



Mario Selvaggio

Università degli Studi di Napoli Federico II, department of [Electrical Engineering and Information Technology](#), [PRISMA Lab](#) and [ICAROS](#) – Naples, Italy

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CURRENT EMPLOYMENT

Assistant professor at [Università degli Studi di Napoli Federico II](#), department of [Electrical Engineering and Information Technology](#), [PRISMA Lab](#) and [ICAROS](#) center.

Co-founder at [BeyondShape](#) - Spin-off company of the University of Naples Federico II.

Co-founder at [Herobots](#) - Spin-off company of the University of Naples Federico II.

RESEARCH INTERESTS

Shared control/autonomy, robot teleoperation, passivity-based control, soft-robotics, robotic grasping and manipulation, robotic surgery.

EDUCATION

Feb. 2017 - Feb. 2020	Ph.D. (Doctor Europaeus) in Information Technology and Electrical Engineering Università degli Studi di Napoli Federico II Thesis: Shared control telerobotic methods for industrial and surgical robotic systems.
Jan. 2013 - Apr. 2015	M. Sc. in Mechanical Engineering Università degli Studi di Napoli Federico II Thesis: Interactive simulation of kinematic and dynamic chains and their coupling with deformable bodies.
Sep. 2009 - Jan. 2013	B. Sc. in Mechanical Engineering Università degli Studi di Napoli Federico II Thesis: L'espressione dell'incertezza nella misura.

RESEARCH AND PROFESSIONAL EXPERIENCES

Mag. 2020 - Sept. 2023	Post-doc at Università degli Studi di Napoli Federico II , department of Electrical Engineering and Information Technology , PRISMA Lab and ICAROS center. Work topic: nonprehensile dynamic object transportation.
Jun. 2019 - Nov. 2019	Visiting student at University of California Santa Barbara department of Mechanical Engineering - Hawkes group , Santa Barbara, California (US). Work topic: shared control teleoperation of a soft growing robot.
Oct. 2018 - Dec. 2018	Visiting student at Rainbow Team - IRISA, INRIA Rennes - Bretagne Atlantique Campus Universitaire de Beaulieu, Rennes (France). Work topic: task-prioritized shared control teleoperation of a robotic system.

- Nov. 2017 - Dec. 2017 | **Visiting student** at [Équipe de Recherche Lagadic](#) (now [Rainbow Team](#)) - IRISA, INRIA Rennes - Bretagne Atlantique Campus Universitaire de Beaulieu, Rennes (France).
Work topic: haptic guidance and shared control teleoperation of a dual arm robotic system.
- Oct. 2015 - Sep. 2016 | **Intern** at [ADVanced Robotics](#) department, Istituto Italiano di Tecnologia, Genova (Italy).
Member of the [AutoMAP](#) team working on the EU FP7 [EuRoC](#) project. Work topic: haptic feedback teleoperation for robotic mobile manipulation.
- Apr. 2014 - Sep. 2014 | **Master thesis student** at department of [Interactive Engineering Technologies](#), Fraunhofer IGD, Darmstadt (Germany). Thesis topic: modeling and simulation of kinematic chains for deformable bodies animation.

GRANTS, SCHOLARSHIPS, AWARDS AND MEDIA COVERAGE

Grants

2022 | **National Scientific Habilitation (ASN)** - II Fascia - settore 09-G1 - Automatica. Necessary requirement to apply for permanent positions of Associate Professor in Italian Universities.

2018 | **Innovation in Haptics by Young Researchers** - research grant for the project “Haptic guidance methods for robotic surgery”.

Scholarships

2018 | **Coinor Unina Star 2018 Linea 2** - 6-months scholarship spent at the UCSB for the project “EVERTE: EVERSive Robot TELEoperation”.

2017 | **Erasmus+ Traineeship Universities for EU projects** - 2-months scholarship spent at IRISA, INRIA Rennes.

2014 | **LLP - Erasmus Placement Traineeship** - 5-months scholarship.

Awards

2021 | **I-RAS “Fabrizio Flacco” Young Author Best Paper Award 2021 finalist** - for the paper “A shared-control teleoperation architecture for nonprehensile object transportation” published in the IEEE Transactions on Robotics

2019 | **Start Cup Campania** - Spin-Off Company BeyondShape - Awarded first prize

2019 | **Switch 2 Product - Innovation in Bioengineering program** - of the Sixth National Congress of Bioengineering - Awarded second prize

2017 | **IEEE-RAS 1st Robotics Made in Italy video contest** - Awarded second prize ([video](#))

Media Coverage

2023 | **IEEE Spectrum - Video Friday** - featured the video of the paper “Non-prehensile object transportation via model predictive non-sliding manipulation control” published in the IEEE Transactions on Control Systems Technology

PUBLICATIONS

Journal articles

J20: **M. Selvaggio**, R. Moccia, P. Arpentì, R. Caccavale, F. Ruggiero, J. Cacace, F. Ficuciello, A. Finzi, V. Lippello, L. Villani and B. Siciliano, “Robotics goes PRISMA,” *Robotica*, Submitted.

