Sarthak Misra

Contact Information

Horstring West 208, BW-CTW
University of Twente, P. O. Box 217
7500 AE Enschede
The Netherlands

Phone: +31-53-489-2704/4855
Mobile: +31-6-81319977
E-mail: s.misra@utwente.nl
WWW: http://www.surgicalroboticslab.nl

Citizenship

Canada

Education

The Johns Hopkins University, Baltimore, USA
Ph.D., Mechanical Engineering, January 2005 - July 2009
Advisor: Allison M. Okamura

McGill University, Montreal, Canada
M.Eng., Mechanical Engineering, September 1999 - July 2001

National Institute of Technology (NIT), Warangal, India
B.Tech., Mechanical Engineering, September 1994 - May 1998

Work/Research Experience

University of Twente, Enschede, The Netherlands
Faculty of Engineering Technology (Biomechanical Engineering)
MIRA–Institute for Biomedical Technology and Technical Medicine
Associate Professor, October 2011 - Present (*Adjunct-Hoogleraar* since March 2015)
Assistant Professor, August 2009 - September 2011

University of Groningen and University Medical Center Groningen, The Netherlands
Department of Biomedical Engineering
Associate Professor, October 2014 - Present

The Johns Hopkins University, Baltimore, USA
Research Assistant (Laboratory for Computational Sensing & Robotics), January 2005 - July 2009
Department of Mechanical Engineering

Eidgenössische Technische Hochschule (ETH), Zürich, Switzerland
Visiting Scholar (Virtual Reality in Medicine Group), April - May 2008
Department of Information Technology and Electrical Engineering

MacDonald Dettwiler and Associates (MDA) Space Missions, Montreal, Canada
Mission Analyst (Mission Operations and Analysis Group), August 2001 - December 2004
Canadian Space Agency

McGill University, Montreal, Canada
Research Assistant (Center for Intelligent Machines), September 1999 - July 2001
Department of Mechanical Engineering

Whirlpool Corporation, New Delhi, India
Engineer (Product Development), June 1998 - August 1999

Indian Space Research Organization, Ahmedabad, India
Summer Intern (Antenna Systems Group), May 1997 - June 1998

Space Application Center

Teaching Experience

University of Twente, Enschede, The Netherlands

Instructor (*Case II: Robotics and Imaging*), February - July 2010, February - July 2011, February - July 2012

Instructor (*Robotics for Medical Applications*), February - April 2011, February - April 2012, November 2013 - January 2014, November 2014 - January 2015, November 2015 - January 2016

The Johns Hopkins University, Baltimore, USA

Teaching Assistant (*Engineering Physics* and *Adaptive Systems*), September 2007 - December 2008

McGill University, Montreal, Canada

Teaching Assistant (*Mechanics I* and *Spacecraft Dynamics*), September 2000 - April 2001

Honors and Awards

Best Conference Paper and Best Poster Awards at IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), Singapore 2016

Netherlands Organization for Scientific Research (NWO) VIDI award, 2015

European Research Council (ERC) Starting Grant, 2014

Best Conference Paper Award at IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), São Paulo, Brazil, 2014

Finalist for Best Application Paper at IEEE International Conference on Intelligent Robots and Systems (IROS): San Francisco, USA - 2011 and Tokyo, Japan, 2013

University Teaching Qualification (UTQ/BKO) certification from Dutch 3TU (Three Technical Universities), 2011

Netherlands Organization for Scientific Research (NWO) VENI award, 2010

IEEE Robotics and Automation Society (RAS) travel award to attend IEEE International Conference on Robotics and Automation (ICRA), Kobe, Japan, 2009

Best Poster Award, Medicine Meets Virtual Reality 16, 2008

IEEE RAS Technical Committee on Haptics student travel award to visit ETH Zürich, 2007

Link Foundation Fellowship, to pursue research in the development of advanced surgical simulation systems and covers graduate student stipend, 2007

NASA Space Flight Awareness Award, for risk mitigation analysis and software support during P5 truss installation to the International Space Station (ISS), 2005

NASA Space Flight Awareness Award, for my work done on the ISS robotics flight software, 2004

McGill Major Fellowship, awarded to the student with the highest GPA in the department, 2000

NIT Merit Scholarship, awarded to the top three students of the class each year, 1996 and 1998

Research Grants

(1) *Steering Actuated Probes under Magnetic- and Ultrasound-Guidance for Targeted Interventions (SAMURAI)*
Principal investigator
Funding agency: Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO - Netherlands Organization for Scientific Research) Innovational Research Incentives Scheme (VIDI)
Project details: €1.13M, January 2017 - December 2021

(2) *Enhanced Drug Delivery Ecosystem for Neurosurgery in 2020 (EDEN2020)*
Project partner (Project co-ordintor: Ferdinando Rodriguez y Baena)

Funding agency: European Commission Horizon 2020 - Information and Communications Technologies (ICT-24-2015)
Project details: €715K, April 2016 - March 2020

(3) *Robot-Assisted Flexible Needle Steering for Targeted Delivery of Magnetic Agents (ROBOTAR)*

Principal investigator
Funding agency: European Research Council (ERC) Starting Grant
Project details: €1.5M, June 2015 - May 2020

(4) *Steerable Catheter for Magnetic Resonance Environment (SCORE)*
Principal investigator
Funding agency: MIRA–Institute for Biomedical Technology and Technical Medicine (University of Twente) to stimulate multidisciplinary and translational research
Project details: €40K, January 2015 - December 2015

(5) *Robotic Interventions using CT-Images for Biopsies of Lung Nodules (RICIBION)*
Co-investigator (Principal investigator: Matthijs Oudkerk)
Funding agency: Samenwerkingsverband Noord-Nederland (SNN) Program: Product Innovations within Center for Medical Imaging - Northeast Netherlands (CMI-NEM)
Project details: €280K, July 2013 - June 2017

(6) *Ultrasound Enhancement (USE)*
Principal investigator (Co-investigator: Matthieu Rutten)
Funding agency: Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO - Netherlands Organization for Scientific Research) Innovative Medical Devices Initiative (IMDI)
Project details: €312K, June 2013 - May 2016

(7) *Multi-Steerable Catheter for Cardiac Interventions (MULTI)*
Co-investigator (Principal investigator: Paul Breedveld)
Funding agency: Technologiestichting STW (Dutch Technology Foundation) Perspectief Program, *i*MIT: Instruments for Minimally Invasive Techniques–Interactive Multi-Interventional Tools
Project details: €303K, October 2012 - September 2016

(8) *Shared Control for Robotically Steering Flexible Needles*
Principal investigator (Co-investigator: John J. van den Dobbelsteen)
Funding agency: Technologiestichting STW (Dutch Technology Foundation) Perspectief Program, H-Haptics: Human-centered design of haptic interfaces
Project details: €267K, September 2011 - August 2015

(9) *Robotically Steering Needles using Biomechanical Models and Ultrasound-Guided Control*
Principal investigator
Funding agency: Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO - Netherlands Organization for Scientific Research) Innovational Research Incentives Scheme (VENI)
Project details: €250K, January 2011 - December 2014

(10) *Minimally Invasive Robotics in an MRI Environment (MIRIAM)*
Principal investigator (Co-investigators: Herman van der Kooij and Ferdinand van der Heijden)
Funding agency: Dutch Ministry of Economic Affairs Pieken in de Delta (PIDON) program
Project details: €485K, July 2010 - May 2015

PATENTS

US Provisional Patent 61588968: *A Joint Lock for Prosthetic Fingers* – Gert Jan Pieterse, Bart Peerdeman, Edsko E. G. Hekman, Dannis M. Brouwer, Johan S. Reitman, **Sarthak Misra**

ADVISING

Post-doctoral fellows

(1) Alper Denasi (*University of Twente*): July 2015 - Present

(2) Stefano Scheggi (*University of Twente*): July 2015 - Present

(3) Aisha Meel-van den Abeelen (*University of Twente*): June 2014 - December 2015 (with Chris de Korte)

(4) Pedro Lopes da Frota Moreira (*University of Twente*): May 2013 - Present

(5) Luis Alonso Sánchez Secades (*University of Twente*): January 2014 - December 2014

(6) Islam S. M. Khalil (*University of Twente*): January 2012 - August 2013

(7) Wissam Assaad (*University of Twente*): July 2011 - August 2012

(8) Wabe W. Koelmans (*University of Twente*): July 2011 - December 2011 (with Niels Tas)

(9) Ganeshram Krishnamoorthy (*University of Twente*): April 2010 - July 2011 (with Niels Tas)

(10) Jorn op den Buijs (*University of Twente*): July 2010 - January 2011

Doctoral candidates

(1) Fouzia Khan (*University of Groningen and University Medical Center Groningen*): July 2016 - Present. Expected graduation June 2020

(2) Klaas Jelmer Boskam (*University of Groningen and University Medical Center Groningen*): June 2016 - Present. Expected graduation March 2020

(3) Jakob Sikorski (*University of Twente*): September 2015 - Present. Expected graduation August 2019

(4) Federico Ongaro (*University of Twente*): June 2015 - Present. Expected graduation May 2019

(5) Navid Shahriari (*University of Twente*): October 2013 - Present. Expected graduation September 2017

(6) Gustaaf J. Vrooijink (*University of Twente*): January 2013 - Present. Expected graduation December 2016

(7) Roy J. Roesthuis (*University of Twente*): November 2011 - Present. Expected graduation August 2016

(8) Martijn G. Schouten (*Radboud University Nijmegen Medical Center*): November 2010 - Present. Expected graduation December 2016 (with Jurgen Fütterer)

(9) Joyce Bomers (*Radboud University Nijmegen Medical Center*): September 2009 - Present. Expected graduation December 2015 (with Jurgen Fütterer)

(10) Momen Abayazid (*University of Twente*): "Robotically steering flexible needles", *Doctoral degree (Biomechanical Engineering)*, Faculty of Engineering Technology, February 2011 - August 2015

(11) Bart Peerdeman (*University of Twente*): "Development of an underactuated hand prosthesis with compliant control", *Doctoral degree (Robotics and Mechatronics)*, Faculty of Electrical Engineering, Mathematics, and Computer Science, November 2009 - May 2014 (with Stefano Stramigioli)

(12) Rob Reilink (*University of Twente*): "Image-based robotic steering of advanced flexible endoscopes and instruments", *Doctoral degree (Robotics and Mechatronics)*, Faculty of Electrical Engineering, Mathematics, and Computer Science, August 2008 - April 2013 (with Stefano Stramigioli)

