Durgesh Haribhau Salunkhe

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Robotics researcher with a PhD in Robotics, experienced in motion planning, kinematics, and optimization methodologies, seeking opportunities in robotic mechanism design and AI-driven motion planning.

Summary

- PhD in robotics, postdoc in learning algorithms
- Collaboration with industry and academic labs
- Publications with high h-index
- Professional experience in product development
- Completed 3 international research projects
- Mentored multiple international students

Education

Nov '23 — **PhD in Robotics, CNRS**
Cuspidal robots : Analysis, classification and application of 6R cuspidal serial robots
Advisors: Philippe Wenger, Damien Chablat

Sep '20 — **MS, Ecole Centrale de Nantes (ECN)**
Robotics Engineering - Erasmus Mundus
Master thesis: Optimal design of a robot mechanism for otological surgery
Advisor: Damien Chablat, Marcello Sanguineti

Sep '19 — **MS, University of Genova (UNIGE)**
Robotics Engineering - Erasmus Mundus
Student Representative in Council of study courses

Professional Experience

Apr '24 – Current — **Ecole Polytechnique Féderale de Lausanne (EPFL)**
Postdoctoral Researcher
- Working on analysis and path planning of generic 7R robots
- Collaborated with internal members on topics of Robot Learning using Dynamical Systems and Transfer Learning framework
- Collaborated with external members on topics of Algebraic Topology and Geometric Algebra

Jan '24 – Mar '24 — **Centre National de Recherche Scientifique (CNRS)**
Research Engineer
- Developed algorithms for path planning of generic 6R robots making them safer and versatile.
- Worked on analysis of generic 6R cuspidal robots

Oct '17 – May '18 — **Indian Institute of Technology (IIT), Jodhpur**
Junior Research Fellow, Robotics Laboratory
- Developed full-body sensorless active compliant 6dof parallel mechanism
- Collaborated with DFKI GmBh for an architecture of dynamic analysis
- Derived a kinematic solution for multi-agent payload manipulation for scalabililty

Aug '16 – Sep '17 — **Grey Orange Robotics, Gurugram, India**
Mechanical Engineer
- Developed mechanism for package sortation system to increase speed by 30% and payload capacity by 20%

Invited talks

- **Summer school** on Singularities in Mechanisms & Robotic manipulators @ Nantes
- **Special Semester** on Kinematic Aspects of Robotics @ Linz, Austria
- **Lecture** on dangers of cuspidal robots in collaborative application @ EPFL, Switzerland
- **Lecture** on Levaraging kinematic analysis to generalize robot behavior and transfer learning @ CNRS ICube, Strasbourg
- **Lecture** on Embedding kinematic intelligence for robust learning from demonstration and explainable transfer @ CNRS LAAS, Toulouse

Research projects

- NExT (Nantes Excellence Trajectory for Health and Engineering) Initiative and the Human Factors for Medical Technologies (**FAME**)
- Efficient and Certified Robot Motion Planning (**ECARP**) ANR-19-CE48-0015
- EU project - Dynamic Agile Production Robots that Learn and optimise knowledge and operations (**DARKO**)

Scholarships

- Erasmus Mundus Consortium Scholarship, **EMARO+**, 2018-20
- Invest Your talent in Italy (**IYT**), 2019

Technical Skills

- **Maple** - Professional experience
- **Python** - Professional experience
- **CATIA** - Academic projects
- **MATLAB** - Academic projects
- **C, C++** - Academic projects

Soft skills

- Quick learner
- Adaptable
- Result oriented
- Leadership
- Mentorship
- Management

List of selected publications

Journal articles

Dec ’25 | **Demonstrate Once, Execute on Many: Kinematic Intelligence for Cross-robot Skill Transfer**
Gupta Sthithpragya*, Salunkhe, Durgesh Haribhau*, Billard, Aude (* Equal contribution)
Science Robotics (Science),
In Second round of review

Jun ’25 | **Cuspidal redundant robots: classification of infinitely many IKS of special classes of 7R robots**
Salunkhe, Durgesh Haribhau, Gupta Sthithpragya, Billard, Aude
Robotics and Automation Letters (RA-L),
https://doi.org/10.1109/LRA.2025.3623011

Sep ’24 | **Kinematic issues in 6R cuspidal robots, guidelines for path planning and deciding cuspidality**
Salunkhe, Durgesh Haribhau, Marauli, Tobias, Mueller, Andreas, Chablat, Damien and Wenger, Philippe
International Journal of Robotics Research (IJRR),
https://doi.org/10.1177/02783649241293481

Jan ’22 | **Necessary & sufficient condition for generic 3R serial robot to be cuspidal**
Salunkhe, Durgesh Haribhau, Spartalis, Christoforos, Capco, Jose, Chablat, Damien, Wenger, Philippe
International Journal on Mechanism and Machine Theory (MMT),
https://doi.org/10.1016/j.mechmachtheory.2022.104729

Jul ’22 | **An efficient combined local and global search strategy for optimization of parallel kinematic mechanisms with joint limits and collision constraints**
Salunkhe, Durgesh Haribhau, Michel, Guillaume, Kumar, Shivesh, Chablat, Damien
International Journal on Mechanism and Machine Theory (MMT),
https://doi.org/10.1016/j.mechmachtheory.2022.104796