2021 | **IEEE Spectrum - Video Friday** - featured the video of the paper “A shared-control teleoperation architecture for nonprehensile object transportation” published in the IEEE Transactions on Robotics

- J19: M. Gallipoli, S. Buonocore, **M. Selvaggio**, G. A. Fontanelli, S. Grazioso, G. Di Gironimo, “A virtual reality-based dual-mode robot teleoperation architecture,” *Robotica*, Submitted.
- J18: R. Sabella, **M. Selvaggio**, S. Grazioso, B. Siciliano, A. Lanzotti, “Soft growing robots pre-steered by material patching,” *IEEE Access*, Submitted.
- J17: F. Stroppa, **M. Selvaggio**, N. Agharese, M. Luo, L. H. Blumenschein, E. W. Hawkes, and A. M. Okamura, “Shared-control teleoperation paradigms on a soft growing robot manipulator,” *Journal of Intelligent & Robotic Systems*, Accepted.
- J16: **M. Selvaggio**, A. Garg, F. Ruggiero, G. Oriolo, B. Siciliano, “Nonprehensile object transportation via model predictive non-sliding manipulation control,” *IEEE Transactions on Control System Technology*, Vol. 31, No. 5, Pages. 2231-2244, Sept. 2023, DOI:[10.1109/TCST.2023.3277224](https://doi.org/10.1109/TCST.2023.3277224).
- J15: R. Subburaman, **M. Selvaggio**, F. Ruggiero, “A non-prehensile object transportation framework with adaptive tilting based on quadratic programming,” *IEEE Robotics and Automation Letters*, Vol. 8, No. 6, Pages: 3581–3588, Apr. 2023, DOI: [10.1109/LRA.2023.3268594](https://doi.org/10.1109/LRA.2023.3268594).
Also selected for presentation at 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems, Detroit, Michigan, USA.
- J14: **M. Selvaggio**, J. Cacace, C. Pacchierotti, F. Ruggiero, P. Robuffo Giordano, “A shared-control teleoperation architecture for nonprehensile object transportation,” *IEEE Transactions on Robotics*, Vol. 38, No. 1, Pages: 569–583, Feb. 2022, DOI: [10.1109/TRO.2021.3086773](https://doi.org/10.1109/TRO.2021.3086773).
Also selected for presentation at 2022 IEEE International Conference on Robotics and Automation, Philadelphia (PA), USA.
- J13: **M. Selvaggio**, M. Cognetti, S. Nikolaidis, S. Ivaldi, B. Siciliano, “Autonomy in physical human-robot interaction: a brief survey,” *IEEE Robotics and Automation Letters*, Vol. 6, no. 4, Pages: 7989-7996, Oct. 2021, DOI: [10.1109/LRA.2021.3100603](https://doi.org/10.1109/LRA.2021.3100603).
Also selected for presentation at 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems, Prague, Czech Republic (virtual).
- J12: S. Grazioso, A. Tedesco, **M. Selvaggio**, S. Debei, S. Chiodini, “Towards the development of a cyber-physical measurement system (CPMS): case study of a bioinspired soft growing robot for remote measurement and monitoring applications,” *ACTA IMEKO*, Vol. 10, No. 2, Pages: 104–110, 2021, DOI: [10.21014/acta_imeko.v10i2.1123](https://doi.org/10.21014/acta_imeko.v10i2.1123).
- J11: H. Liu, **M. Selvaggio**, P. Ferrentino, R. Moccia, S. Pirozzi, U. Bracale, F. Ficuciello, “The MUSHA hand II: a multi-functional hand for robot-assisted laparoscopic surgery,” *IEEE/ASME Transaction on Mechatronics*, Vol. 26, no. 1, Pages: 393-404, 2020, DOI: [10.1109/TMECH.2020.3022782](https://doi.org/10.1109/TMECH.2020.3022782).
- J10: M. H. Hamedani, M. Zekri, F. Sheikholeslam, **M. Selvaggio**, F. Ficuciello, B. Siciliano, “Recurrent fuzzy wavelet neural network variable impedance control of robotic manipulators with fuzzy gain dynamic surface in an unknown varied environment,” *Fuzzy Sets and Systems*, Vol. 416, Pages: 1–26, 2021, DOI: [10.1016/j.fss.2020.05.001](https://doi.org/10.1016/j.fss.2020.05.001).
- J9: G. A. Fontanelli, **M. Selvaggio**, M. Ferro, F. Ficuciello, M. Vendittelli, B. Siciliano, “Portable dVRK: an augmented V-REP simulator of the da Vinci Research Kit,” *Acta Polytechnica Hungarica*, Vol. 16, no. 8, Pages: 79–98, Sept. 2019, DOI: [10.12700/APH.16.8.2019.8.6](https://doi.org/10.12700/APH.16.8.2019.8.6).