(13) Michel C. J. Franken (*University of Twente*): "Control of haptic interaction: an energy-based approach", *Doctoral degree (Control Engineering)*, Faculty of Electrical Engineering, Mathematics, and Computer Science, May 2007 - September 2011 (with Stefano Stramigioli)

Master's degree students

(1) T. C. Krishna Kumar (*University of Twente*): "Tracking and control of soft, self-folding miniaturized agents using two dimensional ultrasound images", *Master's degree in Computer Science*, Faculty of Electrical Engineering, Mathematics, and Computer Science, March 2016 - September 2016

(2) Leanne Kuil (*University of Twente*): January 2016 - Present. Expected graduation August 2016

(3) Imro Dawson (*University of Twente*): "Development of continuum robots for medical applications: Design and modeling of magnetically and water jet actuated manipulators", *Master's degree in Biomedical Engineering and Industrial Design Engineering*, Faculty of Enginnering Technology, September 2015 - September 2016

(4) Hussein Dumirieh (*University Medical Center Groningen*): "Steerable catheters under magnetic field guidance and using optical system for catheter-tip tracking in 3D", *Master's degree in Biomedical Engineering*, Faculty of Medical Sciences, February 2015 - May 2016

(5) Klaas Jelmer Boskma (*University Medical Center Groningen*): "Closed-loop control of a magnetically-actuated catheter using two-dimensional ultrasound images ", *Master's degree in Biomedical Engineering*, Faculty of Medical Sciences, November 2014 - May 2016

(6) Frank van den Brink (*University of Twente*): "Manipulation of soft grippers for pick-and-place tasks", *Master's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, January 2015 -March 2016

(7) Tim van Katwijk (*University of Twente*): "Design of a 2 degree of freedom CT-compatible remote center of motion manipulator", *Master's degree in Biomedical Engineering*, Faculty of Science and Technology, November 2014 - March 2016

(8) Myléne Jansen (*University of Twente*): "Three-dimensional translation and rotation of the mitral valve during the cardiac cycle", *Master's degree in Technical Medicine*, Faculty of Science and Technology, September 2015 - November 2015

(9) Manon Tolhuisen (*University of Twente*): "Three-dimensional spatial movement of the mitral valve", *Master's degree in Technical Medicine*, Faculty of Science and Technology, December 2014 - February 2015

(10) Anastasios Zompas (*University of Twente*): "Three-dimensional needle steering using Automated Breast Volume Scanner", *Master's degree in Electrical Engineering*, February 2014 - February 2015

(11) Tim T. M. Ellenbroek (*University of Twente*): "Ultrasound-guided control of a minimally invasive surgical instrument", *Master's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, January 2013 - September 2013

(12) Bart A. Reefman (*University of Twente*): "Control of magnetic-microrobots: an experimental study", *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, February 2013 - August 2013

(13) Marc P. Pichel (*University of Twente*): "Characterization and control of magnetotactic bacteria", *Master's degree in Biomedical Engineering–Molecular, Cellular and Tissue Engineering*, Faculty of Science and Technology, January 2012 - June 2013

(14) Kaj Gijsbertse (*University of Twente*): "3D localization of targets in curved soft-tissue phantoms using 2D ultrasound images", *Master's degree in Biomedical Engineering–Biomechanical Engineering*, Faculty of Science and Technology, January 2012 - June 2013

(15) Roel M. P. Metz (*University of Twente*): "Realization of three-dimensional magnetically-actuated microrobotic system", *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, October 2011 - April 2013

(16) Mark Herink (*University of Twente*): "Finite element modelling of prostate deformation and needle-tissue interactions", *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, September 2011 - January 2013

(17) Gustaaf J. Vrooijink (*University of Twente*): "Real-time three-dimensional tracking and steering of flexible needles using two-dimensional ultrasound images", *Master's degree in Electrical Engineering–Control Engineering and Measurement Science*, Faculty of Electrical Engineering, Mathematics, and Computer Science, October 2011 - December 2012

(18) Sander L. Janssen (*University of Twente*): "Image-guided control of a continuum robot", *Master's degree in Electrical Engineering–Control Engineering and Measurement Science*, Faculty of Electrical Engineering, Mathematics, and Computer Science, November 2011 - November 2012

(19) Marco Kemp (*University of Twente*): "Flexible needle steering using fiber bragg grating sensors", *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, November 2011 - August 2012

(20) Gert Jan Pieterse (*University of Twente*): "Design of a joint lock for prosthetic fingers", *Master's degree in Mechanical Engineering–Biomechanical Engineering*, Faculty of Engineering Technology, January 2011 - January 2012 (with Hans Rietman)

(21) Jasper D. Keuning (*University of Twente*): "Image-based magnetic control of microparticles", *Master's degree in Electrical Engineering–Measurement and Instrumentation*, Faculty of Electrical Engineering, Mathematics, and Computer Science, November 2010 - December 2011

(22) Roy J. Roesthuis (*University of Twente*): "Flexible needle steering using a mechanics-based approach", *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, October 2010 - November 2011

(23) Youri R. J. van Veen (*University of Twente*): "Needle and soft tissue: experimental design and observations", *Master's degree in Mechanical Engineering–Biomechanical Engineering*, Faculty of Engineering Technology, August 2010 - June 2011

(24) Martijn G. Schouten (*University of Twente*): "Introduction of a new robotic technique for MRI-guided transrectal prostate biopsy: safety and accuracy aspects", *Master's degree in Technical Medicine*, Faculty of Science and Technology, January - October 2010 (with Jurgen Fütterer)

Bachelor's / Pre-Master's degree and visiting students

(1) Adnan Arnaout (*American University of Beirut*): "Self-propelled microjets", *Bachelor's degree in Mechanical Engineering*, June 2016 - August 2016

(2) Ghassan Ouiedat (*American University of Beirut*): *Bachelor's degree in Mechanical Engineering*, June 2016 - Present. Expected graduation August 2016

(3) Ben Sawaryn (*University of Twente*): "Path planning for micro-sized agents with motion uncertainities", *Bachelor's degree in Biomedical Engineering*, April 2016 - August 2016

(4) Rosalyn Sleurink (*University of Twente*): "Implementation of a C++ algorithm for the detection of lesions using the automated breast volume scanner (ABVS)", *Bachelor's degree in Biomedical Engineering*, April 2016 - August 2016

(5) Hassna Irzan (*Politecnico di Torino*): *Master's degree in Mechatronic Engineering*, March 2016 - Present. Expected graduation September 2016

(6) Itai Heijmans (*University Medical Center Groningen*): "Development of a coaxial flexible needle", *Bachelor's degree in Biomedical Engineering*, Faculty of Medical Sciences, February 2016 - August 2016

(7) Avi Cohen (*Royal Institute of Technology*): *Bachelor's degree in Engineering and Economics*, February 2016 - Present. Expected graduation September 2016

(8) Pedro Miguel Francisco Dias (*New University of Lisbon*): *Master's degree in Biomedical Engineering*, February 2016 - Present. Expected graduation September 2016

(9) Nicole Fasiello (*Politecnico di Milano*): *Master's degree in Automation and Control Engineering*, October 2015 - Present. Expected graduation April 2016

(10) Nienke Sibum (*University Medical Center Groningen*): "Needle tracking based on radio frequency-data for needle steering applications", *Bachelor's degree in Biomedical Engineering*, April 2015 - June 2015.

(11) Patrick Braakman (*University of Twente*): "Positioning accuracy improvement of a robotically-actuated delivery sheath (RADS) for cardiovascular applications", *Bachelor's degree in Mechanical Engineering - Introduction into Technical Research*, February 2015 - June 2015.

(12) Nick Boer (*University of Twente*): "Positioning accuracy improvement of a robotically-actuated delivery sheath (RADS) for cardiovascular applications", *Bachelor's degree in Mechanical Engineering - Introduction into Technical Research*, February 2015 - June 2015.

(13) Kees van Teeffelen (*University of Twente*): "Review of actuation principles and design recommendation for a robotically-actuated catheter", *Bachelor's degree in Mechanical Engineering - Introduction into Technical Research*, February 2015 - June 2015.

(14) Anders van Riesen (*University of Twente*): "Review of actuation principles and design recommendation for a robotically-actuated catheter", *Bachelor's degree in Mechanical Engineering - Introduction into Technical Research*, February 2015 - June 2015

(15) Teresa Araújo (*University of Porto*): "Segmentation and three-dimensional reconstruction of lesions using the automated breast volume scanner (ABVS)", *Master's degree in the Faculty of Engineering*, February 2015 - July 2015

(16) Guilherme Aresta (*University of Porto*): "Preoperative path planning for flexible bevel-tip needle rotation minimization", *Master's degree in the Faculty of Engineering*, February 2015 - July 2015

(17) Fotis Avgidis (*University of Twente*): "Visual tracking of magnetic microrobots: Tracking system evaluation", *Bachelor's degree in Electrical Engineering*, August 2014 - March 2014

(18) Marius Gras (*École Nationale Supérieure de Techniques Avancées (ENSTA ParisTech)*): "Ultrasound image-based needle steering and target reconstruction", *Bachelor's degree in Electrical Engineering*, May 2014 - August 2014 (visiting student)

(19) Youssef Michel Sadek (*German University in Cairo*): "Mobi-Mag: A compact device for medical research using wireless control of magnetic microrobots", *Bachelor's degree in Mechatronics*, April 2014 - July 2014 (visiting student)

(20) Boudewijn van der Berg (*University of Twente*): "Visual tracking of magnetic microrobots in biomedical research applications", *Bachelor's degree in Biomedical Engineering*, February 2014 - August 2014

(21) Rodolfo Santos (*ITA-Instituto Tecnológico de Aeronáutica*): "Real-time path-planning in three-dimensional space for a paramagnetic microparticle using a dual resolution A-Star algorithm", *Master's degree in Electronics Engineering*, October 2013 - July 2014 (visiting student)

(22) Kareem M. Youakim (*German University in Cairo*): "Magnetic-based motion control of a sperm-shaped microrobot using weak oscillating magnetic fields", *Master's degree in Mechatronics*, Faculty of Engineering and Materials Science, January 2014 - February 2014 (visiting student)

(23) Herman Dijkslag (*University of Twente*): "MagnetoSperm: a microrobot that navigates using weak magnetic fields", *Bachelor's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, April 2012 - August 2013

(24) Hans Kolk (*University of Twente*): "Characterization, modeling and control of magnetic microrobots", *Bachelor's degree in Advanced Technology*, Faculty of Science and Technology, May 2012 - August 2013

