

Ramviyas Nattanmai Parasuraman

Assistant Professor, Department of Computer Science
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👤 Personal Statement

- I conduct research on networked robotics control, communication, and coordination aspects.
- I'm more of an experimentalist and love to do hands-on real-world implementations, grounded on strong theoretical framework.
- My vision is to capacitate autonomous heterogeneous robotic vehicles with intelligent, resilient and robust coordination mechanisms through devising advanced communication and wireless sensing methods.

❤️ Research Interests

- › Networked Multi-Robot Systems
- › Robot Sensing and Communication
- › Robotics in Nuclear Facilities
- › Machine Learning of Wireless Signals
- › Human-Robot Interaction/Interfaces
- › Intelligent Teleoperation
- › Search, Rescue, and Field Robotics

🎓 Education

- Nov 2011 – Oct 2014 [Ph.D. in Robotics and Automation \(with "Outstanding" and "International Doctorate" mentions\)](#)
UPM - Universidad Politécnica de Madrid (Technical University of Madrid), Madrid, Spain
- Jul 2008 – May 2010 [Masters of Technology \(M.Tech\) in Instrument Technology](#)
IIT-D - Indian Institute of Technology Delhi, New Delhi, India
- Mar 2010–May 2010 [M.Sc. Exchange Student](#)
EPFL - École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland
- Aug 2004 – May 2008 [Bachelor of Engineering \(B.E\) in Electronics and Instrumentation](#)
TCE - Thiagarajar College of Engineering (Anna University), Madurai, India

📁 Work Experience

- Present** | **Assistant Professor, UGA, Athens, GA, USA**
Aug 2018
› Involved in the research, teaching, and supervision in the Department of Computer Science at UGA.
› Directing the Heterogeneous Robotics (*HeRo*) Research Lab at UGA.
[Heterogeneous Robots](#) [Multi-Robot Systems](#) [Networked Robots](#) [Nuclear Robotics](#)
- Jul 2018** | **Postdoctoral Research Associate, Purdue University, West Lafayette, USA**
Oct 2016
› Involved in the research, teaching, and mentoring activities in the SMART lab with Prof. Byung-Cheol Min.
› Contributing to the NSF/RoSeHub project.
› Performed independent research in Networked Robots and Assistive Technologies.
[Networked Robots](#) [Multi-Robot Coordination](#) [Consensus/Rendezvous](#) [Unmanned Surface Vehicles](#)
- Sep 2016** | **Postdoctoral Researcher and Teacher, KTH Royal Institute of Technology, Stockholm, Sweden**
Oct 2014
› Performed research in robust communications for field robots with Prof. Petter Ögren.
› Teacher and Course Responsible for the course EL2310 - Scientific Programming (Fall 2015, Fall 2015).
› Supervised masters students and mentored Ph.D. students.
› Involved in two European research projects (EU-FP7) TRADR and RECONFIG.
[Machine Learning](#) [Urban Search and Rescue Robots \(USAR\)](#) [Intelligent Teleoperation](#) [Human-Robot Interfaces](#)
- Jul 2014** | **Fellow (Researcher), CERN - European Organization for Nuclear Research, Geneva, Switzerland**
Aug 2011
› Conducted research in wireless communications for mobile robots used in autonomous radiation survey at CERN facilities such as the Large Hadron Collider (LHC).
› Involved in an EU doctoral research training network (EU-FP7) PURESAFE, supervised by Prof. Manuel Ferre.
› Lead a project in developing an energy management system for a robotic train in the LHC and SPS facilities.
[Robots in Nuclear/Scientific Facilities](#) [Wireless Communications](#) [Relay Robots](#) [Teleoperation Interface](#)
- May 2011** | **Associate Applications Engineer, Oracle Corp., Bangalore, India**
Jul 2010
› Applications developer in the Peoplesoft Human Resource Management Systems (HRMS) group.
[Peoplesoft Tools](#) [Oracle SQL](#) [Human Capital Management \(HCM\)](#)

Funding/Grants Awarded

- Cloud Platform **Education Grant** from Google (2019).
- UGA-University of Liverpool **Faculty Research Exchange** Visit Grant (2019).
- Postdoctoral **Travel Grant**, Purdue University (2017, 2018).
- **Marie-Curie** Early State Research Fellowship Grant (20011-2014).

