

Manuel Beschi

Born on 24th April 1986 in Castiglione delle Stiviere (MN), Italy
Nationality: Italian

Email: manuel.beschi@unibs.it
Web: [Personal](#), [Laboratory](#)

Scopus: [49962916100](#) Google scholar: [xWiW2YoAAAAJ](#)

Current position

Associate Professor in Automatic Control, member of [Industrial Control Systems Group](#) at [Department of Mechanical and Industrial Engineering - University of Brescia](#), Italy.
Scientific director of the [Joint Research Lab "Automatic Control for Intelligent Robots"](#).

Resume

- 2022- Associate Professor in Automatic Control, [Department of Mechanical and Industrial Engineering - University of Brescia](#), Italy.
- 2019-2022 Tenure track Researcher in Automatic Control, [Department of Mechanical and Industrial Engineering - University of Brescia](#), Italy.
- 2015-2019 Researcher at [Institute of Intelligent Industrial Technologies and Systems for Advanced Manufacturing - National research Council of Italy](#).
- 2014-2015 Post-doc research fellow at [Institute of Intelligent Industrial Technologies and Systems for Advanced Manufacturing - National research Council of Italy](#).
- 2014 Ph.D in Control System from the University of Brescia, Italy. Thesis topic: Event-based and model-based control strategies with applications to solar energy. Supervisor: Prof. [Antonio Visioli](#).
- 2010-2013 Ph.D Student at the University of Brescia, Italy.
- 2010 M.Sc. cum laude in Industrial Automation Engineering from the University of Brescia, Italy. Supervisors: Prof. [Antonio Visioli](#) and Prof. [Manuel Berenguel](#) (University of Almeria). The thesis was carried out at the [Plataforma Solar de Almeria](#), Spain.
- 2008 B.Sc. cum laude in Industrial Automation Engineering from the University of Brescia, Italy. Supervisor: Prof. [Antonio Visioli](#).

Research activities

My research interests are automatic control, mainly applied in mechatronic systems and human-robot collaboration:

- *Path planning*: Multigoal sample-based motion planning, online replanning
- *Online motion planning*: Human-aware motion planning for safe collaborative cell (ISO TC 15066)
- *Human-robot collaboration*: Integration of task planning, motion planning and assembly control.
- *Event-based control*: stability and limit-cycle analysis

RESEARCH PROJECTS

- **IMOCO4.E** ECSEL-2020-2-RIA - ECSEL-2020-2-RIA): Principal Investigator for University of Brescia.
- **PUSH-CCC** HORIZON-EIC-2022-PATHFINDERCHALLENGES-01-02): Team member
- **Pickplace** (H2020-ICT-2017-1 – IA): Principal Investigator for CNR-STIIMA.
- **Rosdyn** (FTP project RosDyn, founded by EU H2020 ICT Rosin): Principal Investigator for CNR-STIIMAr.
- **Sharework** (H2020-ICT-2018 -1 – RIA): Team Member
- **3A-ITALY** (Italian Project PNRR-PE11): Team Member
- **FourByThree** (EU H2020 ICT NMP FoT): Task leader
- **Flexicast** (EU FP7 NMP): Task leader
- **Euroc** (FP7 2013 NMP ICT FOF EUROCC): Task leader
- **Cybersort** (Reginal project: Lombardy): Task leader
- **HAF** (Regional project: Lombardy): Team Member

Teaching activity

2020- Automatic Control Laboratory (Master Degree in Industrial Automation Engineering)
2020- Control systems (Master Degree in Mechanical Engineering)
2022- Control System (Bachelor Degree in Product and Process Industrial Techniques)