(25) Pedro Rafael Tomé Ferreira (*New University of Lisbon*): "Ultrasound-based magnetic control of paramagnetic microparticles in water", April 2013 - August 2013 (ERASMUS student)

(26) Ricardo Jorge Neves Eleutério (*New University of Lisbon*): "Ultrasound-based magnetic control of paramagnetic microparticles in water", April 2013 - August 2013 (ERASMUS student)

(27) Marcello Valori (*Politecnico di Bari*): "UT hand I: a lock-based underactuated hand prosthesis", October 2012 - July 2013 (visiting doctoral student, with Stefano Stramigioli)

(28) Laurie M. Overbeek (*University of Twente*): "Force sensing using fiber bragg gratings", *Bachelor's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, April 2012 - June 2013

(29) Bart A. Reefman (*University of Twente*): "Three-dimensional tracking of magnetotactic bacteria", *Pre-Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, February 2012 - February 2013

(30) Peter Westenberg (*Saxion Hogeschool Enschede*): "Integration of modular and intuitive software platform for MyoPro next generation hand prothesis", *Bachelors degree in Mechatronics*, Life Science, Engineering & Design, September 2012 - February 2013

(31) Peter-Jan Vos (*University of Twente*): "Effect of system parameters on target motion", *Bachelor's degree in Advanced Technology*, Faculty of Science and Technology, May 2012 - January 2013

(32) Frank van den Brink (*University of Twente*): "Modeling and magnetic-based motion control of a cluster of microparticles", *Bachelor's degree in Advanced Technology*, Faculty of Science and Technology, May 2012 - January 2013

(33) Arnoud Stapelbroek (*Saxion Hogeschool Enschede*): "Investigation and improvement of a friction-based joint lock", *Bachelors degree in Mechanical Engineering*, Life Science, Engineering & Design, February 2012 - July 2012 (with Dannis Brouwer)

(34) Thomas R. Kerkhof (*University of Twente*): "Design of a flexible needle insertion device with synchronous ultrasound imaging of target", *Pre-Master's degree in Electrical Engineering–Measurement and Control Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, September 2010 - January 2012

(35) Mitchel Bakker (*University of Twente*): "Feedback control for steering flexible bevel-tip needles", *Bachelor's degree in Advanced Technology*, Faculty of Science and Technology, April - September 2011

(36) Auke Been (*University of Twente*): "Microscopic observations of needle-tissue interactions", *Bachelor's degree in Advanced Technology*, Faculty of Science and Technology, May 2010 - March 2011

(37) Giovanni Botti (*University of Naples*): "Myopro project: state of the art of prosthetic hands and detection of the slip on a robotic ringer", *Laurea degree in Computer and Systems Engineering*, Faculty of Engineering, December 2009 - May 2010 (visiting student, with Stefano Stramigioli)

Invited Talks

Le Groupement de Recherche (GdR) en Robotique, *Centre National de la Recherche Scientifique (CNRS)* , Paris, France, November 2016

Department of Mechanical Engineering, *Korea Advanced Institute of Science and Technology (KAIST)*, Daejeon, South Korea, October 2016

Workshop in Surgical Robotics, *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Singapore, June 2016

Kolff Days, *W. J. Kolff Conference*, Schiermonnikoog, Netherlands, April 2016

Department - Physical Intelligence, *Max Planck Institute for Intelligent Systems*, Stuttgart, Germany, March 2016

Workshop on Navigation and Actuation of Flexible Instruments in Medical Applications, *IEEE International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, October 2015

Sunnybrook Health Sciences Centre, *University of Toronto*, Canada, September 2015

7th Summer School on Surgical Robotics, Montpellier - La Grande-Motte, France, September 2015

Micro-robotics and Design Challenge, *Hamlyn Symposium*, London, UK, June 2015

BioInspired Technology Session, *Design of Medical Devices Conference - Europe*, Delft, Netherlands, October 2014

10 Year Anniversary, *Thorax Centrum Twente*, Almelo, Netherlands, September 2014

International Workshop on Micro- and Nano-machines, Hannover, Germany, July 2014

Workshop on Crossing the Reality Gap: Control, Human Interaction and Cloud Technology for Multi- and Many-Robot Systems, *IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May-June 2014

Department - Theory of Inhomogeneous Condensed Matter (Smart Nano-Bio-Devices), *Max Planck Institute for Intelligent Systems*, Stuttgart, Germany, December 2013

Department of Mechanical Engineering and Integrative Biosciences and Biotechnology, *Pohang University of Science and Technology (POSTECH)*, Pohang, Korea, October 2013

Smart Prevention, Rehabilitation & INtervention Technologies at home for improved mobility (SPRINT) colloquium, *University Medical Center Groningen*, The Netherlands, September 2013

PhD Course - Modular Surgical Robotics, Department of Electronics, Information and Bioengineering, *Politecnico di Milano*, Milan, Italy, July 2013

Department of Mechanical Engineering, *Columbia University*, New York City, USA, November 2012

Surgical Planning Laboratory (Department of Radiology), *Brigham and Women's Hospital (Harvard*

Medical School), Boston, USA, November 2012

Neurosurgery Division, *Brainlab AG*, Munich, Germany, November 2012

Workshop on Imaging Systems: Center for Medical Imaging North East Netherlands, *KIVI NIRIA (The Royal Institute of Engineers in the Netherlands) Annual Conference*, Enschede, The Netherlands, October 2012

Workshop on Algorithmic Frontiers in Medical Robotics: Manipulation in Uncertain, Deformable, Heterogeneous Environments, *Robotics Science and Systems (RSS)*, Sydney, Australia, July 2012

Surgical Robotics Symposium, *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, June 2012

Workshop on Pathways to Clinical Needle Steering: Recent Advances and Future Applications, *IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, USA, May 2012

Human Friendly Robotics, *University of Twente*, Enschede, The Netherlands, November 2011

Dynamics and Control Methods for Medical Robotics, *Dutch Institute of Systems and Control (DISC) Summer School*, Noordwijkerhout, The Netherlands, June 2011

Department of Mechanical Engineering, *Katholieke Universiteit Leuven*, Leuven, Belgium, March 2011

Department of Electronics, Computer Science, and Systems, *University of Bologna*, Bologna, Italy, January 2011

Innovatieplatform Twente and Kennispark Twente, *Health Valley*, Enschede, The Netherlands, November 2010

Department of Mechanical Engineering, *Eindhoven University of Technology*, Eindhoven, The Netherlands, February 2010

Center for Systems Engineering and Applied Mechanics, *Catholic University of Louvain (UCL)*, Louvain-la-Neuve, Belgium, December 2009

Faculty of Mechanical, Maritime and Materials Engineering, *Delft University of Technology*, Delft, The Netherlands, September 2009

Department of Biomedical Engineering, *Columbia University*, New York City, USA, January 2009

Faculty of Electrical Engineering, Mathematics, and Computer Science, *University of Twente*, Enschede, The Netherlands, December 2008

Department of Physiology, *Maastricht University*, Maastricht, The Netherlands, November 2008

Department of Information Technology and Electrical Engineering, *ETH*, Zürich, Switzerland, May 2008

Institute for Pure and Applied Mathematics, *University of California*, Los Angeles, USA, January 2008

Service Activities

Technical Reviewer

- *Journals*: IEEE Transactions on Robotics, International Journal of Robotics Research, Mechatronics, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Industrial Electronics, IEEE Transactions on Control Systems Technology, Control Systems Practice, Computers and Graphics, IEEE Computer Graphics & Applications, IEEE Transactions on Medical Imaging, Medical Image Analysis, Biomedical Microdevices, Annals of Biomedical Engineering, Medical Physics, Journal of Medical and Biological Engineering, Journal of the Mechanical Behavior of Biomedical Materials, IEEE Transactions on Biomedical Engineering, Journal of Mechanics in Medicine and Biology, Computer Methods in Biomechanics and Biomedical Engineering, Medical & Biological Engineering & Computing, Medical Engineering & Physics, International Journal of Computer Assisted Radiology and Surgery, Journal of Biological Engineering, Journal of Biomedical and Health Informatics, Bioinspiration & Biomimetics, ASME Journal of Computing and Information Science in Engineering, Math-

ematical and Computer Modelling of Dynamical Systems, ASME Manufacturing Science and Engineering, Tribology International, PLoS ONE
- *Conferences*: IEEE International Conference on Robotics and Automation (ICRA), IEEE International Conference on Intelligent Robots and Systems (IROS), IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), Robotics Systems and Science (RSS), World Haptics, EuroHaptics, SIGGRAPH
- *Research Grants*: Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC), Foundation for Scientific Research - Flanders, Belgium (FWO), Portuguese Foundation for Science and Technology (FCT), Agency for Science, Research & Technology, Singapore (A*STAR), US Army Medical Research and Materiel Command

Professional Membership

- Institute for Electrical and Electronic Engineers (IEEE) – Robotics and Automation Society (RAS) and Engineering in Medicine and Biology Society (EMBS)
- Dutch Institute of Systems and Control (DISC)

Program Committees and Editorial Boards

- Program Chair for the 2018 IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), July 2018, Enschede, The Netherlands
- Associate editor for *Journal of Medical Robotics Research*, January 2015 - Present
- Co-organizer of the BioRob Workshop *Robotic Microsurgery and Image-Guided Surgical Interventions*, São Paulo, Brazil, August 2014
- Associate editor for IEEE EMBS Conference Editorial Board, Chicago, USA, August 2014
- Editorial Board of the *Frontiers in Robotics and AI*, March 2013 - Present
- Organizing committee of 33rd Benelux Meeting on *Systems and Control*, 2014
- Guest editor of Special Issue on *Design, Fabrication, Control, and Planning of Multiple Mobile Microrobots* in the *International Journal of Advanced Robotic Systems*, 2014
- Co-organizer of the *3rd Joint Workshop on New Technologies for Computer/Robot Assisted Surgery*, Verona, Italy, September 2013
- Editorial Board of the *International Journal of Advanced Robotic Systems*, April 2013 - Present
- Member of the Executive Committee for the *Surgical Robotics Symposium* at IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), Rome, Italy, June 2012
- Co-chair of IEEE RAS Technical Committee on *Surgical Robotics*, 2012 - Present
- Dutch representative for the International Federation of Automatic Control (IFAC) Technical Committee on *Biological and Medical Systems*, 2011 - Present
- Co-organizer of the IROS Workshop *Image-Guided Medical Robotic Interventions*, San Francisco, USA, September 2011
- Co-organizer of the DISC Summer School on *Dynamics and Control Methods for Medical Robotics*, Noordwijkerhout, The Netherlands, June 2011
- Associate editor for IEEE RAS Conference Editorial Board, September 2010 - Present
- Associate editor for IEEE EMBS Conference Editorial Board, Osaka, Japan, July 2013
- Associate editor for IEEE EMBS Conference Editorial Board, San Diego, USA, August-September 2012
- Associate editor for IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), Rome, Italy, June 2012
- Associate editor for IEEE IROS Conference Editorial Board, San Francisco, USA, September 2011
- Associate editor for IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Montreal, Canada, July 2010