J8: **M. Selvaggio**, G. A. Fontanelli, V. R. Marrazzo, U. Bracale, A. Irace, G. Breglio, L. Villani, B. Siciliano, F. Ficuciello, “The MUSHA underactuated hand for robot-aided minimally invasive surgery,” *International Journal of Medical Robotics and Computer Assisted Surgery*, Vol. 15, no. 3, Pages: e1981, Jan. 2019, DOI: [10.1002/rcs.1981](https://doi.org/10.1002/rcs.1981).

J7: F. Chen, **M. Selvaggio**, D. G. Caldwell, “Dexterous grasping by manipulability selection for mobile manipulator with visual guidance,” *IEEE Transactions on Industrial Informatics*, Vol. 15, no. 2, Pages: 1202-1210, Feb. 2019, DOI: [10.1109/TII.2018.2879426](https://doi.org/10.1109/TII.2018.2879426).

J6: **M. Selvaggio**, F. Abi-Farraj, C. Pacchierotti, P. Robuffo Giordano, B. Siciliano, “Haptic-based shared-control methods for a dual-arm system,” *IEEE Robotics and Automation Letters*, Vol. 3, no. 4, Pages: 4249-4256, Oct. 2018, DOI: [10.1109/LRA.2018.2864353](https://doi.org/10.1109/LRA.2018.2864353).

Also selected for presentation at 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems, Madrid, Spain.

J5: **M. Selvaggio**, G. A. Fontanelli, F. Ficuciello, L. Villani, B. Siciliano, “Passive virtual fixtures adaptation in minimally invasive robotic surgery,” *IEEE Robotics and Automation Letters*, Vol. 3, no. 4, Pages: 3129-3136, Oct. 2018, DOI: [10.1109/LRA.2018.2849876](https://doi.org/10.1109/LRA.2018.2849876).

Also selected for presentation at 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems, Madrid, Spain.

J4: G. A. Fontanelli, **M. Selvaggio**, L. R. Buonocore, F. Ficuciello, L. Villani, B. Siciliano, “A new laparoscopic instrument with in-hand rolling capabilities for needle re-orientation,” *IEEE Robotics and Automation Letters*, Vol. 3, no. 3, Pages: 2354-2361, July 2018, DOI: [10.1109/LRA.2018.2809443](https://doi.org/10.1109/LRA.2018.2809443).

Also selected for presentation at 2018 IEEE International Conference on Robotics and Automation, Brisbane, Australia.

J3: R. Signore, S. Grazioso, A. Fariello, F. Murgia, **M. Selvaggio**, G. Di Gironimo, “Conceptual design and control strategy of a robotic cell for precision assembly in radar antenna systems,” *Procedia Manufacturing*, Vol. 11, Pages: 397-404, 2017, DOI: [10.1016/j.promfg.2017.07.123](https://doi.org/10.1016/j.promfg.2017.07.123).

J2: S. Grazioso, **M. Selvaggio**, G. Di Gironimo, “Design and development of a novel body scanning system for healthcare applications,” *International Journal on Interactive Design and Manufacturing*, Vol. 12, Pages: 611-620, August 2017, DOI: [10.1007/s12008-017-0425-9](https://doi.org/10.1007/s12008-017-0425-9).

J1: G. Notomista, **M. Selvaggio**, F. Sbrizzi, G. Di Maio, S. Grazioso, M. Botsch, “A fast airplane boarding strategy using online seat assignment based on passenger classification,” *Journal of Air Transport Management*, Vol. 53, Pages 140-149, June 2016, DOI: [10.1016/j.jairtraman.2016.02.012](https://doi.org/10.1016/j.jairtraman.2016.02.012).

Book chapters

B1: S. M. Orozco-Soto, E. Cuniato, J. Cacace, **M. Selvaggio**, F. Ruggiero, V. Lippiello, B. Siciliano, “Aerial manipulator interaction with the environment,” *Advances in autonomous aerospace systems - Springer*, Submitted, 2022.

Conference papers

C25: M. Costanzo, C. Natale, **M. Selvaggio**, “Visual and haptic cues for human-robot handover,” *Proceedings of the 2023 32nd IEEE International Conference on Robot and Human Interactive Communication*, Accepted,

C24: F. Bertonecelli, **M. Selvaggio**, F. Ruggiero, L. Sabattini, “Task-oriented contact optimization for pushing manipulation with mobile robots,” *Proceedings of the 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Pages: 1639–1646, Kyoto, Japan, 2022, DOI: [10.1109/IROS47612.2022.9982177](https://doi.org/10.1109/IROS47612.2022.9982177).

