

## PERSONAL INFORMATION

Name **MARCO CARRICATO**  
Address DEPARTMENT OF INDUSTRIAL ENGINEERING, UNIVERSITY OF BOLOGNA,  
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## WORK EXPERIENCE

- Dates (from – to) 09.12.2019 to date
  - Employer University of Bologna, Viale Risorgimento 2, 40136 Bologna (BO), Italy
  - Sector Education and Research
  - Position held **Full Professor**
- Main activities and responsibilities Research in the fields of **Robotics, Mechanism Theory** and **Industrial Automation**.  
Teaching in the fields of **Mechanics of Machines, Mechanics of Robots** and **Mechanics of Drives**.  
Head of the **IRMA L@B - Industrial Robotics, Mechatronics & Automation Lab @ Bologna**, within the Dept. of Industrial Engineering.
- Main research interests Servo-actuated automatic machinery, Cable-driven parallel robots, Analysis and synthesis of parallel robots, Robot kinematics, Screw Theory, Collaborative robotics, Homokinetic transmissions.
- Dates (from – to) 15.09.2014 to 08.12.2019
  - Employer University of Bologna, Viale Risorgimento 2, 40136 Bologna (BO), Italy
  - Sector Education and Research
  - Position held Associate Professor
- Main activities and responsibilities Research in the fields of **Robotics, Mechanism Theory** and **Industrial Automation**.  
Teaching in the fields of **Mechanics of Machines, Mechanics of Robots** and **Mechanics of Drives**.
- Dates (from – to) 01.01.2004 to 14.09.2014
  - Employer University of Bologna, Viale Risorgimento 2, 40136 Bologna (BO), Italy
  - Sector Education and Research
  - Position held Assistant Professor
- Main activities and responsibilities Research and teaching in the fields of **Mechanics of Machines, Robotics**, and **Industrial Automation**.

## QUALIFICATIONS

- Dates (from – to) 06.02.2014 to date
- Organisation providing the qualification Italian Ministry of Education, Universities and Research (MIUR)
- Title of qualification awarded National Scientific Qualification (ASN) for the roles of Associate Professor and Full Professor, in the field of Mechanics of Machines.
- Dates (from – to) June 2009
- Organisation providing the qualification French National Institute for Research in Computer Science and Control (INRIA)
- Title of qualification awarded Qualified first in the competitive selection for a position of "Chargé de recherche de première classe - CR1" at INRIA - Sophia Antipolis (France).
- Dates (from – to) December 1998

- Organisation providing the qualification University of Bologna
- Title of qualification awarded Professional Engineer Certificate.
  - Dates (from – to) 01.05.2018 to date
  - Organisation providing the qualification Cambridge Assessment English
- Title of qualification awarded Grade A (CEFR Level C2) Certificate in Advanced English

## EDUCATION AND TRAINING

- Dates (from – to) 01.01.1999-31.12.2001
  - Institution University of Bologna
- Title of qualification awarded Ph.D. in Mechanics of Machines;  
Dissertation: "Singularity-Free Fully-Isotropic Translational Parallel Manipulators".  
Ph.D.
- Level in national classification
  - Dates (from – to) 01.10.1992-15.07.1998
  - Institution University of Bologna
- Title of qualification awarded Degree in Mechanical Engineering, with Honours;  
Dissertation: "Theoretical Contribution for the Static Analysis of Compliant Mechanisms" (in Italian).
- Level in national classification 1<sup>st</sup> Level Degree (Bachelor equivalent) + 2<sup>nd</sup> Level Degree (Master equivalent)
- Dates (from – to) 15.09.1987-18.07.1992
  - Institution Scientific High School of Rende (CS)
- Title of qualification awarded Scientific Diploma, with Honours.
- Level in national classification Secondary School

## TEACHING ACTIVITY

### INSTITUTIONAL TEACHING

- 22.02.2016 to date: instructor in charge of the course Mechanics of Machines for the Second-Cycle (Master) Degree in Mechanical Engineering;
- 01.11.2008 to date: instructor in charge of the course Mechanics of Drives for the First-Cycle (Bachelor) Degree in Mechanical Engineering;
- 21.02.2019 to 15.09.2023: instructor in charge of the course Laboratory of Robotics and Mechatronics for the Second-Cycle (Master) Degree in Mechanical Engineering;
- 21.09.2020 to 14.09.2022: instructor in charge of the course Fundamentals of Mechanics of Machines for the Second-Cycle (Master) Degree in Automation Engineering;
- 21.09.2020 to 17.09.2021: instructor in charge of the course Mechanical Drives for the First-Cycle (Bachelor) Degree in Mechatronics;
- 01.05.2005-31.07.2009: instructor in charge of the courses of Mechanics of Machines and Mechanics of Drives for the First-Cycle (Bachelor) Degree in Food Industry Engineering and Chemical Engineering;
- 01.01.1999 to 31.10.2008: assistant instructor for the courses Mechanics of Machines, Mechanics of Drives and Mechanics of Robots for the First-Cycle (Bachelor) and Second-Cycle (Master) Degrees in Mechanical Engineering;

### STUDENT SUPERVISION

- 2011 to date: Supervision of 15 PhD Theses: G. Abbasnejad (2014), A. Berti (2015), F. Meoni (2017), G. Mottola (2019), E. Idà (2021), V. Mattioni (2023) P. Ridolfi (2023), S. Comari (2023), R. Di Leva (2023), F. Zaccaria (2023), L. Guagliumi (ongoing), S. Gabaldo (ongoing), M. Angelini (ongoing), G. Sciarra (ongoing), A. De Toni (ongoing); Co-supervision of 2 PhD Theses: V. Di Paola (University of Genoa - Ecole Centrale de Nantes, 2023), G. Innero (Chinese University of Hong Kong, ongoing).
- 2007 to date: Supervision of 88 Bachelor Theses and 126 Master Theses.