Theses Committees

- Nick J van de Berg (*Delft University of Technology*): *Doctoral degree in BioMechanical Engineering*, October 2016

- Alexander Philipp Manuel Erich Leibinger (*Imperial College London*): *Doctoral degree in Mechanical Engineering*, September 2016
- Bishoy Emil Edward Wissa (*German University in Cairo*): *Master's degree in Mechatronics Engineering*, Faculty of Engineering, July 2015
- Omar Salah El-din Abdellatif (*German University in Cairo*): *Master's degree in Mechatronics Engineering*, Faculty of Engineering, July 2015
- Tim Weber (*University of Groningen and University Medical Center Groningen*): *Doctoral degree in Orthopedics*, Faculty of Medical Sciences, June 2015
- Ron Slomp (*University of Twente*): *Master's degree in Mechanical Engineering*, Faculty of Engineering Technology, May 2015
- Tim Sprang (*Delft University of Technology*): *Master's degree in Biomechanical Engineering*, Faculty of Mechanical, Maritime, and Materials Engineering, December 2014
- Bruce J. Boti (*University of Twente*): *Master's degree (Stage M2) in Technical Medicine*, Faculty of Science and Technology, August 2014
- Jeroen van Aalst (*University of Twente*): *Capita Selecta in Mechanical Engineering - Applied Mechanics*, Faculty of Engineering Technology, February - April 2014
- Jin Peng (*University of Twente*): *Master's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, September 2013
- Gerda F. Dedden (*University of Twente*): *Bachelor's degree in Biomedical Technology*, Faculty of Science and Technology, July 2013
- Marloes de Voer (*University of Twente*): *Master's degree in Biomedical Engineering*, Faculty of Engineering Technology, June 2013
- Willy Johanna Zevenbergen (*University of Twente*): *Master's degree in Biomedical Engineering*, Faculty of Engineering Technology, December 2012
- Lars Zondervan (*University of Twente*): *Master's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, September 2012
- Susan Brouwer de Koning, Astrid Hoving, Marloes Jansen, and Lot Jeurink (*University of Twente*): *Bachelor's degree in Technical Medicine*, Faculty of Science and Technology, June 2012
- Nanda van der Stap (*University of Twente*): *Master's degree in Technical Medicine*, Faculty of Science and Technology, October 2011
- Frank Vos, Lex van Rossum, Ilse Kant, and Matthea van Dijk (*University of Twente*): *Bachelor's degree in Technical Medicine*, Faculty of Science and Technology, June 2011
- Marius van Voorden (*University of Twente*): *Bachelor's degree in Electrical Engineering*, Faculty of Electrical Engineering, Mathematics, and Computer Science, April 2010
- Gart de Bruin (*University of Twente*): *Master's degree in Mechatronics*, Faculty of Electrical Engineering, Mathematics, and Computer Science, March 2010

Public Media

Mechatronica & Machinebouw, *Biopsierobot stuurt flexibel naar doel*, 30 June 2016

Dagblad van het Noorden, *UMCG krijgt 7 ton voor robotchirurgie hersenen*, 4 December 2015

VPRO Television, *De Volmaakte Mens*, 20 May 2015

The ERC Starting Grant (*ROBOTAR*) got media attention (in print and online). Some press releases are listed below:
- Bits & Chips, *UT'er krijgt subsidie voor medische robot*, 2 December, 2014
- RTV Oost, *1.5 miljoen euro voor onderzoek met flexible naalden op UT Enschede*, 2 December, 2014
- Medical Device Technology, *Driving Through the Human Body with Magnets*, 2 December, 2014

The work on "MagnetoSperm" generated considerable media attention (in print, online, and radio). Below are some of the press releases out of more than 400 releases.
- BBC News, *Engineers control 'robotic sperm' with magnets*, 2 June 2014
- American Institute of Physics, *Here Come the "Brobots"*, 2 June 2014
- de Volkskrant *Nanorobotjes niet van sperma te onderscheiden*, 3 June 2014
- Los Angeles Times, *MagnetoSperm: A tiny swimming robot inspired by human sperm*, 3 June 2014

- Radio 1 Belgium, *Spermarobotjes?*, 6 June 2014
- NewScientist, *Twentse onderzoekers maken spermarobots*, July/August 2014
- Radio Norddeutscher Rundfunk (NDR): LOGO, 1 August 2014

NWT Magazine, *De zorg in 2040*, December 2012

De Twentsche Courant Tubantia, *CMI: jaarlijks diagnose voor 7000 patiënten*, 27 July 2012

RTV Oost, *Nieuw innovatiecentrum Universiteit Twente*, 19 October 2011

UT Nieuws, *Prostaatkanker: betere diagnose met flexibele naald*, 9 September 2010

Intermediair, *Radiologen hebben er een wapen bij*, 20 May 2010

Bits & Chips, *Miljoenensubsidie voor MRI-compatibele robotica*, 30 March 2010

List of Publications

Journal Articles

[J1] C. Pacchierotti, S. Scheggi, D. Prattichizzo, and **S. Misra**, "Haptic feedback for microrobotics applications: A review", *Frontiers in Robotics and AI, section Biomedical Robotics*, 2016. In Press. DOI:10.3389/frobt.2016.00053

[J2] G. J. Vrooijink, A. Denasi, J. G. Grandjean, and **S. Misra**, "Model predictive control of a robotically-actuated delivery sheath for beating heart compensation", *The International Journal of Robotics Research*. Accepted

[J3] F. Ongaro , S. Scheggi, C. Yoon , F. van den Brink , S. H. Oh , D. H. Gracias , and **S. Misra**, "Autonomous planning and control of soft untethered grippers for potential applications in dynamically-cluttered environments", *Journal of Micro-Bio Robotics*. In Press. DOI 10.1007/s12213-016-0091-1

[J4] P. Moreira, G. van de Steeg, T. Krabben, J. Zandman, E. E. G. Hekman, F. van der Heijden, R. J. H. Borra, and **S. Misra**, "MIRIAM robot: A novel robotic system for MR-guided needle insertion in the prostate", *Journal of Medical Robotics Research*, Vol. 2, No. 3, 1750006-1–1750006-13, 2017

[J5] M. Abayazid, T. Araújo, M. Rutten, and **S. Misra**, "Segmentation and three-dimensional reconstruction of lesions using the Automated Breast Volume Scanner (ABVS)", *The International Journal of Medical Robotics and Computer Assisted Surgery*, 2016. Accepted.

[J6] I. S. M. Khalil, H. C. Dijkslag, L. Abelmann and **S. Misra**, "Robust and optimal control of magnetic micro-particles inside microfluidic channels with time-varying flow rates", *International Journal of Advanced Robotic Systems*, 2016. Accepted.

[J7] M. Abayazid, P. Moreira, N. Shahriari, A. Zompas, and **S. Misra**, "Three-dimensional needle steering using Automated Breast Volume Scanner (ABVS)", *Journal of Medical Robotics Research*, Vol. 1, No. 1, pp. 1640005-1–1640005-9, March 2016.

[J8] R. J. Roesthuis and **S. Misra**, "Steering of multi-segment continuum manipulators using rigid-link modeling and FBG-based shape sensing"", *IEEE Transactions on Robotics*, Vol. 32, No. 2, pp. 372–382, April 2016.

[J9] M. Abayazid, C. Pacchierotti, P. Moreira, R. Alterovitz, D. Prattichizzo, and **S. Misra**, "Experimental evaluation of co-manipulated ultrasound-guided flexible needle steering", *The International Journal of Medical Robotics and Computer Assisted Surgery*. In Press. DOI:10.1002/rcs.1680

[J10] C. Pacchierotti, V. Magdanz, M. Medina Sánchez, O. G. Schmidt, D. Prattichizzo, and **S. Misra**, "Intuitive control of self-propelled microjets with haptic feedback", *Journal of Micro-Bio Robotics*, Vol. 10, No. 1–4, pp. 27–53, October 2015.

[J11] N. Shahriari, E. E. .G. Hekman, M. Oudkerk, and **S. Misra**, "Design and evaluation of a computed tomography- (CT-) compatible needle insertion device using an electromagnetic tracking system and CT images, *International Journal of Computer Assisted Radiology and Surgery*, Vol. 10, No. 11, pp. 1845–1852, October 2015.

[J12] W. Assaad, A. Jahya, P. Moreira, and **S. Misra**, "Finite-element modeling of a bevel-tipped needle interacting with gel", *Journal of Mechanics in Medicine and Biology*, Vol. 15, No. 5, pp. 1550079-1–15, October 2015.

[J13] P. Moreira and S. Misra, "Biomechanics-based curvature estimation for ultrasound-guided flexible needle steering in biological tissues", *Annals of Biomedical Engineering*, Vol. 43, No. 8, pp. 1716–1726, August 2015.

[J14] M. Abayazid, P. Moreira, N. Shahriari, S. Patil, R. Alterovitz, and **S. Misra**, "Ultrasound-guided three-dimensional needle steering in biological tissue with curved surfaces", *Medical Engineering & Physics*, Vol. 37, No. 1, pp. 145–150, January 2015.

[J15] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "Precise localization and control of catalytic Janus micromotors using weak magnetic fields", *International Journal of Advanced Robotic Systems*, Vol. 12, No. 2, pp. 1–7, January 2015.

[J16] C. Pacchierotti, M. Abayazid, **S. Misra** and D. Prattichizzo, "Teleoperation of steerable flexible needles by combining kinesthetic and vibratory feedback", *IEEE Transactions on Haptics*, Vol. 7, No. 4, pp. 551–556, October-December 2014.

[J17] I. S. M. Khalil, L. Abelmann, and **S. Misra**, "Magnetic-based motion control of paramagnetic microparticles with disturbance compensation", *IEEE Transactions on Magnetics*, Vol. 50, No. 10, pp. 5400110-1–10, October 2014.