- C23: M. Lei, **M. Selvaggio**, T. Wang, F. Ruggiero, C. Zhou, C. Yao, Y. Zheng, “Dual-arm object transportation via model predictive control and external disturbance estimation,” *Proceedings of the 2022 IEEE International Conference on Automation Science and Engineering*, Pages: 2328–2334, Mexico City, Mexico (hybrid), 2022, DOI: [10.1109/CASE49997.2022.9926627](https://doi.org/10.1109/CASE49997.2022.9926627).
- C22: S. Grazioso, A. Tedesco, R. Sabella, S. Fusco; **M. Selvaggio**, L. Duraccio, E. De Benedetto, A. Lanzotti, L. Angrisani, “Using a soft growing robot as a sensor delivery system in remote environments: a practical case study,” *Proceedings of the IEEE International Symposium on Measurements & Networking*, Pages: 1–5, Padua, Italy, 2022, DOI: [10.1109/MN55117.2022.9887783](https://doi.org/10.1109/MN55117.2022.9887783).
- C21: **M. Selvaggio**, S. Grazioso, S. Fusco, R. Sabella, G. A. Fontanelli, G. Di Gironimo, B. Siciliano, A. Lanzotti, “Effects of design parameters on the steering capabilities of fabric pneumatic artificial muscle-actuated soft growing robots,” *Lecture Notes in Mechanical Engineering – Proceedings of the International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing*, Pages: 1215–1226, Ischia, Italy, 2022, DOI: [10.1007/978-3-031-15928-2_106](https://doi.org/10.1007/978-3-031-15928-2_106).
- C20: V. Morlando, **M. Selvaggio**, F. Ruggiero, “Nonprehensile object transportation with a legged manipulator,” *Proceedings of the 2022 IEEE International Conference on Robotics and Automation*, Pages: 6628–6634, Philadelphia (PA), USA, 2022, DOI: [10.1109/ICRA46639.2022.9811810](https://doi.org/10.1109/ICRA46639.2022.9811810).
- C19: E. Cuniato, J. Cacace, **M. Selvaggio**, F. Ruggiero, V. Lippiello, “A hardware-in-the-loop simulator for physical human-aerial manipulator cooperation,” *Proceedings of the 2021 20th International Conference on Advanced Robotics*, Pages: 830–835, Ljubljana, Slovenia (virtual), 2021, DOI: [10.1109/ICAR53236.2021.9659398](https://doi.org/10.1109/ICAR53236.2021.9659398).
- C18: S. Grazioso, A. Tedesco, **M. Selvaggio**, S. Debei, S. Chiodini, E. De Benedetto, G. Di Gironimo, A. Lanzotti, “Design of a soft growing robot as a practical example of cyberphysical measurement systems,” *Proceedings of the 2021 IEEE International Workshop on Metrology for Industry 4.0 & IoT*, Pages: -, Rome, Italy, 2021, DOI: [10.1109/MetroInd4.0IoT51437.2021.9488477](https://doi.org/10.1109/MetroInd4.0IoT51437.2021.9488477).
- C17: **M. Selvaggio**, L. A. Ramirez, B. Siciliano, E. W. Hawkes, “An obstacle-interaction planning method for navigation of actuated vine robots,” *Proceedings of the 2020 IEEE International Conference on Robotics and Automation*, Pages: 3227–3233, Paris, France, 2020 (virtual), DOI: [10.1109/ICRA40945.2020.9196587](https://doi.org/10.1109/ICRA40945.2020.9196587).
- C16: G. Notomista, S. Mayya, **M. Selvaggio**, M. Santos, C. Secchi, “A set-theoretic approach to multi-task execution and prioritization,” *Proceedings of the 2020 IEEE International Conference on Robotics and Automation*, Pages: 9873–9879, Paris, France, 2020 (virtual), DOI: [10.1109/ICRA40945.2020.9196741](https://doi.org/10.1109/ICRA40945.2020.9196741).
- C15: M. H. Hamedani, **M. Selvaggio**, M. Rahimkhani, F. Ficuciello, H. Sadeghian, M. Zekri, F. Sheikholeslam, “Robust dynamic surface control of da Vinci robot manipulator considering uncertainties: A fuzzy-based approach,” *Proceedings of the 2019 7th International Conference on Robotics and Mechatronics*, Pages: 418–423, Tehran, Iran, November 20–21, 2019, DOI: [10.1109/ICRoM48714.2019.9071876](https://doi.org/10.1109/ICRoM48714.2019.9071876).
- C14: **M. Selvaggio**, A. M. Ghalamzan E., R. Moccia, F. Ficuciello, B. Siciliano, “Haptic-guided shared control for needle grasping optimization in minimally invasive robotic surgery,” *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Pages: 3617–3623, Macau, China, November 3–8, 2019, DOI: [10.1109/IROS40897.2019.8968109](https://doi.org/10.1109/IROS40897.2019.8968109).
- C13: R. Moccia, **M. Selvaggio**, L. Villani, B. Siciliano, F. Ficuciello, “Vision-based virtual fixtures generation for robotic-assisted polyp dissection procedures,” *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Pages: 7934–7939, Macau, China, November 3–8, 2019, DOI: [10.1109/IROS40897.2019.8968080](https://doi.org/10.1109/IROS40897.2019.8968080).
- C12: S. Grazioso, T. Caporaso, **M. Selvaggio**, D. Panariello, R. Ruggiero, G. Di Gironimo, “Using photogrammetric 3D body reconstruction for the design of patient-tailored assistive devices,” *Proceedings of the IEEE International Workshop on Metrology for Industry 4.0 and IoT*, -, Naples, Italy, June, 2019, DOI: [10.1109/METROI4.2019.8792894](https://doi.org/10.1109/METROI4.2019.8792894).

