, 2020.

Contribution to NATO NIAG Study SG-252 on Emerging and Disruptive Technologies (EDT) with lecture notes on Biotechnology and Human Enhancement (BHET) in 2020

Guest Editor of the Collection "Sensors and Robotics" and "Sensors and Robot Control" of Sensors MDPI journal in 2021, 2022.

INSTITUTIONAL ROLES:

President of SIRI (Italian Association of Robotics and Automation) from 2000 to 2016; then Vice President

President of IIS (Italian Institute of Welding) from 2013 to 2016, then Past-President as far as 2020

National Coordinator at IFR (International Federation of Robotics) from 2000 and From 2020 member of the Robotic Service Group @ IFR.

Founder member of the Italian association of Artificial Intelligence AIIA.

Expert, appointed by European Commission, of Advisory Group for Horizon 2020 LEIT-NMBP (Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, and Biotechnology);

Expert evaluator of European Commission (ICT, ERC, NMP, ESF, FWO, FET Open);

Member of ESF (European Science Foundation) Community of Experts;

Expert nominated by Italian Ministry of Economic Development and Ministry of Education.

Member of EURON European Robotics Research Network

Member of CLAWAR Climbing and Walking Robots association

Member of ManuFUTURE Biointelligent Manufacturing (2019-2022)

Appointed by the rector Prof. Paolo Comanducci in 2019 to maintain relations and take care of the reciprocal visits of the University of Genoa with the Ugandan university delegations

Contact person for the SIRI of the framework agreement DIBRIS-SIRI

Referent of SIRI for contacts and collaboration with RAISE (Robotics and AI for Socio-economic Empowerment) that the University of Genoa, IIT and CNR are developing in the PNRR field, in consideration of the strong elements of synergy with their own institutional purposes.

Expert in evaluation committees of competitions for professors and PhD nominated by different Universities; e.g.
- KTH Royal Institute of Technology in Stockholm,
- Jaume I University, Castellón de la Plana,
- Arts et Métiers ParisTech École Nationale Supérieure d'Arts et Métiers ParisTech (ENSAM)
- NTU Nanyang Technological University, Singapore

Member of PhD theses international Committees and referee of thesis awards in robotics and smart manufacturing

Expert evaluator of national research projects appointed by Universities and Research Institutes: e.g.
- Polish Minister of Science and Higher Education;
- Spanish National Research Council Action Plan,
- Shanghai Jiao Tong University academic program;
- Foresight Agency (ANEP)

Visiting professor at:
o MIT MECHE, Boston (2015),
o Prof. Shigeo Hirose, Tokyo Institute of Technology. (2012)
o Prof. Toshiyuki Murakami, Keio Univrsity, (2012)
o Prof. Mary J. N. Okwakol, Busitema University, (2016)
o Prof. John Ssebuwufu, Kyambogo University, (2016) .
o Prof. Christne Dranzoa, Muni University, (2016) .
o Prof. Feng Gao, Shanghai Jao Tong University, (2006)

Invited keynote speaker in international conferences: e.g.

ACIRS 2022 7th Asia-Pacific Conference on Intelligent Robot Systems, Tianjin, Keynote speech "From mobile robots to smart vehicles"

WRC World Robot Conferences Beijng 2022) invited kayspeech at the Main Forum "current state and trends of robotics development in Europe

WRC World Robot Conferences Beijng 2021) invited by MIIT (Ministry of Industry and Information) e CAST (China Association for Science and Technology),)," Smart grippers design and development"

ACIRS 2021, 6th Asia-Pacific Conference on Intelligent Robot Systems Tokyo, Keynote speech "Robotics technology and application trends 2021"

ROBOTICS 2020 2nd International Robotics & Automation Engineering Conference, Virtual, Keynote presentation "Smart grippers design and development "

WRC World Robot Conferences Beijng 2019) invited by MIIT (Ministry of Industry and Information) e CAST (China Association for Science and Technology), Beijing, Keynote speech "Development and Application of Robots in Europe"

NovelFarm, Verona (2019) "Robotic technologies for protected agriculture: greenhouses use case",

WRC World Robot Conferences Beijng 2018, invited by MIIT (Ministry of Industry and Information) e CAST (China Association for Science and Technology), Beijing, Keynote speech " Implications of Horizon 2020 (2018-2020) for Robotic Industry"

Int. Conf. on Robotics and Smart Manufacturng (RoSMa2018), IIITDM Kancheepuram, Chennai, INDIA

WRC World Robot Conferences Beijng 2017, invited by MIIT (Ministry of Industry and Information) e CAST (China Association for Science and Technology), Beijing, Keynote speech "Robotics Technology and Industry Trends in European Union"

EMARO Days 2018, Nantes, "Robotics: Research topics, Technologies, Market trends"

WRC World Robot Conferences Beijng 2015, invited by MIIT (Ministry of Industry and Information) e CAST (China Association for Science and Technology)," Keynote Speech: Italian Robotics HORIZON 2020 perspectives, research and innovation to strengthen industry development"

Int. Conf. on Mechanisms and Machine Science (CCMMS 2010), Beijing

EURON, RoboBusiness Europe, London, Keynote speech "Robotic Surgery – Recent Success and Future Direction",

Schunk International Expert Days – Service Robotics (2010), Brackenheim-Hausen, Keynote speech "Robotic handling of limp, soft, near 2D material ",

Research projects
She has participated in national and international research projects on topics of robotics and industrial automation with different roles such as:

EU coordinator (coord), UNIGE responsible (resp), researcher (res); contributions in euro to UNIGE are displayed :

PRI DE(coord, PRI N2000, 62.000€), E-RACE, MiniPKM (coord, PRI N 2003, 73.000€), Studio di fattibilità per un veicolo trainato automatico per ispezione di condotte sommerse (coord PSTL Liguria 2006 45.000€)

Note-Snail (coord), SmartReflex(resp, FI RB Smart FLEX. MI UR (2008, 110.000€), FlexProd (resp. I ndustria 2015 MS01_00016, 108.569€) ,

Roboclimber (resp, G1ST-CT-2002, 266115€), MICRODRAINAGE (res. EVK4-CT-2002, 228.778€), SBC (resp, G1RD-CT-2000, 141.985€), Smartwire(resp, G1ST-CT-2002, 157.090€), EUROShoE (resp. G1RD-CT-2000, 246.045€) , SAFERDRI LL (resp. CR 16842, 224.400€) , LEAPFROG CA(resp, NMP2-CT-2004, 29.000€) , LEAPFROG-IP (resp, 786.679€) , SwarmI tFI X (coord. FP7 NMP, 749.550€), PI CAV (PI , coord. FP7 Transport, 594360€)), FURBOT (resp. FP7 Transport, 578.640€), AUTORECON(resp FP7 NMP, 328.400€) , CloPeMa(res. FP7 I CT, 601.800€), , TIRAMI SU(res. FP7 Security 518.080€), COLLABORATE (res. H2020 NMBP 2018, 471.875€), SHOW (res. H2020-EU.3.4. - SOCIETAL CHALLENGES - Smart, Green And Integrated Transport ID: 875530, 316.562,50€)

Genova, 19/07/2022