[J18] G. J. Vrooijink, M. Abayazid, S. Patil, R. Alterovitz, and **S. Misra**, "Needle path planning and steering in a three-dimensional non-static environment using two-dimensional ultrasound images", *The International Journal of Robotics Research*, Vol. 33, No. 10, pp. 1361–1374, September 2014.

[J19] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "Biocompatible, accurate, and fully autonomous: A sperm-driven micro-bio-robot", *Journal of Micro-Bio Robotics*, Vol. 9, No. 3–4, pp. 79–86, August 2014.

[J20] I. S. M. Khalil, H. C. Dijkslag, L. Abelmann and **S. Misra**, "MagnetoSperm: A microrobot that navigates using weak magnetic fields", *Applied Physics Letters*, Vol. 104, No. 22, pp. 223701-1–223701-4, June 2014.

[J21] M. Abayazid, G. J. Vrooijink, S. Patil, R. Alterovitz, and **S. Misra**, "Experimental evaluation of ultrasound-guided 3D needle steering in biological tissue", *International Journal of Computer Assisted Radiology and Surgery*, Vol. 9, No. 6, pp. 931–939, November 2014.

[J22] R. J. Roesthuis, M. Kemp, J. J. van den Dobbelsteen, and **S. Misra**, "Three-dimensional needle shape reconstruction using an array of fiber bragg grating sensors", *IEEE/ASME Transactions on Mechatronics*, Vol. 19, No. 4, pp. 1115–1126, August 2014.

[J23] B. Peerdeman, M. Valori, D. M. Brouwer, E. E. G. Hekman, **S. Misra**, and S. Stramigioli, "UT hand I: a lock-based underactuated hand prosthesis", *Mechanism and Machine Theory*, Vol. 78,pp. 307–323, August 2014.

[J24] A. Jahya, M. G. Schouten, J. J. Futterer, and **S. Misra**, "On the importance of modeling organ geometry and boundary conditions for predicting three-dimensional prostate deformation", *Computer Methods in Biomechanics and Biomedical Engineering*, Vol. 17, No. 5, pp. 497–506, April 2014.

[J25] I. S. M. Khalil and **S. Misra**, "Control characteristics of magnetotactic bacteria: *Magnetospirillum magnetotacticum* strain MS-1 and *M. magneticum* strain AMB-1", *IEEE Transactions on Magnetics*, Vol. 50, No. 4, pp. 1-11, April 2014.

[J26] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "Wireless magnetic-based closed-loop control of self-propelled microjets", *PLoS ONE*, Vol. 9, No. 2, e83053, February 2014.

[J27] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "The control of self-propelled microjets inside a microchannel with time-varying flow rates", *IEEE Transactions on Robotics*, Vol. 30, No. 1, pp. 49–58, February 2014.

[J28] W. W. Koelmans, G. Krisnamoorthy, A. Heskamp, J. Wissink, **S. Misra**, and N. Tas, "Microneedles interacting with a double-layer skin model", *Mechanical Engineering Research*, Vol. 3, No. 2, pp. 51–63, December 2013.

[J29] P. Moreira, I. Peterlik, M. Herink, C. Duriez, S. Cotin, and **S. Misra**, "Modelling prostate deformation: SOFA versus experiments", *Mechanical Engineering Research*, Vol. 3, No. 2, pp. 64–72, December 2013.

[J30] A. Jahya, M. Herink, and **S. Misra**, "A framework for predicting 3D prostate deformation in real time", *The International Journal of Medical Robotics and Computer Assisted Surgery*, Vol. 9, No. 4, pp. e52–e60, December 2013.

[J31] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "Three-dimensional closed-loop control of self-propelled microjets", *Applied Physics Letters*, Vol. 103, No. 17, pp. 172404-1–172404-4, October 2013.

[J32] R. Reilink, S. Stramigioli, and **S. Misra**, "Image-based hysteresis reduction for the control of flexible endoscopic instruments", *Mechatronics*, Vol. 23, No. 6, pp. 652–658, September 2013.

[J33] I. S. M. Khalil, M. P. Pichel, L. Abelmann, and **S. Misra**, "Closed-loop control of magnetotactic bacteria", *The International Journal of Robotics Research*, Vol. 32, No. 6, pp. 636–648, May 2013.

[J34] B. Peerdeman, S. Stramigioli, E. E. G. Hekman, D. M. Brouwer, and **S. Misra**, "Development of underactuated fingers with joint locking and electromyographic control", *Mechanical Engineering Research*, Vol. 3, No. 1, pp. 130–142, April 2013.

[J35] R. Reilink, A. M. L. Kappers, S. Stramigioli, and **S. Misra**, "Evaluation of robotically controlled advanced endoscopic instruments", *The International Journal of Medical Robotics and Computer Assisted Surgery*, Vol. 9, No. 2, pp. 240–246, June 2013.

[J36] R. Reilink, S. Stramigioli, and **S. Misra**, "3D position estimation of flexible instruments: marker-less and marker-based methods", *International Journal of Computer Assisted Radiology and Surgery*, Vol. 8, No. 3, pp. 407–417, May 2013.

[J37] W. Assaad and **S. Misra**, "Combining ultrasound-based elasticity estimation and FE models to predict 3D target displacement", *Medical Engineering and Physics*, Vol. 35, No. 4, pp. 549–554, April 2013.

[J38] M. Abayazid, R. J. Roesthuis, R. Reilink, and **S. Misra**, "Integrating deflection models and image feedback for real-time flexible needle steering", *IEEE Transactions on Robotics*, Vol. 29, No. 2, pp. 542–553, April 2013.

[J39] Y. R. J. van Veen, A. Jahya, and **S. Misra**, "Macroscopic and microscopic observations of needle insertion into gels", *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, Vol. 226, No. 6, pp. 441–449, June 2012.

[J40] M. Franken, **S. Misra**, and S. Stramigioli, "Improved transparency in energy-based bilateral telemanipulation", *Mechatronics*, Vol. 22, No. 1, pp. 45–54, February 2012.

[J41] M. G. Schouten, J. G. R. Bomers, D. Yakar, H. Huisman, D. Bosboom, T. W. J. Scheenen, **S. Misra**, and J. J. Fütterer, "Evaluation of a robotic technique for transrectal MRI-guided prostate biopsies", *European Radiology*, Vol. 22, No. 2, pp. 476–483, February 2012.

[J42] J. op den Buijs, H. H. G. Hansen, R. G. P. Lopata, C. L. de Korte, and **S. Misra**, "Predicting target displacements using ultrasound elastography and finite element modeling", *IEEE Transactions on Biomedical Engineering*, Vol. 58, No. 11, pp. 3143–3155, November 2011.

[J43] M. Franken, S. Stramigioli, **S. Misra**, C. Secchi, and A. Macchelli, "Bilateral telemanipulation with time delays: a two-layer approach combining passivity and transparency", *IEEE Transactions on Robotics*, Vol. 27, No. 4, pp. 741–756, August 2011.

[J44] B. Peerdeman, D. Boere, H. Witteveen, R. Huis in 't Veld, H. Hermens, S. Stramigioli, H. Rietman, P. Veltink, and **S. Misra**, "Myoelectric forearm prostheses: state of the art from a user requirements perspective", *Journal of Rehabilitation Research and Development*, Vol. 48, No. 6, pp. 719–738, July 2011.

[J45] R. Reilink, S. Stramigioli, A. M. L. Kappers, and **S. Misra**, "Evaluation of flexible endoscope steering using haptic guidance", *The International Journal of Medical Robotics and Computer Assisted Surgery*, Vol. 7, No. 2, pp. 178–186, April 2011.

[J46] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Modeling of nonlinear elastic tissues for surgical simulation", *Computer Methods in Biomechanics and Biomedical Engineering*, Vol. 13, No. 6, pp. 811–818, December 2010.

[J47] **S. Misra**, K. B. Reed, B. W. Schafer, K. T. Ramesh, and A. M. Okamura, "Mechanics of flexible needles robotically steered through soft tissue", *The International Journal of Robotics Research*, Vol. 29, No. 13, pp. 1640–1660, November 2010.

[J48] J. J. Fütterer, **S. Misra**, and K. J. Macura, "MR imaging of the prostate: potential role of robots", *Imaging in Medicine*, Vol. 2, No. 5, pp. 583–592, October 2010.

[J49] **S. Misra**, K. J. Macura, K. T. Ramesh, and A. M. Okamura, "The importance of organ geometry and boundary constraints for planning of medical interventions ", *Medical Engineering & Physics*, Vol. 31, No. 2, pp. 195–206, March 2009.

[J50] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Modeling of tool-tissue interactions for computer-based surgical simulation: a literature review", *Presence: Teleoperators and Virtual Environments*, Vol. 17, No. 5, pp. 463–491, October 2008.

[J51] O. Ma, J. Wang, **S. Misra**, and M. Liu, "On the validation of SPDM task verification facility", *Journal of Robotic Systems*, Vol. 20, No. 5, pp. 219–235, January 2004.

Journal Articles Under Review

S. Scheggi, T. C. Krishna Kumar, C. Yoon, B. Sawaryn, G. van de Steeg, D. H. Gracias, and **S. Misra**, "Magnetic motion control and planning of untethered soft grippers using ultrasound image feedback", *Robotics and Automation Letters*.

[J52] N. Shahriari, W. Heerink, T. van Katwijk, E. Hekman, M. Oudkerk, and **S. Misra**, "Computed tomography (CT)-compatible remote center of motion needle steering robot: Fusing CT images and electromagnetic sensor data", *IEEE Transactions on Biomedical Engineering*.

[J53] F. Campisano, F. Gramuglia, I. Dawson, C. Lyne, M. Izmaylov, **S. Misra**, E. De Momi, D. Morgan, K. L.. Obstein,and P. Valdastri,"Ultra-low-cost endoscopy for gastric cancer screening in low-income countries", *IEEE Robotics and Automation Magazine*.

[J54] I. S. M. Khalil, M. A. Seif, A. H. El-Shaer, and **S. Misra**, "A magnetic bilateral telemanipulation system using paramagnetic microparticles for micromanipulation of nonmagnetic objects", *IEEE Transactions on Industrial Electronics*.

[J55] M. A. Seif, A. Hassan, A. Nassar, A. El-Shaer, **S. Misra**, and I. S. M. Khalil, "Micromanipulation of non-magnetic beads using a bilateral tele-manipulation robotic system and paramagnetic micro-particles", *Robotics and Automation Letters*.