Panelist: NSF Review Panel Member (2018).

List of Publications

[Link to my Google Scholar profile.](#)

Journal Papers

- [1] Ramvijas Parasuraman, Jonghoek Kim, Shaocheng Luo, and Byung-Cheol Min. “Multipoint Rendezvous in Multirobot Systems.” In: *IEEE Transactions on Cybernetics* (2019). In Press. [Link to Paper](#). [Watch a video presentation](#).
- [2] Michele Colledanchise, Ramvijas Parasuraman, and Petter Ögren. “Learning of Behavior Trees for Autonomous Agents.” In: *Transactions on Games* (2019). In Press. [Link to Paper](#). [Watch a video demonstration](#).
- [3] Jonghoek Kim, Shaocheng Luo, Ramvijas Parasuraman, Jun Han Bae, Eric T Matson, and Byung-Cheol Min. “Multi-robot Rendezvous Based on Bearing-aided Hierarchical Tracking of Network Topology.” In: *Adhoc Networks* 86 (Apr. 2019), pp. 131–143. [Link to Paper](#). [Watch a video demonstration](#).
- [4] Danilo Tardioli, Ramvijas Parasuraman, and Petter Ögren. “Pound: A multi-master ROS node for Reducing Delay and Jitter in Wireless Multi-Robot Networks.” In: *Robotics and Autonomous Systems* 111 (Jan. 2019), pp. 73–87. [Link to Paper](#). [Download Source Codes](#).
- [5] Mohamed Haseeb and Ramvijas Parasuraman. “Wisture: Touch-less Hand Gesture Classification in Unmodified Smartphones Using Wi-Fi Signals.” In: *IEEE Sensors* 19.1 (Jan. 2019). [Link to Paper](#). [Download Source Codes](#). [Watch a video demonstration](#).
- [6] Ramvijas Parasuraman and Byung-Cheol Min. “Special issue on Assistive Robotics (Editorial).” In: *Technologies* 6.4 (Oct. 2018). [Link to Paper](#).
- [7] Byung-Cheol Min, Ramvijas Parasuraman, Sangjun Lee, Jin-Woo Jung, and Eric T Matson. “A Directional Antenna based Leader-Follower Relay System for End-to-End Robot Communications.” In: *Robotics and Autonomous Systems* 101 (2018), pp. 57–73. [Link to Paper](#). [Watch a video demonstration](#).
- [8] Ramvijas Parasuraman, Sergio Caccamo, Fredrik Båberg, Petter Ögren, and Mark Neerincx. “A New UGV Teleoperation Interface for Improved Awareness of Network Connectivity and Physical Surroundings.” In: *Journal of Human Robot Interaction (Transactions on Human Robot Interaction)* 6.3 (Dec. 2017), pp. 48–70. [Link to Paper](#).
- [9] Ramvijas Parasuraman, Thomas Fabry, Luca Molinari, Keith Kershaw, Mario Di Castro, Alessandro Masi, and Manuel Ferre. “A multi-sensor RSS spatial sensing-based robust stochastic optimization algorithm for enhanced wireless tethering.” In: *Sensors* 14.12 (2014), pp. 23970–24003. [Link to Paper](#).
- [10] Ramvijas Parasuraman, Keith Kershaw, and Manuel Ferre. “Experimental investigation of radio signal propagation in scientific facilities for telerobotic applications.” In: *Int. J. of Advanced Robotic Systems* 10.10:364 (2013), pp. 1–11. [Link to Paper](#).