Publications

INTERNATIONAL JOURNALS

References

- [1] M. Faroni, N. Pedrocchi, and M. Beschi. “Accelerating sampling-based optimal path planning via adaptive informed sampling”. In: *Autonomous Robots* 48.2 (2024). cited By 0. DOI: [10.1007/s10514-024-10157-5](https://doi.org/10.1007/s10514-024-10157-5).
- [2] M. Faroni, A. Umbrico, M. Beschi, A. Orlandini, A. Cesta, and N. Pedrocchi. “Optimal Task and Motion Planning and Execution for Multiagent Systems in Dynamic Environments”. In: *IEEE Transactions on Cybernetics* 54.6 (2024). cited By 3, pp. 3366–3377. DOI: [10.1109/TCYB.2023.3263380](https://doi.org/10.1109/TCYB.2023.3263380).
- [3] P. Franceschi, N. Pedrocchi, and M. Beschi. “Human-Robot Role Arbitration via Differential Game Theory”. In: *IEEE Transactions on Automation Science and Engineering* (2023). cited By 2, pp. 1–16. DOI: [10.1109/TASE.2023.3320708](https://doi.org/10.1109/TASE.2023.3320708).
- [4] P. Franceschi, N. Pedrocchi, and M. Beschi. “Identification of human control law during physical Human–Robot Interaction”. In: *Mechatronics* 92 (2023). cited By 5. DOI: [10.1016/j.mechatronics.2023.102986](https://doi.org/10.1016/j.mechatronics.2023.102986).
- [5] C. Tonola, M. Faroni, M. Beschi, and N. Pedrocchi. “Anytime Informed Multi-Path Replanning Strategy for Complex Environments”. In: *IEEE Access* 11 (2023). cited By 7, pp. 4105–4116. DOI: [10.1109/ACCESS.2023.3235652](https://doi.org/10.1109/ACCESS.2023.3235652).
- [6] E. Villagrossi, M. Delledonne, M. Faroni, M. Beschi, and N. Pedrocchi. “Hiding task-oriented programming complexity: an industrial case study”. In: *International Journal of Computer Integrated Manufacturing* 36.11 (2023). cited By 2, pp. 1629–1648. DOI: [10.1080/0951192X.2023.2203676](https://doi.org/10.1080/0951192X.2023.2203676).
- [7] M. Faroni, M. Beschi, and N. Pedrocchi. “Safety-Aware Time-Optimal Motion Planning With Uncertain Human State Estimation”. In: *IEEE Robotics and Automation Letters* 7.4 (2022). cited By 12, pp. 12219–12226. DOI: [10.1109/LRA.2022.3211493](https://doi.org/10.1109/LRA.2022.3211493).
- [8] C. Guarino Lo Bianco, M. Faroni, M. Beschi, and A. Visioli. “A Predictive Technique for the Real-Time Trajectory Scaling under High-Order Constraints”. In: *IEEE/ASME Transactions on Mechatronics* 27.1 (2022). cited By 6, pp. 315–326. DOI: [10.1109/TMECH.2021.3063627](https://doi.org/10.1109/TMECH.2021.3063627).
- [9] M. Shahabi, H. Ghariblu, and M. Beschi. “Comparison of different sample-based motion planning methods in redundant robotic manipulators”. In: *Robotica* 40.9 (2022). cited By 4, pp. 3104–3119. DOI: [10.1017/S026357472200008X](https://doi.org/10.1017/S026357472200008X).
- [10] A. Umbrico, A. Orlandini, A. Cesta, M. Faroni, M. Beschi, N. Pedrocchi, A. Scala, P. Tavormina, S. Koukas, A. Zalonis, N. Fourtakas, P. Kotsaris, D. Andronas, and S. Makris. “Design of Advanced Human–Robot Collaborative Cells for Personalized Human–Robot Collaborations”. In: *Applied Sciences (Switzerland)* 12.14 (2022). cited By 11. DOI: [10.3390/app12146839](https://doi.org/10.3390/app12146839).

- [11] A. Abba et al. “The novel Mechanical Ventilator Milano for the COVID-19 pandemic”. In: *Physics of Fluids* 33.3 (2021). cited By 33. DOI: [10.1063/5.0044445](https://doi.org/10.1063/5.0044445).
- [12] C. Copot, C. Muresan, M. Beschi, and C. Ionescu. “A 6dof virtual environment space docking operation with human supervision”. In: *Applied Sciences (Switzerland)* 11.8 (2021). cited By 5. DOI: [10.3390/app11083658](https://doi.org/10.3390/app11083658).
- [13] M. Faroni, M. Beschi, A. Visioli, and N. Pedrocchi. “A real-time trajectory planning method for enhanced path-tracking performance of serial manipulators”. In: *Mechanism and Machine Theory* 156 (2021). cited By 11. DOI: [10.1016/j.mechmachtheory.2020.104152](https://doi.org/10.1016/j.mechmachtheory.2020.104152).
- [14] L. Hao, R. Pagani, M. Beschi, and G. Legnani. “Dynamic and friction parameters of an industrial robot: Identification, comparison and repetitiveness analysis”. In: *Robotics* 10.1 (2021). cited By 20. DOI: [10.3390/robotics10010049](https://doi.org/10.3390/robotics10010049).
- [15] S. Kianoush, S. Savazzi, M. Beschi, S. Sigg, and V. Rampa. “A Multisensory Edge-Cloud Platform for Opportunistic Radio Sensing in Cobot Environments”. In: *IEEE Internet of Things Journal* 8.2 (2021). cited By 21, pp. 1154–1168. DOI: [10.1109/JIOT.2020.3011809](https://doi.org/10.1109/JIOT.2020.3011809).
- [16] S. Mutti, G. Nicola, M. Beschi, N. Pedrocchi, and L. Tosatti. “Towards optimal task positioning in multi-robot cells, using nested meta-heuristic swarm algorithms”. In: *Robotics and Computer-Integrated Manufacturing* 71 (2021). cited By 16. DOI: [10.1016/j.rcim.2021.102131](https://doi.org/10.1016/j.rcim.2021.102131).
- [17] C. Nuzzi, S. Pasinetti, R. Pagani, S. Ghidini, M. Beschi, G. Coffetti, and G. Sansoni. “MEGURU: a gesture-based robot program builder for Meta-Collaborative workstations”. In: *Robotics and Computer-Integrated Manufacturing* 68 (2021). cited By 27. DOI: [10.1016/j.rcim.2020.102085](https://doi.org/10.1016/j.rcim.2020.102085).
- [18] M. Shahabi, H. Ghariblu, M. Beschi, and N. Pedrocchi. “Path Planning Methodology for Multi-Layer Welding of Intersecting Pipes Considering Collision Avoidance”. In: *Robotica* 39.6 (2021). cited By 6, pp. 945–958. DOI: [10.1017/S026357472000082X](https://doi.org/10.1017/S026357472000082X).
- [19] M. Faroni, M. Beschi, C. Guarino Lo Bianco, and A. Visioli. “Predictive joint trajectory scaling for manipulators with kinodynamic constraints”. In: *Control Engineering Practice* 95 (2020). cited By 18. DOI: [10.1016/j.conengprac.2019.104264](https://doi.org/10.1016/j.conengprac.2019.104264).
- [20] M. Faroni, M. Beschi, and N. Pedrocchi. “Inverse Kinematics of Redundant Manipulators with Dynamic Bounds on Joint Movements”. In: *IEEE Robotics and Automation Letters* 5.4 (2020). cited By 13, pp. 6435–6442. DOI: [10.1109/LRA.2020.3013879](https://doi.org/10.1109/LRA.2020.3013879).
- [21] S. Ghidini, M. Beschi, and N. Pedrocchi. “A Robust Linear Control Strategy to Enhance Damping of a Series Elastic Actuator on a Collaborative Robot”. In: *Journal of Intelligent and Robotic Systems: Theory and Applications* 98.3-4 (2020). cited By 8, pp. 627–641. DOI: [10.1007/s10846-019-01071-5](https://doi.org/10.1007/s10846-019-01071-5).
- [22] L. Simoni, M. Beschi, A. Visioli, and K. Åström. “Inclusion of the dwell time effect in the LuGre friction model”. In: *Mechatronics* 66 (2020). cited By 22. DOI: [10.1016/j.mechatronics.2020.102345](https://doi.org/10.1016/j.mechatronics.2020.102345).

