



# Durgesh Haribhau Salunkhe

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*I believe in approaching a problem from its foundation and achieving excellence through exploring unconventional yet efficient solutions.*

## Applying for: Postdoctoral Opportunities

- PhD in robotics
- Collaboration with industry and academic labs
- Publications with high h-index
- Professional experience in product development
- Completed 3 international research projects
- Representative in International Study Council

## Education

- Nov '24 | **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**  
Robotics Engineering - Erasmus Mundus  
Master thesis: [Optimal design of a robot mechanism for otological surgery](#)
- Sep '19 | **MS, University of Genova**  
Robotics Engineering - Erasmus Mundus  
Student Representative in Council of study courses

## Professional Experience

- Apr '24 | **Ecole Polytechnique Fédérale de Lausanne**  
Current | **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 | **Centre National de Recherche Scientifique**  
Mar '24 | **Research Engineer**
- Developed algorithms for path planning of generic 6R robots
  - Worked on analysis of generic 6R robots that are cuspidal
- Oct '17 | **Indian Institute of Technology, Jodhpur**  
May '18 | **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 scalability

## 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

## 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, FWF I4452-N
- 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, 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

- Sep '24 | **Kinematic issues in 6R cuspidal robots, guidelines for path planning and deciding cuspidality**  
Salunkhe, D.H., Marauli, T., Mueller, A., Chablat, D. and Wenger, P.  
International Journal of Robotics Research (**IJRR**)
- Jan '22 | **Necessary & sufficient condition for generic 3R serial robot to be cuspidal**  
Salunkhe, D.H., Spartalis, C., Capco, J., Chablat, D., Wenger, P.  
International Journal on Mechanism and Machine Theory (**MMT**)
- Jul '22 | **An efficient combined local and global search strategy for optimization of parallel kinematic mechanisms with joint limits and collision constraints**  
Salunkhe, D.H., Michel. G, Kumar, S., Chablat, D.  
International Journal on Mechanism and Machine Theory (**MMT**)
- Aug'21 | **Literature Review on Endoscopic Robotic Systems in Ear and Sinus Surgery**  
Michel. G, Salunkhe, D.H., Bordure. P, Chablat. D  
Journal of Medical Devices, American Society of Mechanical Engineers (**ASME**),
- Mar '21 | **Geometric atlas of the middle ear and paranasal sinuses for robotic applications**  
Michel. G, Salunkhe, D.H., Chablat. D, Bordure. P  
International journal on Surgical Innovation, (**SI**)
- May '19 | **Sensorless full body active compliance in a 6 DOF parallel manipulator**  
Dutta, A., Salunkhe, D.H., Kumar, S., Udai, A.D. & Shah, S. V  
Robotics and Computer-Integrated Manufacturing, (**RCIM**), Volume 59

## Conference proceedings

- Jul '23 | **Time-Optimal Point-To-Point Motion Planning and Assembly Mode Change of Cuspidal Manipulators: Application to 3R and 6R Robots**  
Marauli, T., Salunkhe, D.H., Mueller, A., Chablat, D. and Wenger, P.  
International Conference on Intelligent Robots and Systems (**IROS**), 2023
- May '23 | **Trajectory planning problems in commercial cuspidal robots**  
Salunkhe, D.H., Chablat. D and Wenger. P  
International Conference on Robotics and Automation (**ICRA**), 2023
- Jul '22 | **Geometry based analysis of 3R serial robot**  
Salunkhe, D.H., Capco. J, Chablat. D and Wenger. P  
International Conference on Advances in Robot Kinematics (**ARK**), 2022
- May '22 | **Design optimization of a parallel manipulator for otological surgery**  
Salunkhe, D.H., Michel, G., Kumar, S., Olivier, E., Sanguinetti, M., Chablat, D.  
New frontiers of parallel robotics, workshop of International Conference on Robotics and Automation (**ICRA**), 2022
- May '22 | **Deciding cuspidality of manipulators through computer algebra and algorithms in real algebraic geometry**  
Chablat. D, Prebet. R, Safey El Din. M, Salunkhe, D.H. and Wenger. P (authors ordering is alphabetical)  
International Symposium on Symbolic and Algebraic Computation (**ISSAC**), 2022
- Jun '20 | **A new RCM mechanism for an ear and facial surgical application**  
Michel. G, Salunkhe, D.H., Chablat. D, Bordure. P  
International Conference on Robotics in Alpe-Adria Danube Region (**RAAD**), 2020
- Aug '19 | **Motion planning for multi-mobile-manipulator payload transport systems**  
Tallamraju. R, Salunkhe, D.H., Rajappa. S, Ahmad. A, Karlapalem. K, Shah. S  
International Conference on Automation Science and Engineering (**CASE**), 2019
- Dec '16 | **Design, trajectory generation and control of quadrotor research platform**  
Salunkhe, D.H., Sharma. S, Topno. S. A, Darapaneni. C, Kankane. A, Shah. S  
International Conference on Robotics and Automation for Humanitarian Applications