### INTERNATIONAL LECTURING

- 03.05.2024: Keynote lecture "Persistent manifolds of the Special Euclidean Group SE(3)" at the Workshop "Kinematic Aspects of Robotics" within the Special Semester on Rigidity and

Flexibility, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Linz, Austria

- 18.09.2023-22.09.2023: Lecturer of the 4th Summer School on Singularities of Mechanisms and Robotic Manipulators (Simero 2023), Ecole Centrale de Nantes, Nantes, France.
- 18.06.2023-24.06.2023: Lecturer of the 9th Int. Summer School on Screw-Theory Based Methods in Robotics (Summer Screws 2023), Delft University of Technology, Delft, The Netherlands.
- 08.06.2023: Keynote lecture "Mobile collaborative robots for flexible manufacturing and logistics" at the 1<sup>st</sup> French-Italian Workshop on Robotics 4.0 for Factories of the Future, Paris, France.
- 27.05.2022: Keynote lecture "Underactuated Cable-Driven Parallel Robots: opportunities and challenges" at the ICRA 2022 Workshop: "New frontiers of parallel robotics (2<sup>nd</sup> Edition)", 2022 IEEE Int. Conference on Robotics and Automation, Philadelphia, USA.
- 17.11.2021: Keynote lecture "Underactuated Cable-Driven Parallel Robots: Theoretical and Practical Challenges" at the ICROM 2021 Workshop: "Parallel and Cable Robots: Learning from Past for Future Frontiers", 9th RSI (Robotics Society of Iran) International Conference on Robotics and Mechatronics, virtual event.
- 07.02.2020: Seminar "Persistent manifolds of the Special Euclidean Group SE(3)" at the University of Twente, Enschede, The Netherlands.
- 07.06.2019: Keynote lecture "Persistent manifolds of the Special Euclidean Group SE(3)" at the Conference on Geometry: Theory and Applications (CGTA 2019), University of Innsbruck, Innsbruck, Austria.
- 07.02.2019: Seminar "Screw theory and its applications in robotics" at the Italian Institute of Technology, Genoa, Italy.
- 17.09.2018-21.09.2018: Lecturer of the 2nd Summer School on Parallel Kinematic Manipulators (PKM 2018), LIRMM (Université de Montpellier - CNRS), Montpellier, France.
- 02.12.2017-10.12.2017: Lecturer of the 8th Int. Summer School on Screw-Theory Based Methods in Robotics (Summer Screws 2017), Monash University, Melbourne, Australia.
- 09.07.2017: Keynote lecture "Screw theory and its applications in robotics" at the IFAC 2017 Workshop: "Rigidity theory for multi-agent systems meets parallel robots: towards the discovery of common models and methods", 20th World Congress of the International Federation of Automatic Control, Toulouse, France.
- 16.05.2016: Keynote lecture "Screw theory and its applications" at the ICRA 2016 Workshop: "Application of the theoretical background in Parallel Robotics to other research areas", 2016 IEEE Int. Conference on Robotics and Automation, Stockholm, Sweden.
- 12.07.2015-20.07.2015: Lecturer of the 6th Int. Summer School on Screw-Theory Based Methods in Robotics (Summer Screws 2015), Beihang University, Beijing, China.
- 03.09.2014-11.09.2014: Lecturer of the 5th Int. Summer School on Screw-Theory Based Methods in Robotics (Summer Screws 2014), University of Bologna, Bologna, Italy.
- 14.06.2012: Lecturer of the 2011 National Course on Industrial Automation and Robotics (organized by the Italian Association of Robotics and Automation), University of Bologna, Italy.

## ACADEMIC SERVICE

### INTERNATIONAL FELLOWSHIPS

- 22.06.2013-15.07.2013: visiting researcher at the Hong Kong University of Science & Technology (Hong Kong, China); inviting professor: Prof. Zexiang Li.
- 02.04.2013-03.05.2013: visiting researcher at the École Centrale of Nantes (Nantes, France); inviting researchers: Dr. Philippe Wenger and Dr. Stéphane Caro.
- 27.04.2009-28.08.2009: visiting researcher at INRIA – French National Institute for Research in Computer Science and Control (Sophia Antipolis, France); inviting researcher: Dr. Jean-Pierre Merlet.
- 22.01.2008-10.06.2008: visiting researcher at the Department of Mechanical Engineering of the Guanajuato University (Salamanca, Mexico); inviting professor: Prof. José María Rico Martínez.
- 20.03.2007-28.08.2007: visiting researcher at the Laval University Robotics Laboratory (Quebec City, Canada); inviting professor: Prof. Clément Gosselin.
- 01.01.1998-30.06.1998: visiting researcher at the Center for Intelligent Machines and Robotics of the University of Florida (Gainesville, USA); inviting professor: Prof. Joseph

Duffy.

## AWARDS

- 2021 IEEE I-RAS Young Author Best Paper Award: awarded by the Italian Chapter of IEEE Robotics & Automation Society to the paper "Rest-to-rest trajectory planning for underactuated cable-driven parallel robots", by E. Idà, T. Bruckmann and M. Carricato, published on *IEEE Transactions on Robotics*, 35(6), 2019.
- 2021 CABLECON Best Research Paper Award: awarded to the paper "A New Performance Index for Underactuated Cable-Driven Parallel Robots", by E. Idà and M. Carricato, presented at the 5th International Conference on Cable-Driven Parallel Robots (CABLECON 2021).
- 2020 I-RIM Best Paper Award Finalist: the paper "Cable-Driven Parallel Robots, Theoretical Challenges and Industrial Applications", by E. Idà and M. Carricato, was selected as a finalist for the best paper award in the category "Mechanical design of robotic systems" at the 2<sup>nd</sup> Italian Conference of Robotics and Intelligent Machines (I-RIM 3D 2020).
- 2020 ROMANSY Best Research Paper Award Finalist: the paper "An Analytical Formulation for the Geometrico-static Problem of Continuum Planar Parallel Robots", by F. Zaccaria, S. Briot, M. T. Chikhaoui, E. Idà and M. Carricato, was selected as a finalist for the best research paper award at the 23<sup>rd</sup> CISM IFToMM Symposium on Robot Design, Dynamics and Control 2020 (ROMANSY 2020).
- 2020 IFIT Gold Best Student Paper Award: awarded to the paper "Position Analysis of a Class of n-RRR Planar Parallel Robots", by T. Marchi, G. Mottola, J. M. Porta Pleite, F. Thomas and M. Carricato, presented at the 3<sup>rd</sup> Int. Conference of IFToMM Italy (IFIT 2020).
- 2019 IEEE-CYBER Best Student Paper Award: awarded to the paper "Effect of Actuation Errors on a Purely-Translational Spatial Cable-Driven Parallel Robot", by G. Mottola, C. Gosselin, and M. Carricato, presented at the 9th IEEE Int. Conference on CYBER Technology in Automation, Control, and Intelligent Systems (IEEE-CYBER 2019).
- 2018 JMD "Reviewer with Distinction" Award: awarded by the ASME Journal of Mechanical Design to reviewers who made a meritorious contribution to the journal in terms of the number, quality, and turnaround time of reviews.
- 2018 MEDER Bronze Best Research Paper Award: awarded to the paper "Unified Pose Parametrization for 1T2R Parallel Manipulators", by Y. Wu and M. Carricato, presented at the 4th IFToMM Symposium on Mechanism Design for Robotics (MEDER 2018).
- Elevation to the grade of IEEE Senior Member since July 2018.
- 2012 TRO "Reviewer with distinction" Award: recognition awarded by the IEEE Transactions on Robotics to reviewers who provided outstanding and timely reviews.
- 2011 AIMETA Junior Prize: awarded by the Italian Association of Theoretical and Applied Mechanics for outstanding research results, as a young scientist, in the field of Mechanics of Machines.
- 2011 IEEE I-RAS Young Author Best Paper Award: awarded by the Italian Chapter of IEEE Robotics & Automation Society to the paper "A New Assessment of Singularities of Parallel Kinematic Chains", by M. Conconi and M. Carricato, published on *IEEE Transactions on Robotics*, 25(4), 2009.
- 2007 IFToMM Young Delegate Grant: awarded by the International Federation for the Promotion of Mechanism and Machine Science (IFToMM) to support the participation at the IFToMM World Congress, 17-21 June 2007, Besançon, France.
- 2002-2003 Masi-Carducci Prize: biennial scholarship awarded by the Dept. of Mechanical, Nuclear, Aviation and Metallurgical Engineering of the University of Bologna to distinguished young researchers in the field of Mechanics of Machines.
- 1992 Soroptimist National Award: awarded by Soroptimist International of Italy for being among the best 118 Italian high-school graduates.