[J56] C. Pacchierotti, F. Ongaro, F. van den Brink, C. Yoon, D. Prattichizzo, D. H. Gracias, and **S. Misra**, "Steering and control of miniaturized untethered soft magnetic grippers with haptic feedback", *IEEE Transactions on Automation Science and Engineering*.

[J57] L. Zondervan, O. Sardan Sukas, I. S. M. Khalil, M. P. Pichel, **S. Misra**, L. Abelmann, "Magnetic torque on microfabricated elements and magnetotactic bacteria", *Journal of Magnetism and Magnetic Materials*.

Book Chapters

[B1] I. S. M. Khalil and **S. Misra**, "Control of magnetotatic bacteria", in *Microbiorobotics: Biologically Inspired Microscale Robotic Systems*, M. Kim, A. Julius, and U. Cheang (Editors), Elsevier 2016. In Press

[B2] I. S. M. Khalil, R. M. Abdel-Kader, I. Gomaa, and **S. Misra**, "Magnetic-based contact and non-contact manipulation of cell mockups and biological MCF-7 cells", in *Smart Drug Delivery System*, A. D. Sezer (Editor), InTech, pages 219-235, February 2016.

[B3] I. S. M. Khalil, M. P. Pichel, L. Zondervan, L. Abelmann, and **S. Misra**, "Characterization and control of biological microrobots.", *Experimental Robotics: Proceedings of the 13th International Symposium on Experimental Robotics (ISER)*, Springer Tracts in Advanced Robotics

(STAR) 88, J. P. Desai, G. Dudek, O. Khatib, and V. Kumar (Editors), pp. 617–631, June 2012.

[B4] N. J. Cowan, K. Goldberg, G. S. Chirikjian, G. Fichtinger, R. Alterovitz, K. B. Reed, V. Kallem, W. Park, and **S. Misra**, and A. M. Okamura, "Robotic needle steering: Design, modeling, planning, and image guidance", *Surgical Robotics - System, Applications, and Visions*, J. Rosen, B. Hannaford, and R. Satava (Editors), pp. 557-582, Springer, First Edition, December 2010.

Refereed Conference Articles

[C1] S. Scheggi, C. Yoon, D. H. Gracias, and **S. Misra**, "Model-based tracking of miniaturized grippers using particle swarm optimization", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, pp. 454–459, Daejeon, Korea, October 2016.

[C2] I. S. M. Khalil, Y. Michel, B. Su, and **S. Misra**, "Feeling paramagnetic micro-particles trapped in gas bubbles: A tele-manipulation study", in *Proceedings of the 6th International Conference on Manipulation, Manufacturing, Measurement on the Nanoscale (3M-NANO)*, pp. 225–230, Chongqing, China, July 2016.

[C3] A. Denasi and **S. Misra**, "A Robust controller for microsized agents – The prescribed performance approach", in *Proceedings of the Annual International Conference on Manipulation, Automation, and Robotics at Small Scales (MARSS)*, Paris, France, July 2016. Accepted.

[C4] S. Scheggi and **S. Misra**, "An experimental comparison of path planning techniques applied to micro-sized magnetic agents", in *Proceedings of the Annual International Conference on Manipulation, Automation, and Robotics at Small Scales (MARSS)*, Paris, France, July 2016. Accepted.

[C5] F. Ongaro, C. Yoon, F. van den Brink, M. Abayazid, S. H. Oh, D. H. Gracias, and **S. Misra**, "Control of soft untethered grippers for pick-and-place tasks", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 299–304, Singapore, June 2016.

[C6] H. Abbass, M. S. Shoukry, A. Klingner, A. Hosney, **S. Misra**, and I. S. M. Khalil, "Robust motion control of paramagnetic micro-particles against time-varying flow rates", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 67–72, Singapore, June 2016.

[C7] F. Ongaro, C. Pacchierotti, C. Yoon, D. Prattichizzo, D. H. Gracias, and **S. Misra**, "Evaluation of electromagnetic system with haptic feedback for control of untethered, soft grippers affected by disturbances", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 908–913, Singapore, June 2016.

[C8] G. J. Vrooijink, M. P. Jansen, M. L. Tolhuisen, J. G. Grandjean, and **S. Misra**, "Ultrasound-guided stabilization of a robotically-actuated delivery sheath (RADS) for beating heart mitral valve motions", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 73–79, Singapore, June 2016

[C9] K.J. Boskma, S. Scheggi, and **S. Misra**, "Closed-loop control of a magnetically-actuated catheter using two-dimensional ultrasound images", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 61–66, Singapore, June 2016.

[C10] N. Shahriari, R. J. Roesthuis, N. J. van de Berg, J. J. van den dobbelsteen, and **S. Misra**, "Steering an actuated-tip needle in biological tissue: Fusing FBG-sensor data and ultrasound images", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, pp. 4443–4449, May 2016.

[C11] A. Hosney, A. Klingner, **S. Misra**, and I. S. M. Khalil, "Propulsion and steering of helical magnetic microrobots using two synchronized rotating dipole fields in three-dimensional space", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, pp. 1988–1993, September-October 2015.

[C12] P. Moreira, M. Abayazid, and **S. Misra**, "Towards physiological motion compensation for flexible needle interventions", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, pp. 831–836, September-October 2015.

[C13] A. El-Gazzar, L. Al-khouly, A. Klingner, **S. Misra**, and I. S. M. Khalil, "Non-contact manipulation of microbeads via pushing and pulling using magnetically controlled clusters of paramagnetic microparticles", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, pp. 778–783, September-October 2015.

[C14] N. A. Patel, T. van Katwijk, G. Li, P. Moreira, W. Shang, **S. Misra**, and G. S. Fischer, "Closed-loop asymmetric-tip needle steering under continuous intraoperative MRI guidance", in *Proceedings of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Milan, Italy, pp. 4869–4874, August 2015.

[C15] R. J. Roesthuis, N. J. van de Berg, J. J. van den dobbelsteen, and **S. Misra**, "Modeling and steering of a novel actuated-tip needle through a soft-tissue simulant using fiber bragg grating sensors", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, USA, pp. 2284–2289, May-June 2015.

[C16] K. Youakim, M. Ehab, O. Hatem, **S. Misra**, and I. S. M. Khalil, "Paramagnetic microparticles sliding on a surface: characterization and closed-loop motion control", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, USA, pp. 4068–4073, May-June 2015.

[C17] I. S. M. Khalil, K. Youakim, A. Sanchez , and **S. Misra**, "Magnetic-based motion control of sperm-shaped microrobots using weak oscillating magnetic fields", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Chicago, USA, pp. 4686–4691, September 2014.

[C18] C. Pacchierotti, M. Abayazid, **S. Misra**, and D. Prattichizzo, "Steering of flexible needles combining kinesthetic and vibratory force feedback", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Chicago, USA, pp. 1202–1207, September 2014.

[C19] M. E. Alshafeei, A. Hosney, A. Klingner, **S. Misra** and I. S. M. Khalil, "Magnetic-based motion control of a helical robot using two synchronized rotating dipole fields", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, São Paulo, Brazil, pp. 151–156, August 2014.

[C20] A. Sánchez , V. Magdanz, O. G. Schmidt, and **S. Misra**, "Magnetic control of self-propelled microjets under ultrasound image guidance", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, São Paulo, Brazil, pp. 169–174, August 2014.

[C21] P. Moreira, G. van de Steeg, F. van der Heijden, J. J. Fütterer, and **S. Misra**, "A preliminary evaluation of a flexible needle steering algorithm using magnetic resonance images as feedback", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, São Paulo, Brazil, pp. 314–319, August 2014.

[C22] M. Abayazid, N. Shahriari, and **S. Misra**, "Three-dimensional needle steering towards a localized target in a prostate phantom", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, São Paulo, Brazil, pp. 7–12, August 2014.

[C23] P. Moreira, S. Patil, R. Alterovitz, and **S. Misra**, "Needle steering in biological tissue using ultrasound-based online curvature estimation", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 4368–4373, May-June 2014.

[C24] G. J. Vrooijink, T. T. M. Ellenbroek, P. Breedveld, J. G. Grandjean, and **S. Misra**, "A preliminary study on using a robotically-actuated delivery sheath (RADS) for transapical aortic valve implantation", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 4380–4386, May-June 2014.

[C25] I. S. M. Khalil, P. Ferreira, R. Eleutério, C. L. de Korte, and **S. Misra**, "Magnetic-based closed-loop control of paramagnetic microparticles using ultrasound feedback", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 3807–3812, May-June 2014.

[C26] W. Sun, I. S. M. Khalil, **S. Misra**, and R. Alterovitz, "Motion planning for paramagnetic microparticles under motion and sensing uncertainty", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 5811–5817, May-June 2014.

[C27] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, and **S. Misra**, "Magnetotactic bacteria and microjets: a comparative study", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, pp. 2035–2040, November 2013.

[C28] R. J. Roesthuis, S. L. Janssen, and **S. Misra**, "On using an array of fiber bragg grating sensors for closed-loop control of flexible minimally invasive surgical instruments", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, pp. 2545–2551, November 2013.

[C29] I. S. M. Khalil, R. M. P. Metz, B. A. Reefman, and **S. Misra**, "Magnetic-based minimum input motion control of paramagnetic microparticles in three-dimensional space", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, pp. 2053–2058, November 2013.

[C30] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, L. Abelmann, and **S. Misra**, "Magnetic control of potential microrobotic drug delivery systems: nanoparticles, magnetotactic bacteria and self-propelled microjets", in *Proceedings of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 5299–5302, Osaka, Japan, July 2013.

[C31] G. J. Vrooijink, M. Abayazid, and **S. Misra**, "Real-time three-dimensional flexible needle tracking using two-dimensional ultrasound", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, pp. 1680–1685, May 2013.

[C32] I. S. M. Khalil, M. P. Pichel, B. A. Reefman, O. S. Sukas, L. Abelmann, and **S. Misra**, "Control of magnetotactic bacterium in a micro-fabricated maze", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, pp. 5488–5493, May 2013.

[C33] M. Abayazid, M. Kemp, and **S. Misra**, "3D flexible needle steering in soft-tissue phantoms using fiber bragg grating sensors", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, pp. 5823–5829, May 2013.

[C34] I. S. M. Khalil, F. van den Brink, O. S. Sukas, L. Abelmann, and **S. Misra**, "Microassembly using a cluster of paramagnetic microparticles", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, pp. 5507–5512, May 2013.

[C35] I. S. M. Khalil, L. Abelmann, and **S. Misra**, "Interaction force estimation during manipulation of microparticles", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, pp. 950–956, October 2012.