Conference/Workshop Papers (Proceedings)

- [11] Ramvijas Parasuraman and Byung-Cheol Min. “A Weighted Bearing Consensus Controller for Coordinate-free Multi-Robot Rendezvous using Direction of Arrival of Wireless Signals.” In: *Int. Symp. on Distributed Autonomous Robotic Systems (DARS)*. (Boulder, CO, USA). Oct. 2018. [Download Preprint](#). [Watch a video presentation](#). [Download Source Codes](#).
- [12] Petter Ögren Ramvijas Parasuraman and Byung-Cheol Min. “Kalman filter based spatial prediction of wireless connectivity for autonomous robots and connected vehicles.” In: *IEEE Connected and Automated Vehicles Symposium (CAVS)*. (Chicago, IL, USA). Aug. 2018. [Download Preprint](#).
- [13] Yeonju Oh, Ramvijas Parasuraman, Tim McGraw, and Byung-Cheol Min. “360 VR Based Robot Teleoperation Interface for Virtual Tour.” In: *International Workshop on Virtual, Augmented and Mixed Reality for Human-Robot Interaction*. (Chicago, IL, USA). Human-Robot Interaction Conference. Mar. 2018. [Download Paper](#).
- [14] Sergio Caccamo, Ramvijas Parasuraman, Luigi Freda, Mario Gianni, and Petter Ögren. “RCAMP: A Resilient Communication-Aware Motion Planner for Mobile Robots with Autonomous Repair of Wireless Connectivity.” In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2017, pp. 2010–2017. [Download Paper](#). [Watch a Video Demonstration](#).
- [15] Sergio Caccamo, Ramvijas Parasuraman, Fredrik Båberg, and Petter Ögren. “Extending a UGV teleoperation FLC interface with wireless network connectivity information.” In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2015, pp. 4305–4312. [Download Paper](#). [Watch a Video Demonstration](#).
- [16] Ramvijas Parasuraman, Prithvi Pagala, Keith Kershaw, and Manuel Ferre. “Model Based On-Line Energy Prediction System for Semi-Autonomous Mobile Robots.” In: *International Conference on Intelligent Systems Modelling & Simulation (ISMS), Langkawi, Malaysia*. Vol. 5. ISBN 978-1-4799-3857-5. IEEE. 2014, pp. 411–416. [Download Paper](#).

- [17] Alexander Owen-Hill, Ramviyas Parasuraman, and Manuel Ferre. “Haptic teleoperation of mobile robots for augmentation of operator perception in environments with low-wireless signal.” In: *IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)*. 2013, pp. 2374–3247. Download Paper.
- [18] Ramviyas Parasuraman, Thomas Fabry, Keith Kershaw, and Manuel Ferre. “Spatial sampling methods for improved communication for wireless relay robots.” In: *IEEE International Conference on Connected Vehicles and Expo (ICCVE)*. 2013, pp. 874–880. Download Paper.
- [19] Ramviyas Parasuraman, Prithvi Pagala, Keith Kershaw, and Manuel Ferre. “Energy management module for mobile robots in hostile environments.” In: *Towards Autonomous Robotic Systems (TAROS)*. Springer Berlin Heidelberg. 2012, pp. 430–431. Download Paper.
- [20] Abhisekh Jain, Arvind Seshadhri, Balaji BS, and Ramviyas Parasuraman. “Onboard Dynamic Rail Track Safety Monitoring System.” In: *International Conference on Advanced Communication Systems*. Coimbatore, India. 2007. Download Paper.

Extended Abstracts/Posters (Refereed)