## JOURNAL AND CONFERENCE SERVICE

- 05.04.2012 to date: Associate Editor of the Journal *Mechanism and Machine Theory*.
- 01.01.2021 to date: Editorial Board of the *Chinese Journal of Mechanical Engineering (CJME)*.
- 30.06.2024-04.07.2024: Scientific Committee of the 19th Int. Symposium on Advances in Robot Kinematics (ARK 2024), Ljubljana, Slovenia.
- 26.06.2024-28.06.2024: Scientific Committee of the MMT Symposium – Celebrating 60 years since the foundation of the Mechanism and Machine Theory journal, Guimarães, Portugal.
- 13.05.2024-17.05.2024: Associate Editor of the 2024 IEEE Int. Conference on Robotics and

- Automation (ICRA 2024), Yokohama, Japan.
- 25.06.2023-28.06.2023: Scientific Committee of the 6th Int. Conference on Cable-Driven Parallel Robots (CableCon 2023), Nantes, France.
- 29.05.2023-02.06.2023: Associate Editor of the 2023 IEEE Int. Conference on Robotics and Automation (ICRA 2023), London, UK.
- 27.05.2022: Co-organizer of the IEEE ICRA 2022 Workshop: "New frontiers of parallel robotics (2<sup>nd</sup> Edition)", Philadelphia, USA.
- 26.06.2022-30.06.2022: Scientific Committee of the 18th Int. Symposium on Advances in Robot Kinematics (ARK 2022), Bilbao, Spain.
- 23.05.2022-27.05.2022: Associate Editor of the 2022 IEEE Int. Conference on Robotics and Automation (ICRA 2022), Philadelphia, USA.
- 09.10.2021: Co-organizer of the Workshop "Field and Service Robotics: Towards deployment in highly challenging environments" within the 3rd Italian Conference on Robotics and Intelligent Machines (I-RIM 2021), Rome, Italy.
- 27.09.2021-01.10.2021: Associate Editor of the 2021 IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2021), Prague, Czech Republic.
- 07.07.2021-09.07.2021: Scientific Committee of the 5th Int. Conference on Cable-Driven Parallel Robots (CableCon 2021), virtual conference.
- 30.05.2021: Co-organizer of the IEEE ICRA 2021 Workshop "Parallel robots or not parallel robots? New frontiers of parallel robotics", Xi'an, China.
- 10.12.2020: Co-organizer of the Workshop "Human-robot collaboration: from industrial to service applications" within the 2nd Italian Conference on Robotics and Intelligent Machines (I-RIM 2020), virtual workshop.
- 06.12.2020-10.12.2020: Scientific Committee of the 17th Int. Symposium on Advances in Robot Kinematics (ARK 2020), conference limited to proceedings, due to the covid-19 emergency.
- 25.10.2020-29.10.2020: Associate Editor of the 2020 IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2020), virtual conference.
- 30.06.2019-04.07.2019: Scientific Committee of the 4th Int. Conference on Cable-Driven Parallel Robots (CableCon 2019), Kraków, Poland.
- 03.11.2019-08.11.2019: Associate Editor of the 2019 IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2019), Macau, China.
- 01.07.2018-05.07.2018: Co-organizer of the 16th Int. Symposium on Advances in Robot Kinematics (ARK 2018), Bologna, Italy.
- 22.05.2017-24.05.2017: Scientific Committee of the 7th IFToMM Int. Workshop on Computational Kinematics (CK 2017), Poitiers, France.
- 04.09.2017-07.09.2017: Scientific Committee of the 23rd Congress of the Italian Association of Theoretical and Applied Mechanics (AIMETA 2017), Salerno, Italy.
- 16.05.2016-21.05.2016: Associate Editor of the 2016 IEEE Int. Conference on Robotics and Automation (ICRA 2016), Stockholm, Sweden.
- 28.09.2015-02.10.2015: Associate Editor of the 2015 IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2015), Hamburg, Germany.
- 26.05.2015-30.05.2015: Associate Editor of the 2015 IEEE Int. Conference on Robotics and Automation (ICRA 2015), Seattle, WA, USA.
- 14.09.2014-18.09.2014: Associate Editor of the 2014 IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2014), Chicago, IL, USA.
- 03.09.2014-11.09.2014: Chair and Organizer of the 5th Int. Summer School on Screw-Theory Based Methods in Robotics (Summer Screws 2014), Bologna, Italy.
- 19.03.2014: Co-chair of the European Workshop on Applications of Parallel and Cable-driven Robots, Lyon, France.
- 02.07.2012-04.07.2012: Co-Chair of the Robotics track at the ASME 11th Biennial Conference on Engineering Systems Design and Analysis (ESDA2012).
- Peer-reviewer for: Advanced Robotics; Advances in Mechanical Engineering; ASME J. of Mechanical Design; ASME J. of Mechanism and Robotics; IEEE Access; IEEE Robotics and Automation Letters; IEEE Transactions on Robotics; IEEE/ASME Transactions on Mechatronics; Int. J. of Robotics and Automation; J. of Robotic Systems; J. of Zhejiang University - Science A; Mathematical Physics, Analysis and Geometry; Meccanica; Mechanism and Machine Theory; Mechatronics; Robotica; Robotics and Autonomous Systems; Robotics and Computer Integrated Manufacturing; The Int. J. of Robotics

