

## R. Praveen Jain

Postdoctoral researcher, Department of Engineering Cybernetics,  
Norwegian University of Science and Technology,  
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**Gender:** Male

**Date of Birth:** 19 December 1988

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### Research Areas

Marine and Aerial Robotic Systems, Distributed Control, Event and Self-triggered Control, Model Predictive Control, Nonlinear Control, Probabilistic Machine Learning.

### Education

Feb 2016 - July 2019	Doctor of Philosophy, Electrical and Computer Engineering University of Porto, Faculty of Engineering, Portugal <i>PhD Thesis: Decentralized Cooperative Control Methods for Multiple Mobile Robotic Vehicles</i>
Sep 2013 - Aug 2015	Master of Science, Systems and Control Technical University of Delft, The Netherlands <i>MSc Thesis: Transportation of Cable Suspended Loads using Unmanned Aerial Vehicles: A Real-time Model Predictive Control Approach</i>
Aug 2006 - June 2010	Bachelor of Engineering, Electronics and Communication Nitte Meenakshi Institute of Technology, Bengaluru, India <i>BE Project: Forward and Inverse Kinematics, Trajectory Planning and Control of 5 DOF Articulated Robot for Pick and Place operation</i>

### Professional Experience

Oct 2020 - present	Postdoctoral Researcher Department of Engineering Cybernetics Norwegian University of Science and Technology, Norway <i>Research Topic: Situational Awareness and Collision Avoidance Systems for Autonomous Ships</i>
Oct 2019 - Sep 2020	ERCIM Postdoctoral Researcher Department of Engineering Cybernetics Norwegian University of Science and Technology, Norway <i>Research Topic: Adaptive sampling methods for robotic mapping of spatial fields</i>
Dec 2015 - Sep 2019	Marie Skłodowska-Curie Researcher Cyber-Physical Control Systems and Robotics Lab Faculty of Engineering, University of Porto, Portugal <i>Research Topic: Event-triggered cooperative control methods for marine</i>

## *robotic vehicles*

Sep 2017 - Nov 2017	Visiting Researcher Department of Engineering Cybernetics Norwegian University of Science and Technology, Norway <i>Research Topic: Kalman Filter based methods for localization of acoustic fish-tags using Time-of-Arrival measurements</i>
July 2010 - June 2013	Research Associate and Team Leader Center for Robotics Research Nitte Meenakshi Institute of Technology, Bengaluru, India <i>Research Topic: Control of robotic manipulators and wheeled robots.</i>

## **Publications**

### ***Journal Publications***

1. R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Three Dimensional Moving Path Following Control for Robotic Vehicles with Minimum Positive Forward Speed.*" IEEE Control Systems Letters (2021).
2. Matheus Reis, R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Robust Cooperative Moving Path Following for Marine Robotic Vehicles*", Frontiers in Robotics and AI, 2019.
3. Matheus Reis, R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Robust Moving Path Following Control for Robotic Vehicles: Theory and Experiments*", IEEE Robotics and Automation Letters, 2019.
4. R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Cooperative Path Following of Robotic Vehicles using an Event based Control and Communication Strategy*", IEEE Robotics and Automation Letters, vol. 3, no. 3, pp. 1941-1948, July 2018.
5. Jharna Majumdar, R. Praveen Jain, Venkatesh G. M. and Swaroop R, "*Intelligent Computer Vision System for Door Sensing Mobile Robot*", IAES International Journal of Robotics and Automation, vol. 1, (4), pp. 190, 2012.

### ***Conference Publications***

1. R. Praveen Jain, Edmund F. Brekke, Adil Rasheed, "*Unsupervised Clustering of Marine Vessel Trajectories in Historical AIS Database*", 25th International Conference on Information Fusion, 2022.
2. Yaolin Ge, Andre Olaisen, Jo Eidsvik, R. Praveen Jain, Tor Arne Johansen, "*Long-Horizon Informative Path Planning with Obstacles and Time Constraints*", 14th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles, 2022.
3. R. Praveen Jain, A. Pedro Aguiar, and João Borges de Sousa, "*Target Tracking using an Autonomous Underwater Vehicle: A Moving Path Following Approach*", 2018 IEEE OES

Autonomous Underwater Vehicle Symposium, Porto, November 2018.