- [21] Wonse Jo, Shyam Sundar Kannan, Ramviyas Parasuraman, and Byung-Cheol Min. “Development of Material Recognition Training System for Visually Impaired People.” In: *Health and Disease: Science, Technology, Culture and Policy*. (West Lafayette, IN, USA). Purdue University. Mar. 2018. Download Poster.
- [22] Ramviyas Parasuraman, Jonghoek Kim, Shaocheng Luo, and Byung-Cheol Min. “Hierarchical Tracking-based Multi-Point Rendezvous in Multi-Robot System.” In: *Robots and Sensors for the Human Well-being (ROSE-HUB) Fall Meeting*. (Denver, CO, USA). NSF. Nov. 2017. Download Poster.
- [23] Jun-Han Bae, Ramviyas Parasuraman, Wonse Jo, Arabinda Samantaray, Jee-Hwan Park, Hunjung Lim, and Byung-Cheol Min. “Development of Autonomous Robotic System for Algae Removal.” In: *4th Annual Environmental Community Mixer*. (West Lafayette, USA). Purdue Discovery Park. Sept. 2017. Download Poster.
- [24] Ramviyas Parasuraman, Sergio Caccamo, Luigi Freda, Mario Gianni, Petter Ögren, and Byung-Cheol Min. “An Approach to Retrieve from Communication Loss in Field Robots.” In: *Workshop on Robot Communication in the Wild: Meeting the Challenges of Real-world Systems*. (Boston, USA). Robotics Science and Systems (RSS) Conference. July 2017. Download Paper.
- [25] Danilo Tardioli, Ramviyas Parasuraman, Petter Ögren, and Byung-Cheol Min. “Pound: A multi-core ROS Node to Improve Wireless Communication Performance in Networked Robots.” In: *Workshop on Robot Communication in the Wild: Meeting the Challenges of Real-world Systems*. (Boston, USA). RSS Conference. July 2017. Download Paper.
- [26] Shaocheng Luo, Ramviyas Parasuraman, Jun Han Bae, Sangjun Lee, Jonghoek Kim, and Byung-Cheol Min. “Multi-Robot Rendezvous Control and Optimization.” In: *Midwest Robotics Workshop (MWRW)*. (Chicago, USA). May 2017. Download Poster.
- [27] Ramviyas Parasuraman, Luca Molinari, Mario Di Castro, Keith Kershaw, and Alessandro Masi. “A Fast Radio Signal Strength Prediction Algorithm for Mobile Robots in Unknown Environments.” In: *Workshop on Communication Aware Robotics: New Tools for Multi-Robot Networks, Autonomous Vehicles, and Localization (CarNet)*. (UC Berkeley, USA). Robotics Science and Systems (RSS) Conference. July 2014. Download Extended Abstract.
- [28] Ramviyas Parasuraman, Keith Kershaw, and Manuel Ferre. “A study on wireless communication for mobile robots in hostile environments.” In: *Workshop on Telerobotics and Systems Engineering for Scientific Facilities*. (Madrid, Spain). Oct. 2012. Download Extended Abstract.
- [29] Ramviyas Parasuraman, Abhisekh Jain, and Narayanaswamy B. “Instrumental and Impedance Analysis of Nanoporous Alumina.” In: *International Conference on Nanomaterials and Applications (ICNA)*. (Trichy, India). 2007. Download Poster. Received [Best Poster Award](#).

Thesis Publications

- [30] Parasuraman, Ramviyas. “Wireless Communication Enhancement Methods for Mobile Robots in Radiation Environments.” Ph.D. Thesis. Universidad Politécnica de Madrid (UPM), Spain and CERN, Switzerland, 2014. Download Thesis.
- [31] Parasuraman, Ramviyas. “Mobility Enhancement for the Elderly.” Masters Thesis. Indian Institute of Technology Delhi (IIT-D) and Ecole Polytechnique Fédérale de Lausanne (EPFL), 2010. Download Thesis.
- [32] Parasuraman, Ramviyas. “Automated generation of VLSI standard cell libraries using Genetic Algorithms.” B.E. Thesis. Thiagarajar College of Engineering, Madurai (Anna University), 2008. Download Thesis.

Technical Reports and Datasets

- [33] Parasuraman, Ramviyas. “Few common failure cases in mobile robots.” In: *arXiv:1508.03000 [cs.RO]* (2015). Download Report.
- [34] Parasuraman, Ramviyas. “TIM robot pre-series energy management system specifications.” In: *CERN EDMS 1318898. EDMS 1296740 v2* (2013). (Restricted. Access Available on Request).
- [35] Parasuraman, Ramviyas and Alexander Stadler. “Wireless Video transmission tests in ISOLDE.” In: *CERN EDMS 1209799* (2012). (Restricted. Access Available on Request).
- [36] Parasuraman, Ramviyas. “Needs gathered for a mobile platform to be used in remote radiation survey and inspection applications at CERN.” In: *CERN EDMS 1326585* (2011). (Restricted. Access Available on Request).
- [37] Mohamed Haseeb and Parasuraman, Ramviyas. “Wi-Fi signal strength measurements from smartphone for various hand gestures.” In: *IEEE DataPort* (2018). doi: 10.21227/H2C362.