- [23] M. Beschi, S. Mutti, G. Nicola, M. Faroni, P. Magnoni, E. Villagrossi, and N. Pedrocchi. “Optimal robot motion planning of redundant robots in machining and additive manufacturing applications”. In: *Electronics (Switzerland)* 8.12 (2019). cited By 19. DOI: [10.3390/electronics8121437](https://doi.org/10.3390/electronics8121437).
- [24] M. Faroni, M. Beschi, N. Pedrocchi, and A. Visioli. “Predictive Inverse Kinematics for Redundant Manipulators with Task Scaling and Kinematic Constraints”. In: *IEEE Transactions on Robotics* 35.1 (2019). cited By 49, pp. 278–285. DOI: [10.1109/TR0.2018.2871439](https://doi.org/10.1109/TR0.2018.2871439).
- [25] E. Rodríguez-Miranda, M. Beschi, J. Guzmán, M. Berenguel, and A. Visioli. “Daytime/nighttime event-based pi control for the PH of a microalgae raceway reactor”. In: *Processes* 7.5 (2019). cited By 16. DOI: [10.3390/pr7050247](https://doi.org/10.3390/pr7050247).
- [26] M. Shahabi, H. Ghariblu, and M. Beschi. “Obstacle avoidance of redundant robotic manipulators using safety ring concept”. In: *International Journal of Computer Integrated Manufacturing* 32.7 (2019). cited By 7, pp. 695–704. DOI: [10.1080/0951192X.2019.1599438](https://doi.org/10.1080/0951192X.2019.1599438).
- [27] L. Simoni, M. Beschi, G. Legnani, and A. Visioli. “Modelling the temperature in joint friction of industrial manipulators”. In: *Robotica* 37.5 (2019). cited By 22, pp. 906–927. DOI: [10.1017/S0263574717000509](https://doi.org/10.1017/S0263574717000509).
- [28] M. Faroni, M. Beschi, N. Pedrocchi, and A. Visioli. “Viability and feasibility of constrained kinematic control of manipulators”. In: *Robotics* 7.3 (2018). cited By 9. DOI: [10.3390/robotics7030041](https://doi.org/10.3390/robotics7030041).
- [29] L. Merigo, M. Beschi, F. Padula, and A. Visioli. “A noise-filtering event generator for PIDPlus controllers”. In: *Journal of the Franklin Institute* 355.2 (2018). cited By 16, pp. 774–802. DOI: [10.1016/j.jfranklin.2017.11.041](https://doi.org/10.1016/j.jfranklin.2017.11.041).
- [30] L. Roveda, N. Pedrocchi, M. Beschi, and L. Molinatti Tosatti. “High-accuracy robotized industrial assembly task control schema with force overshoots avoidance”. In: *Control Engineering Practice* 71 (2018). cited By 40, pp. 142–153. DOI: [10.1016/j.conengprac.2017.10.015](https://doi.org/10.1016/j.conengprac.2017.10.015).
- [31] E. Villagrossi, N. Pedrocchi, M. Beschi, and L. Molinari Tosatti. “A human mimicking control strategy for robotic deburring of hard materials”. In: *International Journal of Computer Integrated Manufacturing* 31.9 (2018). cited By 18, pp. 869–880. DOI: [10.1080/0951192X.2018.1447688](https://doi.org/10.1080/0951192X.2018.1447688).
- [32] E. Villagrossi, L. Simoni, M. Beschi, N. Pedrocchi, A. Marini, L. Molinari Tosatti, and A. Visioli. “A virtual force sensor for interaction tasks with conventional industrial robots”. In: *Mechatronics* 50 (2018). cited By 32, pp. 78–86. DOI: [10.1016/j.mechatronics.2018.01.016](https://doi.org/10.1016/j.mechatronics.2018.01.016).
- [33] M. Beschi, F. Padula, and A. Visioli. “The generalised isodamping approach for robust fractional PID controllers design”. In: *International Journal of Control* 90.6 (2017). cited By 43, pp. 1157–1164. DOI: [10.1080/00207179.2015.1099076](https://doi.org/10.1080/00207179.2015.1099076).
- [34] M. Beschi, E. Villagrossi, L. Tosatti, and D. Surdilovic. “Sensorless model-based object-detection applied on an underactuated adaptive hand enabling an impedance behavior”. In: *Robotics and Computer-Integrated Manufacturing* 46 (2017). cited By 13, pp. 38–47. DOI: [10.1016/j.rcim.2016.11.005](https://doi.org/10.1016/j.rcim.2016.11.005).