PUBLIC OUTREACH	Research.
INTERNATIONAL ACADEMIC COMMITTEES AND SERVICE	<ul style="list-style-type: none"> <li>• 14.06.2024: Keynote talk “Robot collaborativi mobili per la produzione e la logistica flessibili”, <i>Fabbrica Futuro – Tecnologie, modelli organizzativi e persone</i>, Bologna, Italy.</li> <li>• 14.06.2024: PdM Talk about Industry 5.0, Talk show promoted by Parole di Management (Management words), <a href="https://www.paroledimangement.it/industria5-0-ultimomiglioperdavvero/">https://www.paroledimangement.it/industria5-0-ultimomiglioperdavvero/</a>; <a href="https://www.youtube.com/watch?v=bm02PtRCNNk">https://www.youtube.com/watch?v=bm02PtRCNNk</a>.</li> <li>• 07.2019 to date: Deputy Chair of the Technical Committee for Computational Kinematics of the Int. Federation for the Promotion of Mechanism and Machine Science (IFTToMM);</li> <li>• 10.2017 to date: Member of the Technical Committee for Robotics and Mechatronics of the Int. Federation for the Promotion of Mechanism and Machine Science (IFTToMM);</li> <li>• 11.2013 to date: Member of the Technical Committee for Computational Kinematics of the Int. Federation for the Promotion of Mechanism and Machine Science (IFTToMM);</li> <li>• 06.2012 to date: Member of the American Society of Mechanical Engineers (ASME);</li> <li>• 03.2010 to date: Member of the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Robotics and Automation Society (RAS); IEEE Senior Member since 07.2018.</li> <li>• 03.1999 to date: Member of the Italian Association of Registered Engineers.</li> <li>• 01.2022: Evaluator of a research team for the French National Institute for Research in Computer Science and Control (INRIA).</li> <li>• 09.2018: Evaluator of research proposal for The Hong Kong Polytechnic University, China</li> <li>• 08.2018: Evaluator of promotion application for Victoria University of Wellington, New Zealand;</li> <li>• 05.2017: Evaluator for the Austrian Science Fund (FWF);</li> <li>• 07.2014: Evaluator for the Spanish National Agency for Evaluation and Foresight (ANEP);</li> <li>• 06.2015: Award Committee of the AIMETA (Italian Association of Theoretical and Applied Mechanics) Junior Prize 2015;</li> <li>• 15.12.2022: Jury for Doctoral Thesis Evaluation at the École Centrale of Nantes (Nantes, France) and the University of Genoa;</li> <li>• 04.08.2022: Jury for Doctoral Thesis Evaluation at the Chinese University of Hong Kong (Hong Kong, China);</li> <li>• 17.06.2022: Jury for Doctoral Thesis Evaluation at the École Centrale of Nantes (Nantes, France) and the University of Guanajuato (Guanajuato, Mexico);</li> <li>• 25.08.2020: Jury for Doctoral Thesis Evaluation at the Universidade Federal de Santa Catarina (Florianópolis, Brasil);</li> <li>• 07.02.2020: Jury for Doctoral Thesis Evaluation at the University of Twente (Enschede, The Netherlands);</li> <li>• 17.12.2019: Jury for Doctoral Thesis Evaluation at the École Centrale of Nantes (Nantes, France);</li> <li>• 10.08.2017: Jury for Doctoral Thesis Evaluation at Laval University (Quebec City, Canada);</li> <li>• 19.09.2016: Jury for Doctoral Thesis Evaluation at the École Centrale of Nantes (Nantes, France);</li> <li>• 13.05.2015: Jury for Doctoral Thesis Evaluation at INRIA (Sophia Antipolis, France);</li> <li>• 08.12.2011: Jury for Doctoral Thesis Evaluation at the École Centrale of Nantes (Nantes, France);</li> <li>• 28.09.2010: Jury for Doctoral Thesis Evaluation at INRIA (Sophia Antipolis, France);</li> <li>• 25.02.2009: Jury for Doctoral Thesis Evaluation at Laval University (Quebec City, Canada).</li> </ul>
NATIONAL INSTITUTIONAL SERVICE	<ul style="list-style-type: none"> <li>• 05.05.2024 to date: Quality Committee of the University of Bologna.</li> <li>• 01.11.2021 to date: Rector Delegate for the PhD Programs of the University of Bologna.</li> <li>• 09.07.2021-31.12.2023: Member of the national committee for the assignment of the National Scientific Qualification (ASN) for the roles of Associate and Full Professor, in the field of Mechanics of Machines;</li> <li>• 05.12.2018 to date: Junta of the Interdepartmental Center for Industrial Research on Advanced Applications in Mechanical Engineering and Materials Technology, University of Bologna;</li> <li>• 23.02.2018--04.05.2022: Coordinator of the Ph.D. Degree in Mechanics and Advanced Engineering Sciences, University of Bologna;</li> </ul>

- 19.07.2017-23.02.2018: Deputy Coordinator of the Ph.D. Degree in Mechanics and Advanced Engineering Sciences, University of Bologna;
- 28.06.2007 to date: Professor Board of the Ph.D. Degree in Mechanics and Advanced Engineering Sciences, University of Bologna;
- 16.06.2004-24.02.2010: Professor Board of the Ph.D. Degree in Mechanics of Machines, University of Bologna;
- 03.05.2015-15.05.2018: Delegate for International Relations of the Department of Industrial Engineering, University of Bologna.
- 24.11.2010-15.10.2012: Committee for Faculty-Staff Recruiting of the Faculty of Engineering, University of Bologna;
- 06.07.2005-20.07.2012: Junta of the Department of Mechanical, Nuclear, Aviation and Metallurgical Engineering, University of Bologna;
- 05.05.2017: Jury for Doctoral Thesis evaluation at the University of Bologna.
- 14.04.2015: Jury for Doctoral Thesis evaluation at the University of Genoa.
- 22.04.2015: Jury for Doctoral Thesis evaluation at the University of Bologna.
- 15.04.2014: Jury for Doctoral Thesis evaluation at the University of Bologna.
- 29.08, 05.09, 11.09 and 13.09.2023: Committee for appointment of a fixed-term senior research fellow (RTD-B) in Mechanics of Machines at the University of Padua, Italy.
- 17.06.2022: Committee for appointment of an Associate Professor in Mechanics of Machines at the University of Bologna, Italy.
- 01.06 and 13.06.2022: Committee for appointment of an Associate Professor in Mechanics of Machines at the University of Modena and Reggio-Emilia, Italy.
- 18.03 and 15.04.2022: Committee for appointment of a fixed-term senior research fellow (RTD-B) in Mechanics of Machines at the University of Genoa, Italy.
- 24.06, 06.07 and 15.07.2021: Committee for appointment of a Full Professor in Mechanics of Machines at the University of Padua, Italy.
- 18.02 and 10.03.2021: Committee for appointment of a fixed-term senior research fellow (RTD-B) in Mechanics of Machines at the University of Brescia, Italy.
- 02.11 and 18.11.2020: Committee for appointment of an Associate Professor in Mechanics of Machines at the University of Padua, Italy
- 31.07 and 27.08.2020: Committee for appointment of a fixed-term junior research fellow (RTD-A) in Mechanics of Machines at the University of Modena and Reggio Emilia, Italy.
- 18.04.2019: Committee for evaluation of a fixed-term junior research fellow (RTD-A) in Mechanics of Machines at the Scuola Superiore Sant'Anna, Italy.
- 21-22.10.2008: Committee for appointment of an Assistant Professor in Mechanics of Machines at the University of Ancona, Italy.