- [38] Parasuraman, Ramvijas, Sergio Caccamo, Fredrik Baberg, and Petter Ogren. “kth/rss dataset (v. 2016-01-05).” In: *CRAWDAD* (2016).

Invited Talks, Seminars, and Guest Lectures

- [39] *Trends in Micro Nano Multi Robot Systems*. Invited Talk, Applied Physics Seminar, UGA, Feb. 2019.
- [40] *Bridging Robotics and Wireless Networking*. Guest Lecture, FYOS 1001, UGA, Nov. 2018.
- [41] *Networked Robotics Research*. Guest Lecture, ATRI 8800, UGA, Oct. 2018.
- [42] *Robot Control, Communication, and Learning Using Wireless Networks*. Invited Talk, UGA, Apr. 2018.
- [43] *Use of Wireless Network Measurements for Mobile Robot Systems*. Invited Talk, IIT Madras, India, Mar. 2018.
- [44] *Gaussian Processes for Regression*. Seminar, SMART lab, Purdue University, USA, Jan. 2018.
- [45] *Resilient Control and Communications for Multi-Robot Systems*. Invited Talk, IIT Palakkad, India, Jan. 2018.
- [46] *Robotic Technologies for Assistive Wheelchairs*. Guest Lecture, Introduction to Assistive Technology and Robotics, Purdue University, USA, Oct. 2017.
- [47] *Tutorial on Robotarium for Multi-Robot Experiments*. Seminar, SMART lab, Purdue University, USA, Aug. 2017.
- [48] *Design Guidelines for Mobile Robotic Systems in Harsh Environments*. Guest Lecture, CNIT 581-008: Software Design and Development for Robotics, Purdue University, USA, Apr. 2017.
- [49] *Resilient Wireless Communications for Field Robots*. Invited Talk, Polytechnic Postdoctoral Seminar, Purdue University, USA, Mar. 2017.
- [50] *Short course on Robot Operating Systems (ROS)*. Guest Lecture, SMART lab, Purdue University, USA, Feb–May, 2017.
- [51] *Assistive Technologies for disabled - Mobility Enhancement*. Guest Lecture, CNIT 581-AST: Introduction to Assistive Technology and Robotics, Purdue University, USA, Oct. 2016.
- [52] *Progress on Work Package 2 of EU-FP7 TRADR Project*. Invited Talk, TRADR Review Meeting Year 2, Dortmund IFR, Germany, Mar. 2016.
- [53] *Wireless Communication Enhancement Methods for Mobile Robots in Scientific Facilities*. Invited Talk, PURESAFE Final Conference, Geneva, Switzerland, Jan. 2016.
- [54] *Generic mobile platform modules development for remote radiation survey and inspection*. Invited Talk, CERN Engineering Department Technical Meeting (ENTM), Geneva, Switzerland, Dec. 2012.

Honors, Awards, and Achievements

- Awarded **IITD-EPFL Exchange** Fellowship (2010).
- Recipient of IITD-IRD **Honorarium** (3 months) for a DST Sponsored project (2010).
- Awarded DST-MHRD India **GATE** Scholarship (2008-2010).
- **National Finalist** in Motorola Scholar Program (2008) and Cadence India Design Contest (2009).
- Awarded **Gold Medal** for *Best Outgoing Student Excellence* (out of 750+ students) at TCE (2008).
- Awarded IIT-M (Indian Institute of Technology Madras) **Summer Fellowship** (2007).

Teaching Activities

Teacher: **Spring 2019** CSCI 8535 Multi-Robot Systems (4 Credits), UGA.

It is a graduate course on the recent topics in Muti-Robot Systems research (see course contents and lecture materials here).