- [35] L. Merigo, M. Beschi, F. Padula, N. Latronico, M. Paltenghi, and A. Visioli. “Event-Based control of depth of hypnosis in anesthesia”. In: *Computer Methods and Programs in Biomedicine* 147 (2017). cited By 42, pp. 63–83. DOI: [10.1016/j.cmpb.2017.06.007](https://doi.org/10.1016/j.cmpb.2017.06.007).
- [36] Á. Ruiz, M. Beschi, A. Visioli, S. Dormido, and J. Jiménez. “A unified event-based control approach for FOPTD and IPTD processes based on the filtered Smith predictor”. In: *Journal of the Franklin Institute* 354.2 (2017). cited By 17, pp. 1239–1264. DOI: [10.1016/j.jfranklin.2016.11.017](https://doi.org/10.1016/j.jfranklin.2016.11.017).
- [37] E. Villagrossi, C. Cenati, N. Pedrocchi, M. Beschi, and L. Molinari Tosatti. “Flexible robot-based cast iron deburring cell for small batch production using single-point laser sensor”. In: *International Journal of Advanced Manufacturing Technology* 92.1-4 (2017). cited By 28, pp. 1425–1438. DOI: [10.1007/s00170-017-0232-2](https://doi.org/10.1007/s00170-017-0232-2).
- [38] M. Beschi, M. Berenguel, A. Visioli, and L. Yebra. “On reduction of control effort in feedback linearization GPC strategy applied to a solar furnace”. In: *Optimal Control Applications and Methods* 37.3 (2016). cited By 11, pp. 521–536. DOI: [10.1002/oca.2194](https://doi.org/10.1002/oca.2194).
- [39] M. Beschi, F. Padula, and A. Visioli. “Fractional robust PID control of a solar furnace”. In: *Control Engineering Practice* 56 (2016). cited By 45, pp. 190–199. DOI: [10.1016/j.conengprac.2016.04.005](https://doi.org/10.1016/j.conengprac.2016.04.005).
- [40] A. Pawlowski, M. Beschi, J. Guzmán, A. Visioli, M. Berenguel, and S. Dormido. “Application of SSOD-PI and PI-SSOD event-based controllers to greenhouse climatic control”. In: *ISA Transactions* 65 (2016). cited By 33, pp. 525–536. DOI: [10.1016/j.isatra.2016.08.008](https://doi.org/10.1016/j.isatra.2016.08.008).
- [41] M. Beschi, S. Dormido, J. Sánchez, and A. Visioli. “Closed-Loop Automatic Tuning Technique for an Event-Based PI Controller”. In: *Industrial and Engineering Chemistry Research* 54.24 (2015). cited By 13, pp. 6362–6370. DOI: [10.1021/acs.iecr.5b01024](https://doi.org/10.1021/acs.iecr.5b01024).
- [42] M. Beschi, S. Dormido, J. Sanchez, A. Visioli, and L. Yebra. “Event-based PI plus feedforward control strategies for a distributed solar collector field”. In: *IEEE Transactions on Control Systems Technology* 22.4 (2014). cited By 31, pp. 1615–1622. DOI: [10.1109/TCST.2013.2279216](https://doi.org/10.1109/TCST.2013.2279216).
- [43] M. Beschi, S. Dormido, J. Sánchez, and A. Visioli. “Tuning of symmetric send-on-delta proportional-integral controllers”. In: *IET Control Theory and Applications* 8.4 (2014). cited By 43, pp. 248–259. DOI: [10.1049/iet-cta.2013.0048](https://doi.org/10.1049/iet-cta.2013.0048).
- [44] M. Beschi, S. Dormido, J. Sánchez, and A. Visioli. “Two degree-of-freedom design for a send-on-delta sampling PI control strategy”. In: *Control Engineering Practice* 30 (2014). cited By 9, pp. 55–66. DOI: [10.1016/j.conengprac.2014.06.002](https://doi.org/10.1016/j.conengprac.2014.06.002).
- [45] M. Beschi, M. Berenguel, A. Visioli, J. Guzmán, and L. Yebra. “Implementation of feedback linearization GPC control for a solar furnace”. In: *Journal of Process Control* 23.10 (2013). cited By 25, pp. 1545–1554. DOI: [10.1016/j.jprocont.2013.02.002](https://doi.org/10.1016/j.jprocont.2013.02.002).