- C11: **M. Selvaggio**, P. Robuffo Giordano, F. Ficuciello, B. Siciliano, “Passive task-prioritized shared control teleoperation with haptic guidance,” *Proceedings of the 2019 IEEE International Conference on Robotics and Automation*, Pages: 430-436, Montreal, QC, Canada, May 20-24, 2019, DOI: [10.1109/ICRA.2019.8794197](https://doi.org/10.1109/ICRA.2019.8794197).
- C10: M. Ferro, D. Brunori, F. Magistri, L. Saiella, **M. Selvaggio**, G. A. Fontanelli, “A portable da Vinci simulator in virtual reality,” *Proceedings of the 3rd IEEE International Conference on Robotic Computing*, Pages: 447-448, Napoli, Italy, Feb 25-27, 2019, DOI: [10.1109/IRC.2019.00093](https://doi.org/10.1109/IRC.2019.00093).
- C9: G. A. Fontanelli, **M. Selvaggio**, M. Ferro, F. Ficuciello, M. Vendittelli, B. Siciliano, “A V-REP simulator for the da Vinci Research Kit robotic platform,” *Proceedings of the 7th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics*, Pages: 1056-1061, Enschede, The Netherlands, August 26-29, 2018, DOI: [10.1109/BIOROB.2018.8487187](https://doi.org/10.1109/BIOROB.2018.8487187).
- C8: S. Grazioso, M. Gospodarczyk, **M. Selvaggio**, D. Marzullo, G. Di Gironimo, “Eligere: a fuzzy AHP distributed software platform for group decision making in engineering design,” *Proceedings of the 2017 IEEE International Conference on Fuzzy Systems*, Pages: 1-6, Naples, Italy, July 9-12, 2017, DOI: [10.1109/FUZZ-IEEE.2017.8015713](https://doi.org/10.1109/FUZZ-IEEE.2017.8015713).
- C7: **M. Selvaggio**, S. Grazioso, G. Notomista, F. Chen, “Towards a self-collision aware teleoperation framework for compound robots,” *Proceedings of the 2017 IEEE World Haptics Conference*, Pages: 460 - 465, Fürstfeldbruck (Munich), Germany, June 6-9, 2017 DOI: [10.1109/WHC.2017.7989945](https://doi.org/10.1109/WHC.2017.7989945).
- C6: F. Sbrizzi, S. Grazioso, **M. Selvaggio**, G. Di Maio, G. Notomista, “Enhancing airplane boarding procedure using vision based passenger classification,” *Proceedings of the 2016 IEEE 19th International Conference on Intelligent Transportation Systems*, Pages: 772 - 777, Rio de Janeiro, Brazil, November 1-4, 2016, DOI: [10.1109/ITSC.2016.7795642](https://doi.org/10.1109/ITSC.2016.7795642).
- C5: **M. Selvaggio**, G. Notomista, F. Chen, B. Gao, F. Trapani, D. Caldwell, “Enhancing bilateral teleoperation using camera-based online virtual fixtures generation,” *Proceedings of the 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Pages: 1483 - 1488, Daejeon, Korea, October 9-14, 2016, DOI: [10.1109/IROS.2016.7759241](https://doi.org/10.1109/IROS.2016.7759241).
- C4: F. Chen, B. Gao, **M. Selvaggio**, Z. Li, D. Caldwell, K. Kershaw, A. Masi, M. Di Castro R. Losito, “A framework of teleoperated and stereo vision guided mobile manipulation for industrial automation,” *Proceedings of the 2016 IEEE International Conference on Mechatronics and Automation*, Pages: 1641 - 1648, Harbin, China, August 7-10, 2016, DOI: [10.1109/ICMA.2016.7558810](https://doi.org/10.1109/ICMA.2016.7558810). **Best Automation Paper Finalist.**
- C3: B. Gao, F. Chen, F. Trapani, **M. Selvaggio**, D. Caldwell, “Robust object localization based on error patterns learning for dexterous mobile manipulation,” *Proceedings of the 2016 IEEE International Conference on Advanced Robotics and Mechatronics*, Pages: 213 - 218, Macau, China, August 18-20, 2016, DOI: [10.1109/ICARM.2016.7606921](https://doi.org/10.1109/ICARM.2016.7606921). **Best Cognitive Paper.**
- C2: **M. Selvaggio**, F. Chen, B. Gao, G. Notomista, F. Trapani, D. Caldwell, “Vision based virtual fixture generation for teleoperated robotic manipulation,” *Proceedings of the 2016 IEEE International Conference on Advanced Robotics and Mechatronics*, Pages: 190 - 195, Macau, China, August 18-20, 2016, DOI: [10.1109/ICARM.2016.7606917](https://doi.org/10.1109/ICARM.2016.7606917). **Best Student Paper Finalist.**
- C1: G. Notomista, A. Kammenhuber, P. Nadarajan, M. Botsch, **M. Selvaggio**, “Relative motion estimation based on sensor eigenfusion using a stereoscopic vision system and adaptive statistical filtering,” *Proceedings of the 47th International Symposium on Robotics*, Pages: 1 - 6, Munich, Germany, June 21-22, 2016.