Aug’21 | **Literature Review on Endoscopic Robotic Systems in Ear and Sinus Surgery**
Michel, Guillaume, Salunkhe, Durgesh Haribhau, Bordure, Philippehilippe, Chablat, Damien
Journal of Medical Devices, American Society of Mechanical Engineers (ASME),
https://doi.org/10.1115/1.4052516

Mar ’21 | **Geometric atlas of the middle ear and paranasal sinuses for robotic applications**
Michel, Guillaume, Salunkhe, Durgesh Haribhau, Chablat, Damien, Bordure, Philippehilippe
International journal on Surgical Innovation, (SI),
https://doi.org/10.1177/15533506211039675

May ’19 | **Sensorless full body active compliance in a 6 DOF parallel manipulator**
Dutta Anirvan, Salunkhe, Durgesh Haribhau, Kumar, Shivesh, Udai, Arun Dayal & Shah, Suril
Robotics and Computer-Integrated Manufacturing, (RCIM), Volume 59,
https://doi.org/10.1016/j.rcim.2019.04.010

Conference proceedings

Jun ’25 | **Kinematic and static analyses of the spherical X-joint, a new cable-driven spherical 4R linkage**
Muralidharan, Vimalesh, Salunkhe, Durgesh Haribhau, Wenger, Philippe, Chevallereau, Christine
International Conference on Computational Kinematics (CK), 2025,
Accepted on 26 Jul 2025

Apr ’25 | **Geometric analysis of generic 3R robots, and necessary and sufficient conditions for a class of orthogonal robots to have four IKS**
Salunkhe, Durgesh Haribhau, Nayak, Abhilash
International Conference on Mathematics and its Applications (IMA), 2025,
Accepted on 25 Apr 2025

Apr ’25 | **Inverse kinematic solution for generic 3R positional robots using Conformal Geometric Algebra**
Nayak, Abhilash, Salunkhe, Durgesh Haribhau
International Conference on Mathematics and its Applications (IMA), 2025,
Accepted on 25 Apr 2025

Jul ’23 | **Time-Optimal Point-To-Point Motion Planning and Assembly Mode Change of Cuspidal Manipulators: Application to 3R and 6R Robots**
Marauli, Tobias, Salunkhe, Durgesh Haribhau, Mueller, Andreas, Chablat, Damien and Wenger, Philippe
International Conference on Intelligent Robots and Systems (IROS), 2023,
https://doi.org/10.1109/IROS55552.2023.10341420

May ’23 | **Trajectory planning problems in commercial cuspidal robots**
Salunkhe, Durgesh Haribhau, Chablat, Damien and Wenger. P
International Conference on Robotics and Automation (ICRA), 2023,
https://doi.org/10.1109/ICRA48891.2023.10161444

Jul ’22 | **Geometry based analysis of 3R serial robot**
Salunkhe, Durgesh Haribhau, Capco. J, Chablat, Damien and Wenger. P
International Conference on Advances in Robot Kinematics (ARK), 2022,
https://doi.org/10.1007/978-3-031-08140-8_8

May ’22 | **Design optimization of a parallel manipulator for otological surgery**
Salunkhe, Durgesh Haribhau, Michel, Guillaume, Kumar, Shivesh, Olivier, E., Sanguineti, Marcello, Chablat, Damien
New frontiers of parallel robotics, workshop of International Conference on Robotics and Automation (ICRA), 2022,
hal-03757437

May ’22 | **Deciding cuspidality of manipulators through computer algebra and algorithms in real algebraic geometry**
Chablat, Damien, Prebet. Rémi, Safey El Din. M, Salunkhe, Durgesh Haribhau and Wenger. P (authors ordering is alphabetical)
International Symposium on Symbolic and Algebraic Computation (ISSAC), 2022,
https://doi.org/10.1145/3476446.3535477

Jun ’20 | **A new RCM mechanism for an ear and facial surgical application**
Michel, Guillaume, Salunkhe, Durgesh Haribhau, Chablat, Damien, Bordure, Philippe-hilippe
International Conference on Robotics in Alpe-Adria Danube Region (RAAD), 2020, https://doi.org/10.1007/978-3-030-48989-2_44

Aug ’19 | **Motion planning for multi-mobile-manipulator payload transport systems**
Talamraju. R, Salunkhe, Durgesh Haribhau, Rajappa, Sujit, Ahmad Aamir, Karlapalem Kamalakar, Shah Suril
International Conference on Automation Science and Engineering (CASE), 2019, https://doi.org/10.1109/COASE.2019.8842840

Jun ’17 | **Force/position control of 3 dof delta manipulator with voice coil actuator**
Udai Arun Dayal, Salunkhe, Durgesh Haribhau, Dutta Anirvan, Mukherjee, Sudipto
Proceedings of International conference on Advances in Robotics (AIR), 2017, https://doi.org/10.1145/3132446.3134897

Dec ’16 | **Design, trajectory generation and control of quadrotor research platform**
Salunkhe, Durgesh Haribhau, Sharma Siddhant, Topno Sujal, Darapaneni Chandana, Kankane Amol, Shah Suril
International Conference on Robotics and Automation for Humanitarian Applications (RAHA), https://doi.org/10.1109/RAHA.2016.7931876