Ehsan Noohi Bezanjani

University of Illinois at Chicago
Department of ECE (M/C 154)
1020 Science and Engineering Offices
851 South Morgan Street
Chicago, IL 60607-7053

Office: 4211 SEL-W
Email: enoohi2@uic.edu
Homepage: http://enoohi2.people.uic.edu
Phone: (312)927-0642

Research Interests

I am interested in developing robots that are capable of working in collaboration with humans. My approach to this problem is to develop interaction models by studying human cooperation and subsequently control the robot to emulate human-partner's behavior.

Education

Ph.D. Candidate, ECE Department, University of Illinois at Chicago   2011 – present

    GPA 4.0/4.0

Ph.D. Electrical Engineering (Robotics), University of Tehran   2004 – 2010

    Dissertation: *Kinematic Analysis of Wheeled-tip Manipulators*.

M.S. Electrical Engineering (Control), K.N.Toosi University of Technology   1999 – 2002

    Thesis: *Sensorless Vector Control of PMS Motors*.

B.S. Electrical Engineering (Electronics), University of Tehran   1995 – 1999

    Thesis: *Voice Compression Software for WEB Applications*

Publications

Book Chapter:

B1. **E. Noohi** and M. Žefran, "Estimating Human Intention during a Human-Robot Cooperative Task Based on the Internal Force Model", (*appearing in*) Trends in Control and Decision-Making for Human-Robot Collaboration Systems, Yue Wang and Fumin Zhang (Eds.), Springer, Berlin Heidelberg, 2017.

Refereed Journal Papers:

J4. **E. Noohi**, M. Žefran and J. L. Patton , "A Model for Human-Human Collaborative Object Manipulation and Its Application to Human-Robot Interaction". IEEE Transaction on Robotics (Special Issue on Movement Science for Humans and Humanoids), Vol. 32, Issue 4, August 2016, pp. 880-896.

J3. **E. Noohi**, H. Moradi, S. Parastegari and M. Nili Ahmadabadi, "Object Manipulation Using Unlimited Rolling Contacts: 2D Kinematic Modeling and Motion Planning". IEEE Transaction on Robotics, Vol. 31, Issue 3, April 2015, pp. 790-797.

J2. **E. Noohi**, H. Moradi, N. Noori and M. Nili Ahmadabadi, "Manipulation of Polygonal Objects with Two Wheeled-tip Fingers: Planning in Presence of Contact Position Error". Elsevier, Robotics and Autonomous Systems, Vol. 59, Issue 1, January 2011, pp. 44-55.

J1. **E. Noohi**, S. Mahdavi, A. Baghani and M. Nili Ahmadabadi, "Wheel-Based Climbing Robot: Modeling and Control". Advanced Robotics, Vol. 24, No. 8-9, May 2010, pp. 1313-1343.

Refereed Conference Papers:

C13. **E. Noohi** and M. Žefran, "Modeling the Interaction Force During a Haptically-Coupled Cooperative Manipulation", 25th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), pages 119–124, Columbia University, NY, USA, August 26-31, 2016.

C12. B. Abbasi, **E. Noohi**, S. Parastegari and M. Žefran, "Grasp Taxonomy Based on Force Distribution", 25th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), pages 1098–1103, Columbia University, NY, USA, August 26-31, 2016.

C11. S. Parastegari, **E. Noohi**, B. Abbasi and M. Žefran, "A Fail-safe Object Handover Controller", IEEE International Conference on Robotics and Automation (ICRA'16), pages 2003–2008, Stockholm, Sweden, May 16-21, 2016.

C10. **E. Noohi**, S. Parastegari, and M. Žefran, "Computational Model for Dyadic and Bimanual Reaching Movements", IEEE World Haptic Conference (WHC'15), pages 260–265, Northwestern University, Evanston, IL, June 22-25, 2015.

C9. **E. Noohi** and M. Žefran, "Quantitative Measures of Cooperation for a Dyadic Physical Interaction Task," in International Conference on Humanoid Robots (Humanoids'14), pages 469–474, Madrid, Spain, Nov. 18-20, 2014.

C8. **E. Noohi**, S. Parastegari, and M. Žefran, "Using Monocular Images to Estimate Interaction Forces During Minimally Invasive Surgery", 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'14), pages 4297–4302, Chicago, IL, Sept. 14-18, 2014.