- [46] M. Beschi, M. Berenguel, A. Visioli, and L. Yebra. “Constrained control strategies for disturbance rejection in a solar furnaces”. In: *Control Engineering Practice* 21.10 (2013). cited By 13, pp. 1410–1421. DOI: [10.1016/j.conengprac.2013.06.011](https://doi.org/10.1016/j.conengprac.2013.06.011).
- [47] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “Characterization of symmetric send-on-delta PI controllers”. In: *Journal of Process Control* 22.10 (2012). cited By 84, pp. 1930–1945. DOI: [10.1016/j.jprocont.2012.09.005](https://doi.org/10.1016/j.jprocont.2012.09.005).
- [48] M. Beschi, A. Visioli, M. Berenguel, and L. Yebra. “Constrained temperature control of a solar furnace”. In: *IEEE Transactions on Control Systems Technology* 20.5 (2012). cited By 21, pp. 1263–1274. DOI: [10.1109/TCST.2011.2164795](https://doi.org/10.1109/TCST.2011.2164795).

INTERNATIONAL CONFERENCES

References

- [1] M. Delledonne, E. Villagrossi, and M. Beschi. “Optimizing parameters of robotic task-oriented programming via a multiphysics simulation”. In: vol. 2023-September. cited By 0. 2023. DOI: [10.1109/ETFA54631.2023.10275720](https://doi.org/10.1109/ETFA54631.2023.10275720).
- [2] P. Franceschi, F. Bertini, F. Braghin, L. Roveda, N. Pedrocchi, and M. Beschi. “Learning Human Motion Intention for pHRI Assistive Control”. In: cited By 0. 2023, pp. 7870–7877. DOI: [10.1109/IR0S55552.2023.10342014](https://doi.org/10.1109/IR0S55552.2023.10342014).
- [3] P. Franceschi, M. Beschi, N. Pedrocchi, and A. Valente. “Modeling and Analysis of pHRI with Differential Game Theory”. In: cited By 0. 2023, pp. 277–284. DOI: [10.1109/ICAR58858.2023.10406758](https://doi.org/10.1109/ICAR58858.2023.10406758).
- [4] P. Franceschi, M. MacCarini, D. Piga, M. Beschi, and L. Roveda. “Human Preferences’ Optimization in pHRI Collaborative Tasks”. In: cited By 2. 2023, pp. 693–699. DOI: [10.1109/UR57808.2023.10202313](https://doi.org/10.1109/UR57808.2023.10202313).
- [5] R. Pagani, M. Beschi, D. Colombo, G. Facchini, and A. Visioli. “An Autotuning Procedure for Motion Control Systems: Method and at-the-edge Implementation”. In: vol. 2023-September. cited By 0. 2023. DOI: [10.1109/ETFA54631.2023.10275356](https://doi.org/10.1109/ETFA54631.2023.10275356).
- [6] C. Tonola, M. Beschi, M. Faroni, and N. Pedrocchi. “OpenMORE: An open-source tool for sampling-based path replanning in ROS”. In: vol. 2023-September. cited By 1. 2023. DOI: [10.1109/ETFA54631.2023.10275365](https://doi.org/10.1109/ETFA54631.2023.10275365).
- [7] M. Beschi, C. Tonola, and A. Visioli. “Teaching control courses online during the covid-19 pandemic: some experiences at the University of Brescia”. In: vol. 55. 17. cited By 1. 2022, pp. 103–108. DOI: [10.1016/j.ifacol.2022.09.232](https://doi.org/10.1016/j.ifacol.2022.09.232).
- [8] R. Fausti, M. Beschi, D. Colombo, and A. Visioli. “Comparing repetitive control strategies in lift applications”. In: vol. 2022-September. cited By 1. 2022. DOI: [10.1109/ETFA52439.2022.9921429](https://doi.org/10.1109/ETFA52439.2022.9921429).