[C36] I. S. M. Khalil, A. Sabanovic, and **S. Misra**, "An energy-based state observer for dynamical subsystems with inaccessible state variables", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, pp. 3734–3740, October 2012.

[C37] M. Abayazid, J. op den Buijs, C. L. de Korte, and **S. Misra**, "Effect of skin thickness on target motion during needle insertion into soft-tissue phantoms", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 755–760, June 2012.

[C38] B. Peerdeman, G. J. Pieterse, S. Stramigioli, J. S. Rietman, E. E. G. Hekman, D. M. Brouwer, and **S. Misra**, "Design of joint locks for underactuated fingers", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 488–493, June 2012.

[C39] I. S. M. Khalil, J. D. Keuning, L. Abelmann, and **S. Misra**, "Wireless magnetic-based control of paramagnetic microparticles", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 460–466, June 2012.

[C40] A. Jahya, F. van der Heijden, and **S. Misra**, "Observations of three-dimensional needle deflection during insertion into soft tissue", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 1205–1210, June 2012.

[C41] R. J. Roesthuis, M. Abayazid, and **S. Misra**, "Mechanics-based model for predicting in-plane needle deflection with multiple bends", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 69–74, June 2012.

[C42] B. Peerdeman, G. Smit, S. Stramigioli, D. H. Plettenburg, and **S. Misra**, "Evaluation of pneumatic cylinder actuators for hand prostheses", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 1104–1109, June 2012.

[C43] B. Peerdeman, U. Fabrizi, G. Palli, C. Melchiorri, S. Stramigioli, and **S. Misra**, "Development of prosthesis grasp control systems on a robotic testbed", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 1110–1115, June 2012.

[C44] N. van der Stap, R. Reilink, **S. Misra**, I. A. M. J. Broeders, and F. van der Heijden, "The use of the focus of expansion for automated steering of flexible endoscopes", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, pp. 13–18, June 2012.

[C45] R. Reilink, S. Stramigioli, and **S. Misra**, "Pose reconstruction of flexible instruments from endoscopic images using markers", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, USA, pp. 2938–2943, May 2012.

[C46] M. Franken, **S. Misra**, and S. Stramigioli, "Stability of position-based bilateral telemanipulation systems by damping injection", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, USA, pp. 4300–4306, May 2012.

[C47] R. J. Roesthuis, Y. R. J. van Veen, A. Jahya, and **S. Misra**, "Mechanics of needle-tissue interaction", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, pp. 2557–2563, September 2011.

[C48] J. D. Keuning, J. de Vries, L. Abelmann, and **S. Misra**, "Image-based magnetic control of paramagnetic microparticles in water", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, pp. 421–426, September 2011.

[C49] R. Reilink, S. Stramigioli, and **S. Misra**, "Three-dimensional shape reconstruction of flexible instruments from endoscopic images", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, pp. 2076–2082, September 2011.

[C50] N. Kuperij, R. Reilink, M. P. Schwartz, S. Stramigioli, **S. Misra**, and I. A. M. J. Broeders, "Design of a user interface for intuitive colonoscope control", in *Proceedings of the IEEE*

International Conference on Intelligent Robots and Systems (IROS), San Francisco, USA, pp. 937–942, September 2011.

[C51] J. op den Buijs, M. Abayazid, C. L. de Korte, and **S. Misra**, "Target motion predictions for pre-operative planning during needle-based interventions", in *Proceedings of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 5380–5385, Boston, USA, August-September 2011.

[C52] M. Franken, B. Willaert, **S. Misra**, and S. Stramigioli, "Bilateral telemanipulation: improving the complimentarily of the frequency- and time-domain passivity approaches", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pp. 2104–2110, Shanghai, China, May 2011.

[C53] R. Reilink, S. Stramigioli, and **S. Misra**, "Image-based flexible endoscope steering", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, pp. 2339–2344, October 2010.

[C54] M. Franken, **S. Misra**, and S. Stramigioli, "Friction compensation in energy-based bilateral telemanipulation", in *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, pp. 5264–5269, October 2010.

[C55] R. Reilink, G. de Bruin, M. Franken, M. Mariani, **S. Misra**, and S. Stramigioli, "Endoscopic camera control by head movements for thoracic surgery", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Tokyo, Japan, pp. 510–515, September 2010.

[C56] B. Peerdeman, D. van Baal, L. Kallenberg, S. Stramigioli, and **S. Misra**, "A biomechanical model for the development of myoelectric hand prosthesis control systems", in *Proceedings of the IEEE International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Buenos Aires, Argentina, pp. 519–523, August-September 2010.

[C57] M. Franken, R. Reilink, **S. Misra**, and S. Stramigioli, "Multi-dimensional passive sampled port-hamiltonian systems", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1320–1326, Anchorage, USA, May 2010.

[C58] **S. Misra**, K. B. Reed, K. T. Ramesh, and A. M. Okamura, "Observations of needle-tissue interactions", in *Proceedings of the IEEE International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Minneapolis, USA, pp. 262–265, September 2009.

[C59] **S. Misra**, K. B. Reed, B. W. Schafer, K. T. Ramesh, and A. M. Okamura, "Observations and models for needle-tissue interactions", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, Japan, pp. 2687–2692, May 2009.

[C60] **S. Misra**, P. Fuernstahl, K. T. Ramesh, A. M. Okamura and M. Harders, "Quantifying perception of nonlinear elastic tissue models using multidimensional scaling", in *Proceedings of the 3rd Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems (World Haptics)*, Salt Lake City, USA, pp. 570–575, March 2009.

[C61] **S. Misra**, K. B. Reed, A. S. Douglas, K. T. Ramesh, and A. M. Okamura, "Needle-tissue interaction forces for bevel-tip steerable needles", in *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, Scottsdale, USA, pp. 224–231, October 2008.

[C62] Z. Pezzementi, D. Ursu, **S. Misra**, and A. M. Okamura, "Modeling realistic tool-tissue Interactions with haptic feedback: a learning-based method", in *Proceedings of the 16th Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems (IEEE Virtual Reality)*, Reno, USA, pp. 209–215, March 2008.

[C63] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Physically valid surgical simulators: linear versus nonlinear tissue models", in *Proceedings of the Medicine Meets Virtual Reality 16 Conference*, Long Beach, USA, pp. 293-295, January 2008.

[C64] **S. Misra**, A. M. Okamura, and K. T. Ramesh, "Force feedback is noticeably different for linear versus nonlinear elastic tissue models", in *Proceedings of the 2nd Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems (World Haptics)*, Tsukuba, Japan, pp. 519–524, March 2007.

[C65] **S. Misra** and A. M. Okamura, "Environment parameter estimation during bilateral telemanipulation", in *Proceedings of the 14th Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems (IEEE Virtual Reality)*, Alexandria, USA, pp. 301-307, March 2006.

[C66] O. Ma, M. Liu, **S. Misra**, and J. Wang, "Validation plan for SPDM task verification facility", in *Proceedings of the 7th International Symposium on Artificial Intelligence, Robotics and Automation in Space (I-SAIRAS)*, Nara, Japan, I-SAIRAS Paper AM-21, pp. 1–8, May 2003.

[C67] **S. Misra** and A. K. Misra, "Object-oriented modeling of the dynamics of space systems with reaction wheels", in *Proceedings of the AIAA Modeling and Simulation Technologies Conference and Exhibit*, Monterey, USA, AIAA Paper 2002-5043, pp. 1–11, August 2002.

Refereed Conference Articles Under Review

[C68] S. Scheggi, T. C. Krishna Kumar, C. Yoon, B. Sawaryn, G. van de Steeg, D. H. Gracias, and **S. Misra**, "Magnetic motion control and planning of untethered soft grippers using ultrasound image feedback", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 2017.

[C69] J. Sikorski, I. Dawson, A. Denasi, E. E G. Hekman, and **S. Misra**, "Introducing BigMag – A novel system for 3D magnetic actuation of flexible surgical manipulators", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 2017.

[C70] P. Moreira , K. J. Boskma, and **S. Misra**, "Towards MRI-guided flexible needle steering using Fiber Bragg Grating-based tip tracking", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 2017.

Abstracts / Video Submissions

[A1] P. Moreira and **S. Misra**, "MRI-guided flexible needle steering Using fiber Bragg Grating-based tip tracking", in *Proceedings of the 6th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2017.

[A2] F. Khan, R. Roesthuis, and **S. Misra**, "Force sensing in minimally invasive medical devices", in *Proceedings of the 6th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2017.

[A3] C. Yoon, F. Ongaro, **S. Misra**, and D. H. Gracias, "Stimuli responsive organic and inorganic nanomaterials for biomedical applications and biosafety", in *Proceedings of the Materials Research Society (MRS) Fall Meeting and Exhibit*, Boston, USA, November-December 2016.

[A4] L. Kuil, P. Moreira, and **S. Misra**, "Tele-operated MR-compatible robot for prostate interventions", in *Proceedings of the 28th Conference of the international Society for Medical Innovation and Technology (iSMIT2016)*, Delft, Netherlands, October 2016.

[A5] F. Campisano, F. Gramuglia, I. Dawson, K. L.. Obstein, **S. Misra**, E. De Momi, and P. Valdastri, "Water jet actuation for ultra-low cost endoscopy: Characterization of miniature nozzles fabricated by rapid prototyping", in *Proceedings of the Eurosensors Conference*, Budapest, Hungary, September 2016.

[A6] F. Ongaro, S. Scheggi, C. Yoon, G. van de Steeg, T. C. Krishna Kumar, S. H. Oh, D. H. Gracias, and **S. Misra**, "Ultrasound-based tracking and closed-Loop control of soft self-folding hydrogel grippers", in *Proceedings of the Advanced Functional Polymers for Medicine Conference*, Enschede, Netherlands, page 103, June 2016.

[A7] I. Dawson, F. Campisano, F. Gramuglia, K. L. Obstein, E. Hekman, J. Sikorski, **S. Misra**, and P. Valdastri, "Modeling and validation of a low-cost soft-tethered endoscopic platform", in *Proceedings of the Hamlyn Symposium on Medical Robotics*, London, UK, pp. 90–91, June 2016.

[A8] P. Moreira and **S. Misra**, "MR-compatible robot for needle-based prostate interventions", in *Proceedings of the Hamlyn Symposium on Medical Robotics*, London, UK, pp. 7–8, June 2016.