C7. S. Parastegari, M. Nili Ahmadabadi, **E. Noohi** and H. Moradi, "Wheeled-tip Object Manipulation: Modeling and Motion Planning of Throwing an Object", In Proceedings of IEEE International Conference on Robotics and Biomimetics (ROBIO'12), pages 1800-1805, Dec. 11-14 2012.

C6. K. Fang, N. Iliev, **E. Noohi**, S. Zhang, and Z. Zhu, "Thread-Fair Memory Request Reordering", 3rd JILP Workshop on Computer Architecture Competitions (JWAC-3): Memory Scheduling Championship (MSC), Portland, OR, USA, June 9-13, 2012.

C5. N. Noori, **E. Noohi**, H. Moradi, A.H. Bakhtiary, and M. Nili Ahmadabadi. "A Probabilistic Roadmap Based Planning Algorithm for Wheeled-tip Robots Manipulating Polygonal Objects". In Proceedings of ASME/IEEE International Conference on Advanced Intelligent Mechatronics (AIM'09), pages 1040–1046, Singapore, July 14-17, 2009.

C4. **E. Noohi**, H. Moradi, and M. Nili Ahmadabadi. "Manipulation Using Wheeled Tips: Benefits and Challenges". In Proceedings of 39th International Symposium on Robotics (ISR'08), pages 442–447, Seoul, South Korea, October 15-17, 2008.

C3. S. Mahdavi, **E. Noohi** and M. Nili Ahmadabadi, "Basic Movement of a Nonholonomic Wheel-based Pole Climbing Robot". In Proceedings of IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'07), ETH Zurich, Switzerland, Sept 4–7 2007.

C2. S. Mahdavi, **E. Noohi**, and M. Nili Ahmadabadi, "Path Planning of the Nonholonomic Pole Climbing Robot UT-PCR". In Proceedings of IEEE International Conference on Robotics and Biomimetics (ROBIO'06), pages 1517-1522, Kunming, China, Dec. 17-20 2006.

C1. H. D. Taghirad, N. Abedi, **E. Noohi**, "A New Sensorless Vector Control Method for Permanent Magnet Synchronous Motors without Velocity Estimator". In Proceedings of 7th International Workshop on Advanced Motion Control(AMC'02), pages 242-247, Maribor, Slovenia, July 3-5 2002

Workshop Papers:

W4. **E. Noohi**, H. Moradi, S. Parastegari and M. Nili Ahmadabadi, "A Planar (2D) Wheeled-tip Robotic Hand: Dexterous Object Manipulation with Unlimited Rolling Contacts", Workshop on Robotic Hands, Grasping, and Manipulation @ IEEE International Conference on Robotics and Automation (ICRA'15), Seattle, Washington, USA, May 26th - 30th, 2015.

W3. **E. Noohi** and M. Žefran, "Human-Robot Cooperation Strategy based on the Interaction Model of a Human-Human Collaborative Object Manipulation", Workshop on Rehabilitation Robotics and Human-Robot Interaction @ IEEE International Conference on Robotics and Automation (ICRA'15), Seattle, Washington, USA, May 26th - 30th, 2015.

W2. **E. Noohi** and M. Žefran, "Biomechanical Predictive Model for Bimanual and Dyadic Object Manipulation: A Cooperation Strategy for Two Hands", Workshop on Haptics for Neuroscience and Neuroimaging @ IEEE International Conference on Robotics and Automation (ICRA'15), Seattle, Washington, USA, May 26th - 30th, 2015.

W1. **E. Noohi** and M. Žefran, "Modeling Human Arm Motion and the Internal Force during a Human-Human Dyadic Reaching Movement", Workshop on Human Movement Understanding and Neuromechanics @ IEEE International Conference on Robotics and Automation (ICRA'15), Seattle, Washington, USA, May 26th - 30th, 2015.

Posters:

P3. **E. Noohi**, B. Abbasi, S. Parastegari and M. Žefran, "Motion Primitives for Human Manipulation Actions and their Role in Multimodal Human-Robot Communication", (25th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), Columbia University, NY, USA, August 26-31, 2016.

P2. **E. Noohi** and M. Žefran, "A Control Policy for Human-Robot Cooperation based on Internal Force Model", IEEE International Conference on Robotics and Automation (ICRA'15), Seattle, Washington, USA, May 26th - 30th, 2015.