## RESEARCH

### COORDINATION OF RESEARCH LABORATORIES & TEAMS

- 2023 to date: Scientific Coordinator of the IMA-University of Bologna Joint Research Lab on Mechatronics, Robotics and Artificial intelligence.
- 2020 to date: Founder and Head of the IRMA L@B - Industrial Robotics, Mechatronics & Automation Lab @ Bologna, within the Dept. of Industrial Engineering of the University of Bologna (<https://irmalab.org/>).
- 2014 to 2019: Coordinator of a research unit within the Group of Robotics, Automation and Articular Biomechanics (GRAB), within the Dept. of Industrial Engineering of the University of Bologna (<http://grab.diem.unibo.it/>).

### COORDINATION OF RESEARCH & INDUSTRIAL PROJECTS

- 2024 to date: Robotic handling and transport of liquids for high-performance industrial applications (Matrix), BI-REX Competence Center Project, Project Coordinator; Grant: €136.000.
- 2024 to date: Mobile multi-robot systems for the manipulation of deformable objects (SiMOD), PR-FESR 2021-2027 Project, Coordination of a team within the local unit; Managed grant: €80.000.
- 2023 to date: Multi-robot cooperative manipulation in dynamic applications, in collaboration with IMA, Project Coordinator; Grant: €77.000.
- 2023 to date: Advanced human-machine interaction for continuous transformative

- manufacturing and robotic systems (PNRR PE 11 Made in Italy Circolare e Sostenibile - Spoke 1 project), Research team coordinator within a Local Unit, Grant: €117.000.
- 2023: Innovation of Teaching Laboratories: Real-time control of industrial devices, Strategic Development Projects of the Dept. of Industrial Engineering, Project Coordinator; Grant: €13.700.
  - 2023 to date: Evaluation of the accelerations of goods during road transport in order to optimize packaging and decrease the ecological impact, in collaboration with ROBOPAC, Project Coordinator; Grant: €47.000.
  - 2022 to date: Innovative gearboxes for robotic applications, in collaboration with BONFIGLIOLI, Project Coordinator; Grant: €70.000.
  - 2022 to date: Intelligent systems for the innovation of the automatic-machine industry, in collaboration with IMA, Project Coordinator; Grant: €84.500.
  - 2022 to date: Extending robotic manipulation capabilities by cooperative mobile and flexible multi-robot systems (Co-MiR), PRIN2020 Grant No. 2020CMEFPK, Research team coordinator within a Local Unit, Grant: €70.000.
  - 2020 to date: Robotic devices for vision-assisted pick&place operations for high-performance automatic-machinery feeding, in collaboration with MARCHESINI, Project Coordinator; Grant: €150.000.
  - 2016-2022 to date: Robotized production cells, in collaboration with IMA, Project Coordinator; Grant: €425.000.
  - 2022: Unconventional collaborative robotics (Ucobotics), University of Bologna Call for Spin-off Projects 2020, Project Coordinator; Grant: €12.000.
  - 2021-2022: Electro-mechanical actuation systems for marine applications, in collaboration with CALZONI, Project coordinator; Grant: €38.000.
  - 2021-2022: Cable-driven parallel robot for automated lifting of moving loads in marine applications, in collaboration with CALZONI, Project coordinator; Grant: €76.000.
  - 2020-2022: Collaborative robotics for advanced, interconnected and flexible manufacturing systems (FlexCoBot), BI-REX Competence Center Project, Project Coordinator; Grant: €120.000.
  - 2019-2021: Collaboration between operators and safe mobile robotic manipulators for the factory of the future (COORSA), POR-FESR 2014-2020 Project, Coordination of a team within the local unit; Managed grant: €58.000.
  - 2017-2021: Design and simulation of powertrains of traditional and hybrid electric vehicles, in collaboration with LAMBORGHINI, Project Coordinator; Grant: €150.000.
  - 2019-2020: Robotic solutions for 3D printing, in collaboration with MARK ONE, Project Coordinator; Grant: €33.000.
  - 2019: Analysis, design and validation of compact gearboxes with low transmission ratios and limited backlash, in collaboration with SAMP INGRANAGGI, Project Coordinator; Grant: €40.000.
  - 2018-2020: Optimization of mechanisms for automatic machinery, in collaboration with CEVOLANI, Project Coordinator; Grant: €71.000.
  - 2018: Training in the field of Mechanics of Machines, in collaboration with G.D, Project Coordinator; Grant: €7.500.
  - 2018: Serial and closed-chain gripping and manipulation systems, in collaboration with IMA, "High skills for research and technology transfer" Emilia-Romagna Regional Project; Grant: €31.000.
  - 2017: Training in the field of Mechanics of Machines, in collaboration with GIMA, Project Coordinator; Grant: €8.000.
  - 2017: MIUR FFABR Grant (Finanziamento delle attività base di ricerca); Grant: €3.000.
  - 2017: Design of innovative mechanisms for automatic machinery for sterile environments, in collaboration with ECOR RESEARCH, Project Coordinator; Grant: €10.000.
  - 2017: Cable-driven parallel devices for 3D laser scan systems, in collaboration with GREEN LINE, Project Coordinator; Grant: €33.000.
  - 2017: Design and simulation of hydraulic actuation systems, in collaboration with NEXT HYDRAULICS, Project Coordinator; Grant: €35.000.
  - 2016-2108: Integrated solutions for next-generation automatic machines (SINERGIE), POR-FESR 2014-2020 Project, Coordination of a team within the local unit; Grant: €89.000.