Workshops - short papers

- W14: **M. Selvaggio**, F. Ruggiero, B. Siciliano, “Model-predictive control for non-prehensile tray-based object transportation,” *5th Italian Conference on Robotics and Intelligent Machines*, Fiera di Roma, Italy, October 20-22, 2023.

- W13: **M. Selvaggio**, F. Ruggiero, B. Siciliano, “Model-predictive control for non-prehensile tray-based object transportation,” *IEEE/RSJ IROS 2023 Workshop: Learning Meets Model-based Methods for Manipulation and Grasping*, Detroit, USA, October 5th, 2023.
- W12: V. Morlando, **M. Selvaggio**, F. Ruggiero, “Robotic Non-prehensile Object Transportation,” *4th Italian Conference for Robotics and Intelligent Machines*, Rome, Italy, October 7-9, 2022.
- W11: V. Morlando, **M. Selvaggio**, F. Ruggiero, “Using a legged manipulator for nonprehensile object transportation,” *ICRA 6th Workshop on Legged Robots*, Philadelphia, USA, May 23, 2022.
- W10: **M. Selvaggio**, A. M. Ghalamzan E., R. Moccia, F. Ficuciello, B. Siciliano, “Haptic-guided needle grasing in minimally invasive robotic surgery,” *ICRA Workshop Next Generation Surgery: Seamless Integration of Robotics, Machine Learning and Knowledge Representation within the Operating Rooms*, Montreal, Canada, May 24, 2019.
- W9: R. Moccia, **M. Selvaggio**, B. Siciliano, A. Arezzo, F. Ficuciello, “Vision-based Virtual Fixtures Generation for MIRS Dissection Tasks,” *9th Workshop on New Technologies for Computer/Robot Assisted Surgery*, Genoa, Italy, Mar. 2019.
- W8: R. Moccia, **M. Selvaggio**, F. Ficuciello, “Suturing Needle Tracking for Grasping Optimization in Minimally Invasive Surgery,” *The Hamlyn Symposium on Medical Robotics*, London, UK, June, 2019.
- W7: H. Liu, P. Ferrentino, **M. Selvaggio**, S. Pirozzi, F. Ficuciello, “Design of a multi-functional hand for robot-assisted laparoscopic surgery,” *The Hamlyn Symposium on Medical Robotics*, London, UK, June, 2019.
- W6: **M. Selvaggio**, G. A. Fontanelli, F. Ficuciello, L. Villani, B. Siciliano, “A virtual fixture adaptation strategy for MIRS dissection tasks,” *8th Workshop on New Technologies for Computer/Robot Assisted Surgery*, London, UK, Sep. 2018.
- W5: **M. Selvaggio**, G. A. Fontanelli, F. Ficuciello, L. Villani, B. Siciliano, “Enhancing dexterity with a 7-DoF laparoscopic suturing tool,” *The Hamlyn Symposium on Medical Robotics*, London, UK, June 24-27, 2018.
- W4: **M. Selvaggio**, L. Villani, B. Siciliano, F. Ficuciello, “Physics-based task classification of da Vinci robot surgical procedures,” *Sixth National Congress of Bioengineering*, Milan, Italy, June 25-27, 2018.
- W3: **M. Selvaggio**, G. Notomista, “Towards natural human-swarm teleoperation using hand synergies,” *IEEE ICRA Workshop - Swarms: From Biology to Robotics and Back*, Brisbane, Australia, May, 2018.
- W2: **M. Selvaggio**, G. A. Fontanelli, F. Ficuciello, L. Villani, B. Siciliano, “Task classification of robotic surgical reconstructive procedures using force measurements,” *7th Joint Workshop on New Technologies for Computer/Robot Assisted Surgery*, Montpellier, France, Sept. 14-15, 2017.
- W1: S. Grazioso, **M. Selvaggio**, G. Di Gironimo, R. Ruggiero, “INBODY: instant photogrammetric 3D body scanner,” *7th International Conference on 3D Body Scanning Technologies*, Lugano, Switzerland, Nov. 2016.

