

Ramviyas Nattanmai Parasuraman

Assistant Professor, Department of Computer Science University of Georgia (UGA)

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📍 Office: 520, Boyd GSRC, Athens, GA 30602, USA
Director: HeRo Lab - Heterogeneous Robotics Research Lab

Personal Statement

- I conduct research on networked robotics control, communication, and co-ordination 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
➢ Conduct 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) PURES SAFE, 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] Min Ku Kim et al. “Soft-packaged sensory glove system for human-like natural interaction and control of prosthetic hands.” In: *NPG Asia Material (Nature)* (2019). In Press.
- [2] 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](#).
- [3] Michele Colledanchise, Ramvijas Parasuraman, and Petter Ögren. “Learning of Behavior Trees for Autonomous Agents.” In: *Transactions on Games* 11.2 (June 2019). [Link to Paper](#). [Watch a video demonstration](#).
- [4] 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](#).
- [5] 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](#).
- [6] 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](#).
- [7] Ramvijas Parasuraman and Byung-Cheol Min. “Special issue on Assistive Robotics (Editorial).” In: *Technologies* 6.4 (Oct. 2018). [Link to Paper](#).
- [8] 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](#).
- [9] 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](#).
- [10] 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](#).
- [11] 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)

- [12] Qin Yang, Zhiwei Luo, Wenzhan Song, and Ramvijas Parasuraman. “Self-Reactive Planning of Multi-Robots with Dynamic Task Assignments.” In: *Int. Symp. on Multi Robot Systems (MRS)*. (Rutgers, NJ, USA). Aug. 2019. [Download Preprint](#).
- [13] Ramvijas Parasuraman and Byung-Cheol Min. “Consensus Control of Distributed Robots 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](#).
- [14] 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](#).
- [15] 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](#).
- [16] 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](#).
- [17] 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](#).

- [18] 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.
- [19] Alexander Owen-Hill, Ramvijas 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.
- [20] Ramvijas 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.
- [21] Ramvijas 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.
- [22] Abhisekh Jain, Arvind Seshadhri, Balaji BS, and Ramvijas Parasuraman. “Onboard Dynamic Rail Track Safety Monitoring System.” In: *International Conference on Advanced Communication Systems*. Coimbatore, India. 2007. Download Paper.

Extended Abstracts/Posters (Refereed)

- [23] Wonse Jo, Shyam Sundar Kannan, Ramvijas 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.
- [24] Ramvijas 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.
- [25] Jun-Han Bae, Ramvijas 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.
- [26] Ramvijas 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.
- [27] Danilo Tardioli, Ramvijas Parasuraman, Petter Ogren, 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.
- [28] Shaocheng Luo, Ramvijas 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.
- [29] Ramvijas 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.
- [30] Ramvijas 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.
- [31] Ramvijas 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

- [32] Parasuraman, Ramvijas. “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.
- [33] Parasuraman, Ramvijas. “Mobility Enhancement for the Elderly.” Masters Thesis. Indian Institute of Technology Delhi (IIT-D) and Ecole Politecnica Federal de Lausanne (EPFL), 2010. Download Thesis.
- [34] Parasuraman, Ramvijas. “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

- [35] Parasuraman, Ramvijas. “Few common failure cases in mobile robots.” In: *arXiv:1508.03000 [cs.RO] (2015)*. Download Report.
- [36] Parasuraman, Ramvijas. “TIM robot pre-series energy management system specifications.” In: *CERN EDMS 1318898. EDMS 1296740 v2 (2013)*. (Restricted. Access Available on Request).
- [37] Parasuraman, Ramvijas and Alexander Stadler. “Wireless Video transmission tests in ISOLDE.” In: *CERN EDMS 1209799 (2012)*. (Restricted. Access Available on Request).
- [38] Parasuraman, Ramvijas. “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).

- [39] Mohamed Haseeb and Parasuraman, Ramviyas. "Wi-Fi signal strength measurements from smartphone for various hand gestures." In: *IEEE DataPort* (2018). doi: 10.21227/H2C362.
- [40] Parasuraman, Ramviyas, Sergio Caccamo, Fredrik Baberg, and Petter Ogren. "kth/rss dataset (v. 2016-01-05)." In: *CRAWDAD* (2016).

Invited Talks, Seminars, and Guest Lectures

- [41] *Trends in Micro Nano Multi Robot Systems*. Invited Talk, Applied Physics Seminar, UGA, Feb. 2019.
- [42] *Bridging Robotics and Wireless Networking*. Guest Lecture, FYOS 1001, UGA, Nov. 2018.
- [43] *Networked Robotics Research*. Guest Lecture, ATRI 8800, UGA, Oct. 2018.
- [44] *Robot Control, Communication, and Learning Using Wireless Networks*. Invited Talk, UGA, Apr. 2018.
- [45] *Use of Wireless Network Measurements for Mobile Robot Systems*. Invited Talk, IIT Madras, India, Mar. 2018.
- [46] *Gaussian Processes for Regression*. Seminar, SMART lab, Purdue University, USA, Jan. 2018.
- [47] *Resilient Control and Communications for Multi-Robot Systems*. Invited Talk, IIT Palakkad, India, Jan. 2018.
- [48] *Robotic Technologies for Assistive Wheelchairs*. Guest Lecture, Introduction to Assistive Technology and Robotics, Purdue University, USA, Oct. 2017.
- [49] *Tutorial on Robotarium for Multi-Robot Experiments*. Seminar, SMART lab, Purdue University, USA, Aug. 2017.
- [50] *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.
- [51] *Resilient Wireless Communications for Field Robots*. Invited Talk, Polytechnic Postdoctoral Seminar, Purdue University, USA, Mar. 2017.
- [52] *Short course on Robot Operating Systems (ROS)*. Guest Lecture, SMART lab, Purdue University, USA, Feb–May, 2017.
- [53] *Assistive Technologies for disabled - Mobility Enhancement*. Guest Lecture, CNIT 581-AST: Introduction to Assistive Technology and Robotics, Purdue University, USA, Oct. 2016.
- [54] *Progress on Work Package 2 of EU-FP7 TRADR Project*. Invited Talk, TRADR Review Meeting Year 2, Dortmund IFR, Germany, Mar. 2016.
- [55] *Wireless Communication Enhancement Methods for Mobile Robots in Scientific Facilities*. Invited Talk, PURESAFE Final Conference, Geneva, Switzerland, Jan. 2016.
- [56] *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.
[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: Intl. J. Robotics Research, Journal of Field Robotics, Autonomous Robots, Transactions on Human-Machine Systems, Transactions on 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), Multi Robot Systems (MRS), Distributed Autonomous Robots Systems (DARS), 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 PURES SAFE [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.