- 2015-2018: Electro-mechanical actuation systems for marine applications, in collaboration with CALZONI, Project coordinator; Grant: €85.000.
- 2014-2017: Intelligent cable-driven robots (ICABOT): an adaptive approach to robot design and control; PRIN2012 Grant No. 20124SMZ88, Local Coordinator; Grant: €73.000.
- 2014: Optimization of mechanisms for automatic machinery, Project Coordinator, in collaboration with CEVOLANI; Grant: €32.500
- 2013-2016: Energy efficiency and mechanism optimization in servo-actuated automatic machinery, in collaboration with GIMA TT, Project Coordinator; Grant: €90.000.
- 2013-2015: Robotic solutions for flexible and modular automatic machinery, in collaboration with GIMA, Project Coordinator; Grant: €133.000.
- 2015: Electromechanical actuation systems for domestic appliances, Project Coordinator, in collaboration with NUOVA STAR; Grant: €42.000.
- 2014: Strain analysis of automatic-machine components, in collaboration with G.D, Project Coordinator; Grant: €3.100.
- 2013-2014: Training in the field of Mechanics of Machines, in collaboration with TETRA PAK, Project Coordinator; Grant: €60.000.
- 2013: Analytical models of hydraulic couplings for motorbike applications, in collaboration with PIAGGIO, Project Coordinator; Grant: €6.500.
- 2012-2014: Competitiveness in plastic deformation, INDUSTRY 2015 Project (New Technologies for Made-in-Italy Goods): national coordinator of the research line "New machine architectures" and local coordinator of the Demonstrator "Energy-efficient servo-assisted sheet-metal forming press" (scientific coordination of research activity was in this case disjoint from budget responsibility).

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- [1] Gabaldo, S., Idà, E., and Carricato, M. 2024. Pose-estimation methods for underactuated cable-driven parallel robots. *Mechanism and Machine Theory*, 199, paper no. 105690, pp. 1-13.
- [2] Guagliumi, L., Berti, A., Monti, E., Fabritius, M., Martin, C., and Carricato, M. 2024. Force-sensor-free implementation of a hybrid position–force control for overconstrained cable-driven parallel robots. *Robotics*, 13(2), Paper No. 25, pp. 1-21.
- [3] Idà, E., and Carricato, M. 2024. Static workspace computation for underactuated cable-driven parallel robots. *Mechanism and Machine Theory*, 193, paper no. 105551, pp. 1-19.
- [4] Baldassarri, A., Bertelli, M., and Carricato, M. 2023. Design of a reconfigurable mobile collaborative manipulator for industrial applications. *ASME Journal of Computational and Nonlinear Dynamics*, 18(9), Paper No. 091006, pp. 1-8.
- [5] Di Leva, R., Carricato, M., Gattringer, H., and Müller, A. 2022. Sloshing dynamics estimation for liquid-filled containers performing 3-dimensional motions: modeling and experimental validation. *Multibody System Dynamics*, 56(2), pp. 153-171.
- [6] Zaccaria, F., Quarta, E., Badini, S., and Carricato, M. 2022. Optimal design for vibration mitigation of a planar parallel mechanism for a fast automatic machine. *Machines*, 10(9), Paper No. 770, pp. 1-12.
- [7] Comari, S., and Carricato, M. 2022. Vision-based robotic grasping of reels for automatic packaging machines. *Applied Sciences*, 12(15), Paper No. 7835, pp. 1-18.
- [8] Comari, S., Di Leva, R., Carricato, M., Badini, S., Carapia, A., Collepalambo, G., Gentili, A., Mazzotti, C., Staglianò, K., and Rea, D. 2022. Mobile cobots for autonomous raw-material feeding of automatic packaging machines. *Journal of Manufacturing Systems*, 64, pp. 211-224.
- [9] Mattioni, V., Idà, E., and Carricato, M. 2022. Force-distribution sensitivity to cable-tension errors in overconstrained cable-driven parallel robots. *Mechanism and Machine Theory*, 175, paper no. 104940, pp. 1-14.
- [10] Guagliumi, L., Berti, A., Monti, E., and Carricato, M. 2022. Antislashing trajectories for high-acceleration motions in automatic machines. *ASME Journal of Dynamic Systems, Measurement, and Control*, 144(7), Paper No. 071006, pp. 1-10.
- [11] Zaccaria, F., Idà, E., Briot, S. and Carricato, M. 2022. Workspace computation of planar continuum parallel robots. *IEEE Robotics and Automation Letters*, 7(2), pp. 2700-2707.
- [12] Idà, E., Briot, S., and Carricato, M. 2022. Identification of the inertial parameters of underactuated cable-driven parallel robots. *Mechanism and Machine Theory*, 167, paper no. 104504, pp. 1-14.
- [13] Mattioni, V., Idà, E. and Carricato, M. 2021. Design of a planar cable-driven parallel robot for non-contact tasks. *Applied Sciences*, 11(20), Paper No. 9491, pp. 1-18.