PATENTS

- P3: G. A. Fontanelli, S. Grazioso, **M. Selvaggio**, R. Sabella, S. Fusco, G. Di Gironimo, A. Lanzotti, “Procedimento di progettazione e fabbricazione di un soft robot eversivo avente una struttura tubolare capace di crescere lungo un percorso pre-programmato, e apparecchiatura per la sua realizzazione,” *Italian Patent*, 102022000022116, October 2022.
- P2: S. Grazioso, G. Di Gironimo, R. A. Ruggiero, A., T. Caporaso, **M. Selvaggio**, D. Panariello, A. Palomba, A. Grazioso, “System for the image acquisition and three-dimensional digital reconstruction of the human anatomical shapes and method of use thereof,” *International Patent*, PCT/EP2022/057455, March 2022.
- P1: S. Grazioso, G. Di Gironimo, R. A. Ruggiero, A., T. Caporaso, **M. Selvaggio**, D. Panariello, A. Palomba, A. Grazioso, “Sistema per l’acquisizione di immagini e la ricostruzione digitale tridimensionale delle forme anatomiche umane e suo metodo di utilizzo,” *Italian Patent*, 102021000006881, March 2021.

INVITED TALKS AND SEMINARS

- I4: **M. Selvaggio**, “Nonprehensile object transportation via shared-control teleoperation”, Seminar - [Robotics research in Nouvelle-Aquitaine, France](#), Online, June 13, 2022
- I3: **M. Selvaggio**, “Nonprehensile manipulation for assistive healthcare robotics”, ICRA 2022 workshop - [Human centered autonomy in medical robotics](#), Philadelphia, US, May 23, 2022
- I2: **M. Selvaggio**, “Shared control for non-prehensile telemanipulation tasks”, Robotics and AI in Nuclear (RAIN) - [Human-Robot Interaction Workshop](#), Online event, Sep 28 - Oct 1, 2020
- I1: **M. Selvaggio**, “Haptic-based shared control telerobotics: industrial and surgical perspectives”, Università di Modena-Reggio Emilia, Reggio Emilia, May 10, 2019.

MEDIA COVERAGE

- M2: [IEEE Spectrum - Video Friday](#) - weekly selection of the coolest robotics videos [IEEE Spectrum - Video Friday](#) - weekly selection of the coolest robotics videos
- M1: [IEEE Robotics & Automation Magazine](#)

TEACHING EXPERIENCES

- Teaching assistant** for the prof. F. Ruggiero’s course Field and Service Robotics (2021-)
- Teaching assistant** for the prof. B. Siciliano’s Robot Interaction Control course (2019-)
- Teaching assistant** for the prof. B. Siciliano’s Robotics and Industrial Automation course (2019-)
- Teaching assistant** for the prof. B. Siciliano’s Robotics and Autonomous Sensors course (2019-2020)
- Teaching assistant** for the prof. B. Siciliano’s Advanced Robotics course (2018-2019)

As a teaching assistant I delivered lectures, assisted the faculty with classroom instruction, records, and assignments, prepared teaching material, hold meetings with students during office hours, and conference with students individually or in small groups.

ADVISING

PhD students

- 2. Giancarlo D’ago (co-supervised with F. Ruggiero, L. R. Buonocore) - Thesis: “title to be defined”.
- 1. Roberto Sabella (co-supervised with S. Grazioso, G. Di Gironimo) - Thesis: “title to be defined”.

Master’s thesis students

- 9. Michele Avignale (co-supervised with F. Ruggiero, G. D’ago, L. R. Buonocore) - Thesis: “title to be defined”.
- 8. Federico Esposito (co-supervised with F. Ruggiero) - Thesis: “title to be defined”.
- 7. Francesco Cufino (co-supervised with F. Ruggiero) - Thesis: “Admittance-based model predictive control for non-prehensile planar pushing”.
- 6. Akash Garg (co-supervised with G. Oriolo, B. Siciliano, and F. Ruggiero) - Thesis: “Nonprehensile Object Transportation using Model Predictive Control”.
- 5. Salvatore Fusco (co-supervised with S. Grazioso, G. Di Gironimo, and A. Lanzotti) - Thesis: “Design and development of a multipurpose bioinspired soft growing robotic platform”.
- 4. Roberto Sabella (co-supervised with S. Grazioso, G. Di Gironimo, B. Siciliano and G. A. Fontanelli) - Thesis: “Design, prototyping and characterization of a multipurpose bioinspired soft growing robot”.

3. Beatrice Ramaglia (co-supervised with F. Ruggiero) - Thesis: “dynamic simulation of a cable-suspended aerial manipulator under oscillation reduction control”.
2. Diego Taglialatela (co-supervised with F. Ruggiero) - Thesis: “Controllo predittivo basato su modello per spinta planare non prensile”.
1. Angelo Carfora (co-supervised with B. Siciliano and F. Ficuciello) - Thesis: “Force-based task classification of da Vinci robot surgical procedures”.