[A9] C. Yoon, F. Ongaro, S. Scheggi, S. H. Oh, **S. Misra**, and D. H. Gracias, "Soft, miniaturized untethered grippers for pick and place applications", in *Proceedings of the Mid-Atlantc Micro/Nano Alliance (MAMNA) Spring Symposium*, Laurel, USA, March 2016.

[A10] C. Yoon , F. van den Brink , R. Xiao, T. D. Nguyen, **S. Misra**, D. H. Gracias, "Untethered thermo-magnetically responsive hydrogel microgrippers", in *Proceedings of the Materials Research Society (MRS) Fall Meeting and Exhibit*, Boston, USA, November-December 2015.

[A11] C. Pacchierotti, V. Magdanz, M. Medina Sánchez, O. G. Schmidt, D. Prattichizzo, and **S. Misra**, "Teleoperation of self-propelled microjets with haptic feedback", in *Proceedings of the IEEE World Haptics Conference: Work-in-Progress*, Chicago, USA, June 2015.

[A12] N. J. van de Berg, R. J. Roesthuis, **S. Misra**, and J. J. van den dobbelsteen, "Haptic shared control of a teleoperated steerable needle", in *Proceedings of the IEEE World Haptics Conference: Work-in-Progress*, Chicago, USA, June 2015.

[A13] M. Abayazid, A. Zompas, and **S. Misra**, "Three-dimensional flexible needle steering using an automated breast volume ultrasound scanner", in *Proceedings of the 5th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2015.

[A14] G. J. Vrooijink, J. G. Grandjean, and **S. Misra**, "Closed-loop control of a robotically-actuated delivery sheath (RADS) for cardiovascular applications", in *Proceedings of the 5th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2015.

[A15] N. Shahriari , E. E. G. Hekman and **S. Misra**, "Design and control of a CT-compatible needle steering system", in *Proceedings of the Design of Medical Devices Conference-Europe*, Delft, Netherlands, pp. 104–105, October 2014.

[A16] A. Sánchez , Y. M. Sadek, I. S. M. Khalil, and **S. Misra**, "Mobi-Mag: A compact device for medical research using wireless control of magnetic microrobots", in *Proceedings of the Design of Medical Devices Conference-Europe*, Delft, Netherlands, pp. 100–101, October 2014.

[A17] **S. Misra** and A. Sánchez, "Wireless control of micro-sized magnetic agents", in *Proceedings of the International Workshop on Micro- and Nanomachines*, Hannover, Germany, July 2014.

[A18] M. Pichel, L. Zondervan, I. S. M. Khalil, **S. Misra**, and L. Abelmann, "Magnetic and viscous drag torque of microfabricated elements and magnetotactic bacteria", in *Proceedings of the International Magnetics Conference (INTERMAG)*, Dresden, Germany, May 2014.

[A19] M. Pichel, I. S. M. Khalil, and **S. Misra**, "Realization and control of a swarm of magnetotactic bacteria", in *Proceedings of the 4th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2013.

[A20] G. J. Vrooijink, M. Abayazid, S. Patil, R. Alterovitz, and **S. Misra**, "Three-dimensional flexible needle steering using two-dimensional ultrasound images", in *Proceedings of the 4th Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2013.

[A21] N. van der Stap, R. Reilink, I. A. M. J. Broeders, **S. Misra**, and F. van der Heijden, "A feasibility study of optical flow-based navigation during colonoscopy", in *Proceedings of Computer Assisted Radiology and Surgery (CARS) Congress (International Journal of CARS)*, 7 (Supplement 1): S235, Pisa, Italy, June 2012.

[A22] R. Reilink, S. Stramigioli, and **S. Misra**, "Image-based pose estimation of an endoscopic instrument", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, USA, pp. 3555–3556, May 2012.

[A23] I. S. M. Khalil, L. Abelmann, and **S. Misra**, "Control system design for wireless electromagnetic-based micromanipulation system", in *Proceedings of the 31st Benelux Meeting on Systems and Control*, Heijen/Nijmegen, The Netherlands, March 2012.

[A24] M. Abayazid, R. Reilink, and **S. Misra**, "Image-guided flexible bevel-tip needle control", in *Proceedings of the 5th Annual Symposium of the Benelux Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Leuven, Belgium, December 2011.

[A25] B. Peerdeman, S. Stramigioli, E. Hekman, D. M. Brouwer, and **S. Misra**, "Mechanical design and control of a new myoelectric hand prosthesis', in *Proceedings of the 5th Annual Symposium of the Benelux Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Leuven, Belgium, December 2011.

[A26] A. Jahya, F. van der Heijden, and **S. Misra**, "Effects of bevel angle on 3D needle deflection: macroscopic and microscopic observations", in *Proceedings of the 5th Annual Symposium of the Benelux Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Leuven, Belgium, December 2011.

[A27] A. Jahya and **S. Misra**, "Microscopic observations of needle and soft-tissue simulant interactions", in *Proceedings of the International Society of Biomechanics (ISB) Congress*, Brussels, Belgium, July 2011.

[A28] J. de Vries, J. D. Keuning, L. Zondervan, **S. Misra**, and L. Abelmann, "Image-based magnetic control of self-propelling micro motors", in *Proceedings of the 22nd Micromechanics and Micro Systems Europe (MME)*, Toensberg, Norway, June 2011.

[A29] B. Peerdeman, U. Fabrizi, G. Palli, C. Melchiorri, S. Stramigioli, and **S. Misra**, "Evaluation of prosthesis grasp control systems on the UB hand IV", in *Proceedings of the 2nd International Symposium on Compliant Mechanisms*, Delft, Netherlands, May 2011.

[A30] R. J. Roesthuis, Y. R. J. van Veen, A. Jahya, and **S. Misra**, "Mechanics of needle-tissue interaction", in *Proceedings of the 2nd International Symposium on Compliant Mechanisms*, Delft, Netherlands, May 2011.

[A31] N. van der Stap, R. Reilink, I. A. M. J. Broeders, **S. Misra**, and S. Stramigioli, "Development of a semi-automated robot-assisted flexible endoscope", in *Proceedings of the 6th International Congress of the Minimally Invasive Robotics Association (MIRA)*, Athens, Greece, May 2011.

[A32] M. G. Schouten, J. G. R. Bomers, D. Yakar, H. Huisman, D. Bosboom, T. W. J. Scheenen, **S. Misra**, and J. J. Fütterer, "Evaluation of a robotic technique for transrectal MRI-guided prostate biopsies", in *Proceedings of the 19th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Montreal, Canada, May 2011.

[A33] J. op den Buijs, C. L. de Korte, and **S. Misra**, "Patient-specific biomechanical models for computer-assisted minimally invasive surgery", in *Proceedings of the 3rd Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2011.

[A34] B. Peerdeman, S. Stramigioli, and **S. Misra**, "Grasp control for myoelectric hand prostheses", in *Proceedings of the 3rd Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2011.

[A35] R. Reilink, S. Stramigioli, A. M. L. Kappers, and **S. Misra**, "Robotically steering flexible endoscopes for NOTES", in *Proceedings of the 3rd Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2011.

[A36] M. G. Schouten, J. G. R. Bomers, D. Yakar, H. Huisman, D. Bosboom, T. W. J. Scheenen, **S. Misra**, and J. J. Fütterer, "Evaluation of a robotic technique for transrectal MRI-guided prostate biopsies", in *Proceedings of the 3rd Dutch Biomedical Engineering Conference*, Egmond aan Zee, The Netherlands, January 2011.

Workshop Presentations / Papers

[W1] P. Moreira, G. van de Steeg, T. Krabben, J Zandman, J. Heidkamp, K. Overduin, E. E. G. Hekman, F. van der Heijden, and **S. Misra**, "Preliminary evaluation of a robot for MRI-guided needle interventions", *5rd Joint Workshop on New Technologies for Computer/Robot Assisted Surgery*, Brussels, Belgium, September 2015.

[W2] A. Sánchez and **S. Misra**, "Wireless control of micro-sized magnetic agents", *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Crossing the Reality Gap: Control, Human Interaction and Cloud Technology for Multi- and Many-Robot Systems*, Hong Kong, China, May-June 2014.

[W3] I. S. M. Khalil, V. Magdanz, S. Sanchez, O. G. Schmidt, L. Abelmann, and **S. Misra**, "Magnetic control of potential microrobotic drug delivery systems", *3rd Joint Workshop on New Technologies for Computer/Robot Assisted Surgery*, Verona, Italy, September 2013.

[W4] **S. Misra**, "Predicting target motions for planning of medical interventions", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): Workshop on Image-Guided Medical Robotic Interventions*, San Francisco, September-October 2011.

[W5] J. D. Keuning, J. de Vries, L. Abelmann, and **S. Misra**, "Image-based magnetic control of paramagnetic microparticles in water", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): Workshop on Image-Guided Medical Robotic Interventions*, San Francisco, September-October 2011.

[W6] R. Reilink, S. Stramigioli, A. M. L. Kappers, and **S. Misra**, "Steering flexible endoscopes for NOTES using haptic guidance", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop on Image-Guided Medical Robotic Interventions*, San Francisco, September-October 2011.

[W7] **S. Misra**, "Robotically steering flexible endoscopes for NOTES", *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Mechanisms for Surgical Robotics*, Shanghai, China, May 2011.

[W8] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Factors affecting needle-tissue interaction", *NSF Engineering Research Center for Computer-Integrated Surgical Systems and Technology Graduation Celebration*, The Johns Hopkins University, Baltimore, USA, January 2009.

[W9] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Factors affecting needle and tissue interaction models (i) organ geometry and boundary constraints and (ii) needle tip shape", *Medical Image Computing and Computer-Assisted Intervention (MICCAI) Workshop on Needle Steering: Recent Results and Future Opportunities*, New York, USA, September 2008.

[W10] **S. Misra**, K. T. Ramesh, and A. M. Okamura, "Tissue modeling for surgical simulation and planning", *Innovations in the Surgical Environment*, Baltimore, USA, June 2008.

[W11] **S. Misra** and A. M. Okamura, "Reality-based modeling for simulation and robot-assisted surgery ", *Workshop on Scientific Computing Applications in Surgical Simulation of Soft Tissues*, Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, USA, January 2008.

Theses

[T1] **S. Misra**,"Realistic models for surgical simulation and planning", *Doctor of Philosophy*, Department of Mechanical Engineering, The Johns Hopkins University, USA, June 2009.

[T2] **S. Misra**,"Object-oriented modeling of the dynamics of space systems with reaction wheels", *Master of Engineering*, Department of Mechanical Engineering, McGill University, Canada, July 2001.