Fall 2018 CSCI (ATRI) 4530/6530 Introduction to Robotics (4 Credits), UGA.

It is a split-level course on Robotics (see course contents and lecture materials here).

Fall 2015, Fall 2016 EL2310 Scientific Programming (7.5 ECTS credits, 40 hours), KTH.

It is a split-level course on C, C++, and MATLAB programming (see course contents and lecture materials here). This course was co-taught by Dr. Yasemin Bekiroglu (2015) and Dr. Dr. Hakan Karao (2016).

Instructor: Short hands-on course (10 hours) on Robot Operating Systems (ROS), Purdue. **Spring 2017**.

Supervision and Mentoring

- Supervisor:** [Qin Yang](#), currently a Ph.D. student at UGA.
[Md. Redwan Islam](#), currently a Ph.D. student at UGA. (co-supervised with Prof. In Kee Kim).
[Prasanth Suresh](#), currently a Ph.D. student at UGA. (co-supervised with Prof. Prasanth Doshi).
[CURO Undergraduates at UGA](#) - Parisha Reddy, Ravi Parishar, Karthik Paladugula, Davielle Matos.
[Mohammed Haseeb](#), M.S at KTH (co-supervised by Prof. Petter Ögren), graduated Fall 2016, now with Watty, Sweden. Thesis title: Passive gesture recognition on unmodified smartphones using Wi-Fi RSSI).
[Mengchan Li](#), M.S at KTH (co-supervised by Prof. Petter Ögren), graduated Fall 2015, now with A.O.Smith, China. Thesis title: Spatial wireless connectivity prediction for mobile robots.
- Mentor:** [Wonse Jo](#), currently a Ph.D. student at Purdue.
[Shaocheng Luo](#), currently a Ph.D. student at Purdue.
[Jun-Han Bae](#), currently a Ph.D. student at Purdue.
[Shyam Kannan](#), currently a M.S student at Purdue.
[Arabinda Samantaray](#), M.S. at Purdue, graduated in Fall 2018, now an Engineer at Cisco.
[Yeonju Oh](#), M.S. at Purdue, graduated in Spring 2018.
[Dr. Michele Colledanchise](#), Ph.D. at KTH, graduated in Spring 2017, now a Postdoc at IIT Italy;
[Dr. Sergio Caccamo](#), Ph.D. at KTH, graduated in Fall 2017, now a scientist at Univrses, Sweden.
[Fredrik Båberg](#), currently a Ph.D student at KTH.
[Luca Molinari](#), graduated Fall 2014 (from University of Genoa, Italy), now with CERN.

Professional Service/Activities

- Editor:** Guest editor for a special issue on “Assistive Robotics” in the *Technologies Journal* of the MDPI Publishers (2017-2018).
- Reviewer:** Journals: *Journal of Field Robotics*, *Autonomous Robots*, *Transactions on Human-Machine Systems*, *Journal of Human-Robot Interaction*, *Journal of Intelligent Robot Systems*, *PLOS One*, *Mobile Networks and Applications*, and *IET Signal Processing*.
- PC member:** Program committee member in conferences: *Intelligent Robots and Systems (IROS)*, *Robotics and Automation (ICRA)*, *Search and Rescue Robotics (SSRR)*, *Sensors, Advances in Computing, Communications and Informatics (ICACCI)*, *Telecommunications Symposium (WTS)*, *Energy Conference (EnergyCon)*, etc.
- Professional memberships:** *IEEE Robotics and Automation Society (RAS)* (2011-2014), *IEEE Communications Society (Com-Soc)* (2011-2013), *IEEE Signal Processing Society (SPS)* (2014-present), *IFAC Associate* (2012-present), *Institution of Engineers India* (2005-2008), *TC on Telerobotics* (2015 - present), *TC on Robotics and Automation in Nuclear Facilities* (2012-present).
- Media appearance/Outreach:** I appeared in the [PURESAFE Promo/Outreach video](#) by CERN (Aug 2012).
I demonstrated cool robots during the [CERN Open Days](#) (Sep 2013), a public event which had more than 50,000 visitors.