Bachelor’s thesis students

6. Angelo Di Porzio (co-supervised with F. Ruggiero) - Thesis: “Controllo predittivo basato su modello per la manipolazione non prensile di un oggetto rigido”.
5. Carmela Mariniello (co-supervised with F. Ruggiero and V. Morlando) - Thesis: “Teleoperazione di un robot quadrupede all’interno di un ambiente di simulazione dinamico”
4. Eliana La Frazia (co-supervised with L. Villani, G. Breglio, and F. Ficuciello) - Thesis: “Caratterizzazione sperimentale di un sensore di forza a fibra ottica con reticolo di Bragg per uno strumento chirurgico antropomorfo”.
3. Viviana Morlando (co-supervised with L. Villani and F. Ficuciello) - Thesis: “Cinematica ed attuazione di uno strumento antropomorfo per la chirurgia robotica”.
2. Carlo Motta (co-supervised with L. Villani, F. Ficuciello and G. A. Fontanelli) - Thesis: “Progettazione di un sistema di attuazione di un tool per il robot daVinci”.
1. Davide Astarita (co-supervised with L. Villani and F. Ficuciello) - Thesis: “Progettazione dell’architettura software per il controllo di un tool per il robot daVinci”.

PROFESSIONAL SERVICE

Workshop and special sessions organization

Co-organizer of the special session “[Visual and Haptic Cues for Physical Human-Robot Interaction and Co-Manipulation](#)” at the [IEEE International Conference on Robot and Human Interactive Communication](#), August 28-31, 2023, Paradise Hotel, Busan, Korea.

Co-organizer of the workshop “[Embracing contacts: making robots physically interact with our world](#)” at the [2023 IEEE International Conference on Robotics and Automation](#), London, England, May 23-27, 2023.

Organizer of the special session “Design for Soft Robotics” at the [2022 International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing \(JCM\)](#), June 1-3, 2022 - Hotel Continental - Ischia (Italy).

Main organizer of the workshop “[Shared Autonomy in Physical Human-Robot Interaction: Adaptability and Trust](#)”, held at the [2022 IEEE International Conference on Robotics and Automation](#), May 23-27, 2022 Philadelphia (PA), USA.

Co-organizer of the workshop “[Design, Learning, and Control for Safe Human-Robot Collaboration](#)” held at the 20th International Conference on Advanced Robotics, Ljublijana, Slovenia (online), December 6-10, 2021.

Main organizer of the workshop “[Shared autonomy: learning and control](#)”, held at the [2020 IEEE International Conference on Robotics and Automation](#), Paris, France (online), May 31 - June 4, 2020.

Editorial service

Associate editor for the [32nd IEEE International Conference on Robot and Human Interactive Communication \(RO-MAN 2023\)](#).

Associate editor for the [Frontiers in Robotics and AI](#) in the area of Computational Intelligence in Robotics 2022-today.

Associate editor for the [IEEE International Conference on Robotics and Automation \(ICRA\)](#) in the area of Medical and Rehabilitation Robotics 2022-today.

Associate editor for the [IEEE Robotics and Automation Letters \(RA-L\)](#) in the area of Human-Centered Robotics and Automation, 2021-today.

Associate editor for the [20th International Conference on Advanced Robotics](#), 2021-today.

Guest associate editor for the special issue “[Advanced Technologies for Autonomous Surgical Robotics](#)” organized in the MDPI Robotics journal, 2021.

Guest associate editor for the special issue “[Shared Autonomy for Physical Human-Robot Interaction](#)” organized in the [IEEE Robotics and Automation Letters](#), 2021.

Chair/co-chair and program committees

Co-chair for the [2022 IEEE 18th International Conference on Automation Science and Engineering](#) session: Motion and Path Planning and Control.

Co-chair for the [2021 IEEE/RSJ International Conference on Intelligent Robots and Systems](#) session: Shared Autonomy for Physical Human-Robot Interaction.

Program committee member, of the International Workshop on [Human-Friendly Robotics 2021](#), held in Bologna, Italy, October 21-22, 2021.

Program committee member, 13th International Workshop on [Human-Friendly Robotics 2020](#), held in Innsbruck, Austria, October 22-23, 2020.

Program committee member, 12th International Workshop on [Human-Friendly Robotics 2019](#), held in Reggio Emilia, Italy, October 24-25, 2019.

Local arrangement chair, 10th International Workshop on [Human-Friendly Robotics 2017](#), held in Napoli, Italy, November 6-7, 2017.

Reviewer

IEEE Transactions on Control System Technology (TCST); Robotics Science and Systems; Frontiers in Robotics and AI; IEEE Transactions on Robotics (T-RO); IEEE Robotics and Automation Magazine (RAM); IEEE Transactions on Cognitive and Developmental Systems (TCDS); International Conference on Intelligent Computing (ICIC); IEEE Transactions on Cybernetics (TCYB); International Conference on Advanced Robotics (ICAR); Journal of Dynamic Systems, Measurement and Control; International Journal of Robotic Research (IJRR); Journal of Air Transport Management; IEEE International Conference on Systems, Man, and Cybernetics (SMC); Acta Polytechnica Hungarica; Science Robotics; IEEE Robotics and Automation Letters (RA-L); IEEE International Conference on Robotics and Automation (ICRA); IEEE/RJS International Conference on Intelligent Robots and Systems (IROS); IEEE/ASME Transactions on Mechatronics (TMECH); Mechatronics; World Haptics Conference (WHC); IEEE Transactions on Haptics (ToH); IEEE Access.

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