- [9] P. Franceschi, N. Pedrocchi, and M. Beschi. “Adaptive Impedance Controller for Human-Robot Arbitration based on Cooperative Differential Game Theory”. In: cited By 10. 2022, pp. 7881–7887. DOI: [10.1109/ICRA46639.2022.9811853](https://doi.org/10.1109/ICRA46639.2022.9811853).
- [10] P. Franceschi, N. Pedrocchi, and M. Beschi. “Inverse Optimal Control for the identification of human objective: a preparatory study for physical Human-Robot Interaction”. In: vol. 2022-September. cited By 6. 2022. DOI: [10.1109/ETFA52439.2022.9921553](https://doi.org/10.1109/ETFA52439.2022.9921553).
- [11] J. Guzmán, K. Žáková, I. Craig, T. Hägglund, D. Rivera, J. Normey-Rico, P. Moura-Oliveira, L. Wang, A. Serbezov, T. Sato, and M. Beschi. “Teaching Control during the COVID-19 Pandemic”. In: vol. 55. 17. cited By 1. 2022, pp. 31–36. DOI: [10.1016/j.ifacol.2022.09.221](https://doi.org/10.1016/j.ifacol.2022.09.221).
- [12] C. Tonola, M. Faroni, N. Pedrocchi, and M. Beschi. “Anytime informed path re-planning and optimization for human-robot collaboration”. In: cited By 9. 2021, pp. 997–1002. DOI: [10.1109/RO-MAN50785.2021.9515422](https://doi.org/10.1109/RO-MAN50785.2021.9515422).
- [13] R. Vilanova, C. Pedret, M. Barbu, M. Beschi, and A. Visioli. “Robustness issues in event-based pi control systems: Internal model control tuning”. In: *Lecture Notes in Electrical Engineering* 695 LNEE (2021). cited By 1, pp. 518–527. DOI: [10.1007/978-3-030-58653-9_50](https://doi.org/10.1007/978-3-030-58653-9_50).
- [14] E. Villagrossi, N. Pedrocchi, and M. Beschi. “Simplify the robot programming through an action-and-skill manipulation framework”. In: vol. 2021-September. cited By 7. 2021. DOI: [10.1109/ETFA45728.2021.9613168](https://doi.org/10.1109/ETFA45728.2021.9613168).
- [15] M. Beschi, M. Faroni, C. Copot, and N. Pedrocchi. “How motion planning affects human factors in human-robot collaboration”. In: vol. 53. 5. cited By 8. 2020, pp. 744–749. DOI: [10.1016/j.ifacol.2021.04.167](https://doi.org/10.1016/j.ifacol.2021.04.167).
- [16] M. Beschi and A. Visioli. “A simple technique to improve the set-point following performance of Predictive Functional Control”. In: vol. 2020-September. cited By 0. 2020, pp. 441–446. DOI: [10.1109/ETFA46521.2020.9211970](https://doi.org/10.1109/ETFA46521.2020.9211970).
- [17] M. Faroni, M. Beschi, S. Ghidini, N. Pedrocchi, A. Umbrico, A. Orlandini, and A. Cesta. “A Layered Control Approach to Human-Aware Task and Motion Planning for Human-Robot Collaboration”. In: cited By 22. 2020, pp. 1204–1210. DOI: [10.1109/RO-MAN47096.2020.9223483](https://doi.org/10.1109/RO-MAN47096.2020.9223483).
- [18] M. Giacomelli, M. Beschi, L. Simoni, and A. Visioli. “A software tool to make primary school students aware of control systems”. In: vol. 53. 2. cited By 2. 2020, pp. 17258–17263. DOI: [10.1016/j.ifacol.2020.12.1801](https://doi.org/10.1016/j.ifacol.2020.12.1801).
- [19] R. Pagani, G. Legnani, G. Incerti, M. Beschi, and M. Tiboni. “The influence of heat exchanges on friction in robotic joints: theoretical modelling, identification and experiments”. In: vol. 10. cited By 1. 2020. DOI: [10.1115/DETC2020-22347](https://doi.org/10.1115/DETC2020-22347).
- [20] F. Vicentini, N. Pedrocchi, M. Beschi, M. Giussani, N. Iannacci, P. Magnoni, S. Pellegrinelli, L. Roveda, E. Villagrossi, M. Askarpour, I. Maurtua, A. Tellaeché, F. Becchi, G. Stellan, and G. Fogliazza. “PIROS: Cooperative, Safe and Reconfigurable Robotic Companion for CNC Pallets Load/Unload Stations”. In: *Springer Tracts in Advanced Robotics* 136 (2020). cited By 29, pp. 57–96. DOI: [10.1007/978-3-030-34507-5_4](https://doi.org/10.1007/978-3-030-34507-5_4).