- [14] Guagliumi, L., Berti, A., Monti, E., and Carricato, M. 2021. A simple model-based method for sloshing estimation in liquid transfer in automatic machines. *IEEE Access*, 9, pp. 129347-129357.
- [15] Zaccaria, F., Baldassarri, A., Palli, G., and Carricato, M. 2021. A mobile robotized system for depalletizing applications: design and experimentation. *IEEE Access*, 9, pp. 96682-96691.
- [16] Aleotti, J., Baldassarri, A., Bonfè, M., Carricato, M., Chiaravalli, D., Di Leva, R., Fantuzzi, C., Farsoni, S., Innero, G., Lodi Rizzini, D., Melchiorri, C., Monica, R., Palli, G., Rizzi, J., Sabattini, L., Sampietro, G., Zaccaria, F. 2021. Toward future automatic warehouses: an autonomous depalletizing system based on mobile manipulation and 3D perception. *Applied Sciences*, 11(13), Paper No. 5959, pp. 1-19.
- [17] Idà, E., Briot, S., and Carricato, M. 2021. Natural oscillations of underactuated cable-driven parallel robots. *IEEE Access*, 9, pp. 71660-71672.
- [18] Marchi, T., Mottola, G., Porta, J. M., Thomas, F., and Carricato, M. 2021. Position and singularity analysis of a class of planar parallel manipulators with a reconfigurable end-effector. *Machines*, 9(1), Paper No. 7, pp. 1-19.
- [19] Lin, D., Mottola, G., Carricato, M., and Jiang, X. 2020. Modeling and control of a cable-suspended sling-like parallel robot for throwing operations. *Applied Sciences*, 10(24), Paper No. 9067, pp. 1-17.
- [20] Idà, E., Marian, D., and Carricato, M. 2020. A deployable cable-driven parallel robot with large rotational capabilities for laser-scanning applications. *IEEE Robotics and Automation Letters*, 5(3), pp. 4140-4147.
- [21] Wu, Y., and Carricato, M. 2020. Persistent manifolds of the special Euclidean group SE(3): A review. *Computer Aided Geometric Design*, 79, Paper No. 101872, pp. 1-24.
- [22] Zavatta, M., Chianura, M., Pott, A., Carricato, M. 2020. A vision-based referencing procedure for cable-driven parallel manipulators, *ASME Journal of Mechanisms and Robotics*, 12(4), Paper No. 044502, pp. 1-7.
- [23] Idà, E., Bruckmann, T., and Carricato, M. 2019. Rest-to-rest trajectory planning for underactuated cable-driven parallel robots. *IEEE Transactions on Robotics*, 35(6), pp. 1338 - 1351.
- [24] Wu, Y., and Carricato, M. 2019. Workspace optimization of a class of zero-torsion parallel wrists. *Robotica*, 37(7), pp. 1174-1189.
- [25] Mottola, G., Gosselin, C., and Carricato, M. 2019. Dynamically feasible motions of a class of purely-translational cable-suspended parallel robots. *Mechanism and Machine Theory*, 132, pp. 193-206.
- [26] Meoni, F., and Carricato, M. 2018. Optimal selection of the motor-reducer unit in servo-controlled machinery: a continuous approach. *Mechatronics*, 56, pp. 132-145.
- [27] Wu, Y., and Carricato, M. 2018. Line-symmetric motion generators. *Mechanism and Machine Theory*, 127, pp. 112-125.
- [28] Wu, Y., and Carricato, M. 2018. Symmetric subspace motion generators. *IEEE Transactions on Robotics*, 34(3), pp. 716-735.
- [29] Mottola, G., Gosselin, C., and Carricato, M. 2018. Dynamically feasible periodic trajectories for generic spatial three-degree-of-freedom cable-suspended parallel robots. *ASME Journal of Mechanisms and Robotics*, 10(3), Paper No. 031004, pp. 1-10.
- [30] Wu, Y., and Carricato, M. 2017. Synthesis and singularity analysis of N-UU parallel wrists: A symmetric space approach. *ASME Journal of Mechanisms and Robotics*, 9(5), Paper No. 051013, pp. 1-11.
- [31] Wu, Y., and Carricato, M. 2017. Identification and geometric characterization of Lie triple screw systems and their exponential images. *Mechanism and Machine Theory*, 107, pp. 305-323.
- [32] Selig, J. M., and Carricato, M. 2017. Persistent rigid-body motions and Study's "Ribaucour" problem. *Journal of Geometry*, 108(1), pp. 149-169.
- [33] Löwe, H., Wu, Y., and Carricato, M. 2016. Symmetric subspaces of SE(3). *Advances in Geometry*, 16 (3), pp. 381-388.
- [34] Meoni, F., and Carricato, M. 2016. Design of non-overconstrained energy-efficient multi-axis servo presses for deep-drawing applications. *ASME Journal of Mechanical Design*, 138(6), Paper No. 065001, pp. 1-9.
- [35] Wu, Y., Löwe, H., Carricato, M. and Li, Z. 2016. Inversion symmetry of the Euclidean group: theory and application in robot kinematics. *IEEE Transactions on Robotics*, 32(2), pp. 312-326.
- [36] Berti, A., Merlet, J.-P., and Carricato, M. 2016. Solving the direct geometrico-static problem of underconstrained cable-driven parallel robots by interval analysis. *Int. Journal of Robotics*

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  - [38] Martini, A., Troncossi, M., Carricato, M., and Rivola, A. 2015. Static balancing of a parallel kinematics machine with *Linear-Delta* architecture: theory, design and numerical investigation. *Mechanism and Machine Theory*, 90, pp. 128-141.
  - [39] Martini, A., Troncossi, M., Carricato, M., and Rivola, A. 2014. Elastodynamic behavior of balanced closed-loop mechanisms: numerical analysis of a four-bar linkage. *Meccanica*, 49(3), pp. 601-614.
  - [40] Carricato, M., and Zlatanov, D. 2014. Persistent Screw Systems. *Mechanism and Machine Theory*, 73, pp. 296-313.
  - [41] Carricato, M. 2013. Direct Geometrico-Static Problem of Underconstrained Cable-Driven Parallel Robots with Three Cables. *ASME Journal of Mechanisms and Robotics*, 5(3), Paper No. 031008, pp. 1-10.
  - [42] Carricato, M. 2013. Inverse Geometrico-Static Problem of Underconstrained Cable-Driven Parallel Robots with Three Cables. *ASME Journal of Mechanisms and Robotics*, 5(3), Paper No. 031002, pp. 1-11.
  - [43] Carricato, M., and Merlet, J.-P. 2013. Stability Analysis of Underconstrained Cable-Driven Parallel Robots. *IEEE Transactions on Robotics*, 29(1), pp. 288-296.
  - [44] Abbasnejad, G., and Carricato, M. 2012. Real Solutions of the Direct Geometrico-Static Problem of Under-Constrained Cable-Driven Parallel Robots with 3 Cables: a Numerical Investigation. *Meccanica*, 47(7), pp. 1761-1773.
  - [45] Carricato, M. 2009. Decoupled and Homokinetic Transmission of Rotational Motion via Constant-Velocity Joints in Closed-Chain Orientational Manipulators. *ASME Journal of Mechanisms and Robotics*, 1(4), Paper No. 041008, pp. 1-14.
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  - [47] Carricato, M., and Gosselin, C. 2009. A Statically Balanced Gough/Stewart-type Platform: Conception, Design and Simulation. *ASME Journal of Mechanisms and Robotics*, 1(3), Paper No. 031005, pp. 1-16.
  - [48] Carricato, M., and Gosselin, C. 2009. On the Modeling of Leg Constraints in the Dynamic Analysis of Gough/Stewart-Type Platforms. *ASME Journal of Computational and Nonlinear Dynamics*, 4(1), Paper No. 011008, pp. 1-8.
  - [49] Carricato, M. 2005. Fully Isotropic Four-Degrees-of-Freedom Parallel Mechanisms for Schoenflies Motion. *Int. Journal of Robotics Research*, 24(5), pp. 397-414.
  - [50] Carricato, M., and Parenti-Castelli, V. 2004. A Novel Fully Decoupled Two-Degrees-of-Freedom Parallel Wrist. *Int. Journal of Robotics Research*, 23(6), pp. 661-667.
  - [51] Carricato, M., and Parenti-Castelli, V. 2003. Kinematics of a Family of Translational Parallel Mechanisms with Three 4-DOF Legs and Rotary Actuators. *Journal of Robotic Systems*, 20(7), pp. 373-389.
  - [52] Carricato, M., and Parenti-Castelli, V. 2003. Position Analysis of a New Family of 3-DOF Translational Parallel Manipulators. *ASME Journal of Mechanical Design*, 125(2), pp. 316-322.
  - [53] Carricato, M., and Parenti-Castelli, V. 2003. A Family of 3-DOF Translational Parallel Manipulators. *ASME Journal of Mechanical Design*, 125(2), pp. 302-307.
  - [54] Carricato, M., and Parenti-Castelli, V. 2002. Singularity-Free Fully-Isotropic Translational Parallel Mechanisms. *Int. Journal of Robotics Research*, 21(2), pp. 161-174.
  - [55] Carricato, M., Duffy, J., and Parenti-Castelli, V. 2002. Catastrophe Analysis of a Planar System with Flexural Pivots. *Mechanism and Machine Theory*, 37(7), pp. 693-716.
  - [56] Carricato, M., Parenti-Castelli, V., and Duffy, J. 2001. Inverse Static Analysis of a Planar System with Flexural Pivots. *ASME Journal of Mechanical Design*, 123(1), pp. 43-50.
- SHORT COMMUNICATIONS
- [1] Kong, X., Gosselin, C., and Carricato, M. 2011. Comments on "Design and analysis of a totally decoupled 3-DOF spherical parallel manipulator" by D. Zhang and F. Zhang (*Robotica*, Available on CJO 19 Nov, 2010, doi:10.1017/S0263574710000652). *Robotica*, 29(7), pp. 1101-1103.

