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Updated: October 2009

EDUCATION

Ph. D. in Mechanical Engineering

Johns Hopkins University, August 2007

Thesis Topic: Motion control methods for human-machine cooperative systems

Advisor: Dr. Allison M. Okamura

M.S. in Mechanical Engineering

Johns Hopkins University, May 2004

Specialization: Robotics

Advisor: Dr. Allison M. Okamura

B.S. in Mechanical Engineering

Florida Institute of Technology, May 2001

With Highest Honors

POSITION HELDS

Assistant Professor – 2007 – present

Department of Mechanical and Aerospace Engineering
California State University at Long Beach

Graduate Research Assistant – 2001- 2007

Haptic Exploration Laboratory and Engineering Research Center for Computer-Integrated Systems
and Technology (ERC-CISST)
Johns Hopkins University

Undergraduate Research Assistant – Summer 2000

Robotics and Spatial System Laboratory (Directed by Dr. Pierre M. Larochelle)
Florida Institute of Technology

PUBLICATIONS

Journal Articles

1. P. Marayong and A. Okamura, "Integration of Hand Dynamics in Virtual Control of Human-machine Cooperative Systems," IEEE Transactions on Robotics, 2009. *In preparation*
2. D. Kragic, P. Marayong, M. Li, A. M. Okamura, and G. D. Hager, "Human Machine Collaborative Systems for Microsurgical Applications," International Journal of Robotics Research, Vol. 24, No. 9, pp. 731-742, 2005.
3. P. Marayong and A. M. Okamura, "Speed-Accuracy Characteristics of Human-Machine Cooperative Manipulation Using Virtual Fixtures with Variable Admittance," Human Factors, Vol. 46, No. 3, pp. 518-532, 2004.

4. O. Gerovich, P. Marayong, and A. M. Okamura, "The Effect of Visual and Haptic Feedback on Computer-Assisted Needle Insertion," *Computer-Aided Surgery*, Vol. 9, No. 6, pp. 243-249, 2004.
5. A. Bettini, P. Marayong, S. Lang, A. M. Okamura, and G. D. Hager, "Vision Assisted Control for Manipulation Using Virtual Fixtures," *IEEE Transactions on Robotics*, Vol. 20, No. 6, pp. 953-966, 2004.

Refereed Conference Proceedings

1. M. Payombar and P. Marayong, "Automatic Vibrotactile Device for Apnea Interruption: Design and Evaluation", *IEEE Engineering in Medicine and Biology Conference*, 2010. *In preparation*
2. F. Vera, M. Payombar, and P. Marayong, "Vibrotactile Device with Fully-integrated User Control Unit for Apnea of Prematurity", *ASME Frontiers in Biomedical Devices Conference*, 2010. *In preparation*
3. P. Marayong and M. S. Mostoufi, "Foot Vibrotactile Device for Central Apnea Interruption in Premature Infants", *Medicine Meets Virtual Reality (MMVR)*, vol. 142, pp. 180-182, 2009.
4. P. Marayong, G.D. Hager and A. M. Okamura, "Control Methods for Guidance Virtual Fixtures in Compliant Human-Machine Interfaces", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1166-1172, 2008.
5. P. Marayong, H. S. Na, and A. M. Okamura, "Virtual Fixture Control for Compliant Human-Machine Interfaces," *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 4018-4024, 2007.
6. P. Marayong, G. D. Hager, and A. M. Okamura, "Effect of Hand Dynamics on Virtual Fixtures for Compliant Human-Machine Interfaces," *14th Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, pp. 109-115, 2006.
7. H. Lin, P. Marayong, K. Mills, R. Karam, P. Kazanzides, A. M. Okamura, and G. D. Hager, "Portability and Applicability of Virtual Fixtures Across Medical and Manufacturing Tasks," *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 225-230, 2006.
8. H. Lin, M. Dewan, P. Marayong, J. Handa, and G. D. Hager, "Vision-Based Human-Machine Collaborative System for Ophthalmic Micro-Surgery," *Medicine Meets Virtual Reality*, 2006.
9. M. Dewan, P. Marayong, A. M. Okamura, and G. D. Hager, "Vision-Based Assistance for Ophthalmic Microsurgery," *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Vol. 2, pp. 49-57, 2004.
10. I. Emeagwali, P. Marayong, J. J. Abbott, and A. M. Okamura, "Performance Analysis of Steady-Hand Telemanipulation versus Cooperative Manipulation," *12th Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, pp. 316-322, 2004.
11. P. Marayong, M. Li, A. M. Okamura, and G. D. Hager, "Spatial Motion Constraints: Theory and Demonstrations for Robot Guidance using Virtual Fixtures," *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1954-1959, 2003.
12. D. Kragic, P. Marayong, M. Li, A.M. Okamura, and G.D. Hager, "Human-Machine Collaborative Systems for Microsurgical Applications," *International Symposium on Robotics Research*, October 2003.
13. P. Marayong, A. Bettini, and A.M. Okamura, "Effect of Virtual Fixture Compliance on Human-Machine Cooperative Manipulation," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1089-1095, 2002.
14. O. Gerovich, P. Marayong, and A. M. Okamura, "The Effect of Visual and Haptic Feedback on Manual and Teleoperated Needle Insertion," *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, *Lecture Notes in Computer Science (Vol. 2488)*, T. Dohi and R. Kikinis, Eds., pp. 147-154, 2002.

Book Chapter

J. J. Abbott, P. Marayong, and A. M. Okamura, "Haptic Virtual Fixtures for Robot-Assisted Manipulation," Springer Tracts in Advanced Robotics, Vol 28, pp. 49-64, 2007. (Based on the work published in the 12th International Symposium of Robotics Research, 2005)

TEACHING**Graduate Students:**

Wesley Holleman (M.S., Fall 2009-Fall 2010), Project topic: Gait analysis of bilateral below-knee amputees.