- [21] M. Faroni, M. Beschi, and N. Pedrocchi. “An MPC Framework for Online Motion Planning in Human-Robot Collaborative Tasks”. In: vol. 2019-September. cited By 20. 2019, pp. 1555–1558. DOI: [10.1109/ETFA.2019.8869047](https://doi.org/10.1109/ETFA.2019.8869047).
- [22] E. Rodriguez-Miranda, M. Beschi, J. Guzman, M. Berenguel, and A. Visioli. “Application of a symmetric-send-on-delta event-based controller for a microalgal raceway reactor”. In: cited By 1. 2019, pp. 3132–3137. DOI: [10.23919/ECC.2019.8795912](https://doi.org/10.23919/ECC.2019.8795912).
- [23] M. Faroni, M. Beschi, and A. Visioli. “Predictive Inverse Kinematics for Redundant Manipulators: Evaluation in Re-Planning Scenarios”. In: vol. 51. 22. cited By 3. 2018, pp. 238–243. DOI: [10.1016/j.ifacol.2018.11.548](https://doi.org/10.1016/j.ifacol.2018.11.548).
- [24] S. Ghidini, M. Beschi, N. Pedrocchi, and A. Visioli. “Robust Tuning Rules for Series Elastic Actuator PID Cascade Controllers”. In: vol. 51. 4. cited By 5. 2018, pp. 220–225. DOI: [10.1016/j.ifacol.2018.06.069](https://doi.org/10.1016/j.ifacol.2018.06.069).
- [25] M. Leonesio, E. Villagrossi, M. Beschi, A. Marini, G. Bianchi, N. Pedrocchi, L. Tosatti, V. Grechishnikov, Y. Ilyukhin, and A. Isaev. “Vibration Analysis of Robotic Milling Tasks”. In: vol. 67. cited By 15. 2018, pp. 262–267. DOI: [10.1016/j.procir.2017.12.210](https://doi.org/10.1016/j.procir.2017.12.210).
- [26] G. Nicola, N. Pedrocchi, S. Mutti, P. Magnoni, and M. Beschi. “Optimal task positioning in multi-robot cells, using nested meta-heuristic swarm algorithms”. In: vol. 72. cited By 8. 2018, pp. 386–391. DOI: [10.1016/j.procir.2018.03.081](https://doi.org/10.1016/j.procir.2018.03.081).
- [27] M. Faroni, M. Beschi, M. Berenguel, and A. Visioli. “Fast MPC with staircase parametrization of the inputs: Continuous input blocking”. In: cited By 10. 2017, pp. 1–8. DOI: [10.1109/ETFA.2017.8247632](https://doi.org/10.1109/ETFA.2017.8247632).
- [28] M. Faroni, M. Beschi, L. Tosatti, and A. Visioli. “A Predictive Approach to Redundancy Resolution for Robot Manipulators”. In: vol. 50. 1. cited By 15. 2017, pp. 8975–8980. DOI: [10.1016/j.ifacol.2017.08.1324](https://doi.org/10.1016/j.ifacol.2017.08.1324).
- [29] L. Merigo, M. Beschi, F. Padula, N. Latronico, M. Paltenghi, and A. Visioli. “Event based control of propofol and remifentanil coadministration during clinical anesthesia”. In: cited By 4. 2017. DOI: [10.1109/EBCCSP.2017.8022832](https://doi.org/10.1109/EBCCSP.2017.8022832).
- [30] L. Merigo, M. Beschi, F. Padulaz, and A. Visioli. “On the tuning of a PIDplus control system with a noise-filtering event generator”. In: cited By 0. 2017, pp. 1–7. DOI: [10.1109/ETFA.2017.8247628](https://doi.org/10.1109/ETFA.2017.8247628).
- [31] L. Simoni, M. Beschi, G. Legnani, and A. Visioli. “On the Inclusion of Temperature in the Friction Model of Industrial Robots”. In: vol. 50. 1. cited By 22. 2017, pp. 3482–3487. DOI: [10.1016/j.ifacol.2017.08.933](https://doi.org/10.1016/j.ifacol.2017.08.933).
- [32] L. Simoni, E. Villagrossi, M. Beschi, A. Marini, N. Pedrocchi, L. Tosatti, G. Legnani, and A. Visioli. “On the use of a temperature based friction model for a virtual force sensor in industrial robot manipulators”. In: cited By 9. 2017, pp. 1–6. DOI: [10.1109/ETFA.2017.8247655](https://doi.org/10.1109/ETFA.2017.8247655).
- [33] M. Faroni, M. Beschi, A. Visioli, and L. Molinari Tosatti. “A global approach to manipulability optimisation for a dual-arm manipulator”. In: vol. 2016-November. cited By 13. 2016. DOI: [10.1109/ETFA.2016.7733725](https://doi.org/10.1109/ETFA.2016.7733725).