P1. **E. Noohi** and M. Žefran, "Human-Robot Cooperation Strategy based on the Interaction Model of a Human-Human Collaborative Object Manipulation", The 4th Midwest Workshop on Control and Game Theory (WCGT 2015), Iowa State University, April 26, 2015.

Doctoral Consortium:

D1. **E. Noohi**, "Kinematic analysis of Object Manipulation using Wheeled- tip Manipulators", IEEE International Conference on Networking, Sensing and Control (ICNSC 2010), Chicago, IL, USA, April 11 - 13, 2010.

Awards

ECE Department Nominee for Dean's Scholar Award, University of Illinois at Chicago	2016
Provost's Award for Graduate Research, University of Illinois at Chicago	2015
The Graduate Student Presenter Award, University of Illinois at Chicago	2015
The Graduate Student Council Travel Award, University of Illinois at Chicago	2015

"Energy Track" Award in "Memory Scheduling Championship (MSC)" 2012
In the 3rd JILP Workshop on Computer Architecture Competitions (JWAC-3)
University of Utah, Salt Lake City, Utah

Graded "A" for dissertation and all courses in previous PhD and therefore in GPA. 2010
University of Tehran, Tehran, Iran.

Ranked 1st of graduated Master students based on overall GPA. 2002
K.N.Toosi University of Technology, Tehran, Iran.

Ranked top 10% of graduated seniors of Electrical and Computer Engineering. 1999
University of Tehran, Tehran, Iran.

Ranked 17 among 400,000 applicants in B.Sc. National Universities Entrance Exam, Iran. 1995

Presentations

Invited Talks

Motor Learning & Biorobotics meetings at Rehabilitation Institute of Chicago (RIC) Dec. 2014

Conference Presentations

IEEE World Haptic Conference (WHC'15) June 2015

IEEE International Conference on Robotics and Automation (ICRA'15) May 2015

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'14) Sept. 2014

ASME/IEEE International Conference on Advanced Intelligent Mechatronics (AIM'09) July 2009

39th International Symposium on Robotics (ISR'08) Oct. 2008

International Workshop on Advanced Motion Control (AMC'02) July 2002

Poster Presentations

IEEE International Conference on Robotics and Automation (ICRA'15) May 2015

The 4th Midwest Workshop on Control and Game Theory (WCGT 2015) April 2015

Memberships

Golden Key International Honor Society Lifetime Member
IEEE Robotics and Automation Society Student Member
American Federation of Teachers (AFT) Higher Education Member

Professional Service

Journal Article Referee

IEEE Transactions on Automation Science and Engineering

Robotics and Autonomous Systems (Elsevier Journal)

Robotica (Cambridge Journals)

Conference Paper Referee

RSI International Conference on Robotics and Mechatronics (ICROM)	2015, 2016
IEEE Haptics Symposium (HAPTICS)	2015
IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO)	2015
IEEE World Haptics Conference (WHC)	2015
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2014
IEEE Conference on Decision and Control (CDC)	2014, 2015
American Control Conference (ACC)	2012, 2014

Graduate Employee's Organization (GEO) Steward

ECE representative in GEO at the University of Illinois at Chicago	2011-2013

Student Volunteer

The American Control Conference (ACC)	July 2015

Work Experience

Visiting Researcher, Robotics Lab, Rehabilitation Institute of Chicago (RIC)	2015 – present
Research Assistant, Robotics Lab, University of Illinois at Chicago (UIC)	2011 – present
Summer Intern, System Analyst, Intuitive Surgical Inc., Sunnyvale, CA	Summer 2016

Mentor for Undergraduate Students

Joshua Shubert — Design and development of a data glove	Fall 2015
Zeus-Deo Ceniza — Implementation of an autonomous mobile robot in ROS	Summer 2014

Adjunct Lecturer

Computer Organization II (ECE366) Electrical and Computer Engineering Dept., University of Illinois at Chicago	Spring 2015
Discrete and Continuous Signals and Systems (ECE310) Electrical and Computer Engineering Dept., University of Illinois at Chicago	Summer 2014
Computer Organization II (ECE366) Electrical and Computer Engineering Dept., University of Illinois at Chicago	Fall 2013

Teaching Assistant

Electrical and Computer Engineering Dept., University of Illinois at Chicago	2011 – present