4. R. Praveen Jain, A. Zolich, E. Erstorp, Tor Arne Johansen, Jo Arve Alfredsen, A. Pedro Aguiar, Jakob Kuttenkeuler and João Borges de Sousa, "*Localization of an Acoustic Fish-Tag using the Time-of-Arrival Measurements: Preliminary results using exogenous Kalman Filter*", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Madrid, October 2018.
5. R. Praveen Jain, Andrea Alessandretti, A. Pedro Aguiar and João Borges de Sousa, "*Cooperative Moving Path Following using Event based Control and Communication*", 13th APCA International Conference on Automatic Control and Soft Computing, Azores, Portugal, June 2018.
6. R. Praveen Jain, Andrea Alessandretti, A. Pedro Aguiar and João Borges de Sousa, "*Moving Path Following of Constrained Underactuated Systems: A Nonlinear Model Predictive Control Approach*", 2018 AIAA Information Systems, AIAA SciTech Forum, Florida, January 2018.
7. R. Praveen Jain, Andrea Alessandretti, A. Pedro Aguiar and João Borges de Sousa, "*A Nonlinear Model Predictive Control for an AUV to Track and Estimate a Moving Target using Range Measurements*", ROBOT 2017 - Third Iberian Robotics Conference, Seville, Spain, November 2017.
8. Juan Braga, R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Self-triggered Time Coordinated Deployment Strategy for Multiple Relay UAVs to Work as a Point-To-Point Communication Bridge*", 2017 Workshop on Research, Education and Development of Unmanned Aerial Systems (RED-UAS), Linkoping, 2017.
9. R. Praveen Jain, A. Pedro Aguiar and João Borges de Sousa, "*Self-triggered Cooperative Path Following Control of Fixed Wing Unmanned Aerial Vehicles*", 2017 International Conference on Unmanned Aircraft Systems (ICUAS), Miami, FL, USA, 2017.

**Unpublished / Under preparation**

1. R. Praveen Jain, Edmund F. Brekke, Adil Rasheed, "*Particle Filter methods for Vessel Trajectory Prediction using Historical AIS Data*", under preparation.
2. R. Praveen Jain, Jo Eidsvik and Tor Arne Johansen "*An Online RRT-based method for Adaptive Robotic Sampling of Hot-spots in Spatial Fields*", work to be extended.
3. R. Praveen Jain, Antonio Pedro Aguiar, João Borges de Sousa, "*Cooperative Moving Path Following using Dynamic Event-triggered Control and Communication*".

## Technical Skills

<b>Hardware</b>	Digilent Nexys2 Spartan 3E and Atlys Spartan 6 FPGA development board, ATmega series and 8051 8-bit Microcontrollers, mBed kit with LPC1768 ARM Cortex M3. (Skills acquired prior to master studies)
<b>Software Programming Skills</b>	Matlab, Python, C, C++
<b>Others</b>	DUNE AUV control software, Paparazzi UAV control software.

## Professional Service

### **Technical Manuscript Reviewer**

**Journals** - Automatica, IEEE Journal of Ocean Engineering, IEEE Transactions on Cybernetics, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Vehicular Technology, IEEE Transactions on Aerospace and Electronic Systems.

**Conferences** - IEEE International Conference on Robotics and Automation, IEEE/RSJ International Conference on Intelligent Robots and Systems, IEEE International Conference on Decision and Control (CDC), International Conference on Unmanned Aircraft Systems, IEEE OES Autonomous Underwater Vehicle Symposium, Iberian Robotics Conference, Workshop on Research, Education and Development of Unmanned Aerial Systems (RED-UAS).

## Personal Skills and Competencies

<b>Languages</b>	English, Hindi, Kannada, Marathi, Norsk (A2/B1)
<b>Skills</b>	<ul style="list-style-type: none"><li>- Effective team player, experience working with student groups.</li><li>- Experience with conducting independent research.</li><li>- Focused and enjoy responsibilities.</li></ul>