- [34] G. Legnani, L. Simoni, M. Beschi, and A. Visioli. “A new friction model for mechanical transmissions considering joint temperature”. In: vol. 6. cited By 9. 2016. DOI: [10.1115/DETC201660523](https://doi.org/10.1115/DETC201660523).
- [35] L. Merigo, M. Beschi, F. Padula, and A. Visioli. “A new event generator for PIPlus control systems”. In: cited By 2. 2016. DOI: [10.1109/EBCCSP.2016.7605264](https://doi.org/10.1109/EBCCSP.2016.7605264).
- [36] L. Simoni, M. Beschi, D. Colombo, and A. Visioli. “Multi-frequency disturbance compensation in a plastic injection molding machine”. In: vol. 2016-November. cited By 0. 2016. DOI: [10.1109/ETFA.2016.7733589](https://doi.org/10.1109/ETFA.2016.7733589).
- [37] M. Beschi, R. Adamini, A. Marini, and A. Visioli. “Using of the Robotic Operating System for PID control education”. In: vol. 48. 29. cited By 10. 2015, pp. 87–92. DOI: [10.1016/j.ifacol.2015.11.218](https://doi.org/10.1016/j.ifacol.2015.11.218).
- [38] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “An Event-based PI controller autotuning technique for integral processes”. In: cited By 8. 2015. DOI: [10.1109/EBCCSP.2015.7300684](https://doi.org/10.1109/EBCCSP.2015.7300684).
- [39] M. Beschi, E. Villagrossi, N. Pedrocchi, and L. Tosatti. “A general analytical procedure for robot dynamic model reduction”. In: vol. 2015-December. cited By 9. 2015, pp. 4127–4132. DOI: [10.1109/IRoS.2015.7353960](https://doi.org/10.1109/IRoS.2015.7353960).
- [40] L. Simoni, M. Beschi, D. Colombo, A. Visioli, and R. Adamini. “A Hardware-In-the-Loop setup for rapid control prototyping of mechatronic systems”. In: vol. 2015-October. cited By 6. 2015. DOI: [10.1109/ETFA.2015.7301628](https://doi.org/10.1109/ETFA.2015.7301628).
- [41] L. Simoni, M. Beschi, G. Legnani, and A. Visioli. “Friction modeling with temperature effects for industrial robot manipulators”. In: vol. 2015-December. cited By 53. 2015, pp. 3524–3529. DOI: [10.1109/IRoS.2015.7353869](https://doi.org/10.1109/IRoS.2015.7353869).
- [42] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “Event-based PI controller with exponential thresholds”. In: vol. 19. cited By 3. 2014, pp. 5766–5771. DOI: [10.3182/20140824-6-za-1003.01052](https://doi.org/10.3182/20140824-6-za-1003.01052).
- [43] M. Beschi, A. Pawlowski, J. Guzmán, M. Berenguel, and A. Visioli. “Symmetric send-on-delta PI control of a greenhouse system”. In: vol. 19. cited By 10. 2014, pp. 4411–4416. DOI: [10.3182/20140824-6-za-1003.01028](https://doi.org/10.3182/20140824-6-za-1003.01028).
- [44] M. Beschi, A. Piazzoli, and A. Visioli. “On the practical implementation of a non-causal feedforward technique for PID control”. In: cited By 4. 2014, pp. 1806–1811. DOI: [10.23919/ecc.2009.7074665](https://doi.org/10.23919/ecc.2009.7074665).
- [45] J. Chacón, M. Beschi, J. Sánchez, A. Visioli, and S. Dormido. “An experimental framework to analyze limit cycles generated by event-based sampling”. In: vol. 19. cited By 5. 2014, pp. 9051–9056. DOI: [10.3182/20140824-6-za-1003.01146](https://doi.org/10.3182/20140824-6-za-1003.01146).
- [46] J. Chacón, M. Beschi, J. Sánchez, A. Visioli, and S. Dormido. “Experimental analysis of a remote event-based PID controller in a flexible link system”. In: cited By 7. 2014. DOI: [10.1109/ETFA.2014.7005068](https://doi.org/10.1109/ETFA.2014.7005068).
- [47] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “An automatic tuning procedure for an event-based PI controller”. In: cited By 11. 2013, pp. 7437–7442. DOI: [10.1109/CDC.2013.6761070](https://doi.org/10.1109/CDC.2013.6761070).

- [48] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “Stability analysis of symmetric send-on-delta event-based control systems”. In: cited By 15. 2013, pp. 1771–1776. DOI: [10.1109/acc.2013.6580092](https://doi.org/10.1109/acc.2013.6580092).
- [49] M. Beschi, A. Visioli, M. Berenguel, and L. Roca. “A feedback linearization-based two-degree-of-freedom constrained controller strategy for a solar furnace”. In: cited By 4. 2013, pp. 3228–3233. DOI: [10.1109/IECON.2013.6699645](https://doi.org/10.1109/IECON.2013.6699645).
- [50] M. Beschi, M. Berenguel, A. Visioli, J. Guzman, and L. Yebra. “A feedback linearization GPC control strategy for a solar furnace”. In: cited By 4. 2012, pp. 2244–2249. DOI: [10.1109/acc.2012.6314819](https://doi.org/10.1109/acc.2012.6314819).
- [51] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “A new two degree-of-freedom event-based PI control strategy”. In: cited By 2. 2012, pp. 2362–2367. DOI: [10.1109/acc.2012.6314821](https://doi.org/10.1109/acc.2012.6314821).
- [52] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “On the stability of an event-based PI controller for FOPDT processes”. In: vol. 2. PART 1. cited By 5. 2012, pp. 436–441. DOI: [10.3182/20120328-3-it-3014.00074](https://doi.org/10.3182/20120328-3-it-3014.00074).
- [53] M. Beschi, S. Dormido, J. Sanchez, and A. Visioli. “Tuning rules for event-based SSOD-PI controllers”. In: cited By 15. 2012, pp. 1073–1078. DOI: [10.1109/MED.2012.6265781](https://doi.org/10.1109/MED.2012.6265781).
- [54] S. Dormido, M. Beschi, J. Sánchez, and A. Visioli. “An interactive software tool for the study of event-based PI controller”. In: vol. 2. PART 1. cited By 6. 2012, pp. 164–169. DOI: [10.3182/20120328-3-it-3014.00028](https://doi.org/10.3182/20120328-3-it-3014.00028).
- [55] M. Beschi, M. Berenguel, A. Visioli, and L. Yebra. “Control strategies for disturbance rejection in a solar furnace”. In: vol. 44. 1 PART 1. cited By 7. 2011, pp. 12243–12248. DOI: [10.3182/20110828-6-IT-1002.01569](https://doi.org/10.3182/20110828-6-IT-1002.01569).
- [56] M. Beschi, A. Visioli, S. Dormido, and J. Sanchez. “On the presence of equilibrium points in PI control systems with send-on-delta sampling”. In: cited By 19. 2011, pp. 7843–7848. DOI: [10.1109/CDC.2011.6160318](https://doi.org/10.1109/CDC.2011.6160318).