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- [1] Carricato, M., Idà, E., Mattioni, V., Vincenzi, S., and Tizi, G. 2021. Robotic arrangement with parallel architecture. WIPO International Publication No. WO2021144685 A1 (publication date: 22.07.2021; priority date: 13.01.2020).
- [2] Carricato, M., and Conconi, M. 2010. Closed-chain rotational mechanism having decoupled and homokinetic actuation. European Patent No. EP2432626 B1 (publication date: 04.12.2013; priority date: 19.05.2009).
- [3] Carricato, M., and Parenti-Castelli, V. 2003. Meccanismo parallelo a tre gradi di libertà con piattaforma traslante (3-DOF parallel mechanism with translating platform). Italian Patent No. ITMI20011872 A1 (publication date: 07.03.2003; priority date: 07.09.2001).

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PAPERS AND BOOK CHAPTERS

- [1] Idà, E., and Carricato, M. 2023. Static workspace computation for four-cable underactuated cable-driven parallel robots. In: *Advances in Mechanism and Machine Science – Proc. of the 16th IFToMM World Congress 2023 – Volume 1*, ed. M. Okada, Springer, pp. 588-598.
- [2] Angelini, M., Idà, E., Bertin, D., Carricato, M., Mantovani, E., Bazzi, D., and Orassi, V. 2023. An underactuated cable-driven parallel robot for marine automated launch and recovery operations. *2023 ASME Int. Design Engineering Technical Conferences*, Boston, MA, USA, Paper No. IDETC2023-110570, pp. 1-10.
- [3] Mattioni, V., Idà, E., Gouttefarde, M., and Carricato, M. 2023. A practical approach for the hybrid joint-space control of overconstrained cable-driven parallel robots. In: *Cable-Driven Parallel Robots – Proc. of the 6th Int. Conference on Cable-Driven Parallel Robots*, eds. S. Caro, A. Pott and T. Bruckmann, Springer, pp. 149-160.
- [4] Gabaldo, S., Idà, E., and Carricato, M. 2023. Pose-estimation methods for planar underactuated cable-driven parallel robots. In: *Cable-Driven Parallel Robots – Proc. of the 6th Int. Conference on Cable-Driven Parallel Robots*, eds. S. Caro, A. Pott and T. Bruckmann, Springer, pp. 3-15.
- [5] Guagliumi, L., Berti, A., Monti, E., and Carricato, M. 2022. A software application for fast liquid-sloshing simulation. In: *Advances in Italian Mechanism Science – Proc. of the 4th Int. Conference of IFToMM Italy*, eds. V. Niola, A. Gasparetto, G. Quaglia, and G. Carbone, Springer, pp. 819–828.
- [6] Morara, G., Baldassarri, A., Diepenbruck, J., Bruckmann, T., and Carricato, M. 2022. Design of a weed-control mobile robot based on electric shock. In: *ROMANSY 24 – Robot Design, Dynamics and Control, Proc. of the 24th CISM IFToMM Symposium*. eds. A. Kecskeméthy and V. Parenti-Castelli, Springer, pp. 220-227.
- [7] Guagliumi, L., Berti, A., Monti, E., and Carricato, M. 2022. Design optimization of a 6-DOF cable-driven parallel robot for complex pick-and-place tasks. In: *ROMANSY 24 – Robot Design, Dynamics and Control, Proc. of the 24th CISM IFToMM Symposium*. eds. A. Kecskeméthy and V. Parenti-Castelli, Springer, pp. 283-291.
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- [10] Di Leva, R., Carricato, M., Gatringer, H., and Müller, A. 2021. Sloshing dynamics estimation for liquid-filled containers under 2-dimensional excitation. *10th ECCOMAS Thematic Conference on Multibody Dynamics*, Budapest, Hungary, pp. 80-89.
- [11] Di Leva, R., Carricato, M., Gatringer, H., and Müller, A. 2021. Time-optimal trajectory planning for anti-sloshing 2-dimensional motions of an industrial robot. *20th International Conference on Advanced Robotics (ICAR 2021)*, Ljubljana, Slovenia, pp. 32-37.
- [12] Idà, E., and Carricato, M. 2021. A new performance index for underactuated cable-driven parallel robots. In: *Cable-Driven Parallel Robots – Proc. of the 5th Int. Conference on Cable-Driven Parallel Robots*, eds. M. Gouttefarde, T. Bruckmann and A. Pott, Springer, pp. 24-36.
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- [15] Zaccaria, F., Briot, S., Chikhaoui, M. T., Idà, E. and Carricato, M. 2020. An analytical formulation for the geometrico-static problem of continuum planar parallel robots. In: *ROMANSY 23 – Robot Design, Dynamics and Control, Proc. of the 23rd CISM IFToMM Symposium*. eds. G. Venture, J. Solis, Y. Takeda and A. Konno, Springer, pp. 512-520.
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