Fernando Vera (B.S., Student Summer Stipend Award, 2009), Topic: Integrated control board for an automated device for treatment of apnea.

Martin Guirguis (B.S., Student Summer Stipend Award, 2009), Topic: Haptic learning module for instruction enhancement.

Mojgan Payombar (M.S., Fall 2008-Spring 2009), Project topic: Design and analysis of vibrotactile device for apnea interruption.

Mehrdad S. Mostoufi (M.S., Fall 2007-Spring 2008), Project topic: Vibration feedback device for treatment of apnea in premature babies.

Courses Taught:**Computer Methods for MAE (MAE 205)**

Every semester since Fall 2008

California State University, Long Beach

Course description: The course introduces students to the application of computer programming (MATLAB) as a tool to solve engineering problems and input-output concepts for both numerical and graphical results. The course highly focuses on lab-based exercises that integrate basic math and engineering principles and the use of the software to solve real world engineering problems.

Analysis and Design of Machine Components (MAE 471)

Every semester since Fall 2007

California State University, Long Beach

Course description: The senior-level course includes lectures, assignments, and a group project. The course focuses on the application of the principles of mechanics and physical properties of materials to the proportioning of machine elements, including consideration of function, safety, production, and economic factors.

Introduction to Mechanical Engineering (MAE 101B)

Fall 2007, Spring 2008, Spring 2009, Fall 2009

California State University, Long Beach

Course description: The course introduces students to various aspects of the mechanical engineering profession including different disciplines of mechanical engineering, their impact on the society, and the skills that help prepare them to succeed in college and in a professional career. The covered topics include engineering fundamentals, engineering design and problem solving skills. Students participate in a group project to design and build a simple mechanical device for various assigned themes such as a household device using recycled materials.

Introduction to Engineering Profession (ENGR 101)

Every Fall since Fall 2007

California State University, Long Beach

Course description: The freshman-level course is aimed to introduce the incoming students to the Engineering programs available at CSULB and to assist students in recognizing the wide diversity of opportunities in engineering. The course includes lectures and guest presentations from engineers from various disciplines. Students also learn basic writing and presentation skills for technical communication through individual and team papers.

Haptics and Applications in Medicine

Winter Intersession 2007

Johns Hopkins University

Co-Instructor for a three-week undergraduate-level introductory course in haptics. Developed course materials, which included lectures, laboratory that involved programming a haptic device for virtual reality, conducting research discussions, and evaluating students' performance. The class earned "excellent" rating for the overall class quality in the 2006-2007 academic course evaluation.

Haptics and Computer-Integrated Surgical Technology

August 8-18, 2006 and September 5-9, 2005

Department of Mechanical Engineering and Biomedical Engineering

Mahidol University, Thailand

Invited visiting instructor for graduate-level course in Computer-Integrated Surgery. Designed and developed the course materials, which included lectures, a programming assignment, and a final design project. The responsibilities included grading and advising students on the design project. (Lectured in English)

INVITED PRESENTATIONS

Technical

1. *Foot Vibrotactile Device for Central Apnea Interruption in Premature Infants*, poster presentation at the 17th Medicine Meets Virtual Reality Conference in Long Beach, CA. January 20, 2009.
2. *Control Methods for Guidance Virtual Fixtures in Compliant Human-Machine Interfaces*, IEEE International Conference on Robotics and Automation in Nice, France. September 24, 2008.
3. *Effect of Hand Dynamics on Virtual Fixtures for Compliant Human-Machine Interfaces*, 14th Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems, Washington D.C., USA. March 25, 2006.
4. *Haptics and its Applications to Computer-Integrated Surgery*, School of Engineering Open House, Mahidol University, Nakorn Pathom, Thailand. September 7, 2005.
5. *Spatial Motion Constraints: Theory and Demonstrations for Robot Guidance using Virtual Fixtures*, ICRA, Taipei, Taiwan. September 15, 2003.
6. *Virtual Fixture Implementation*, King Mongkut's University of Technology, Thonburi, Thailand. June 6, 2003
7. *Effect of Virtual Fixtures on Human-Machine Cooperative Systems*, IROS, Lausanne, Switzerland. October 2, 2002.

Non-technical

1. *Human-machine Collaborative Systems*, Presentation at the CSULB Society of Women Engineers general meeting, March 16, 2009.
2. *Robotics*, Session on robotics for middle school girls, Women at the Beach, California State University at Long Beach, November 9, 2007.
3. *Get a Grip!*, Session on haptics for middle school girls, Computer Mania Day, University of Maryland in Baltimore County, May 6, 2006. (Co-presented)

4. *Get a Grip!*, Session on haptics for middle school girls, Computer Mania Day, University of Maryland in Baltimore County, April 9, 2005. (Co-presented)

HONORS AND AWARDS

2009	Provost's Student Summer Stipend Awards
2009	SCAC Summer Stipend, CSULB
2008-2009	49er Shop Allocation for Women Engineers @ the Beach Day
2008	SCAC Summer Stipend, CSULB
2008	3ET Award for Interactive Mechanical System Platform, CSULB
2008	IRA Award for Robotics for MAE 101B
2001-2002	Abel Wolman Fellowship, Johns Hopkins University
1997-2001	Faculty Merit Scholarship Recipient, F.I.T.
2000	ASEAN Scholarship Recipient
2000	Outstanding Junior, Department of Mechanical Engineering, F.I.T.
1999	Distinguished Student Scholar Recipient, F.I.T.

PROFESSIONAL ACTIVITIES

Service

- University Honors Program Committee
California State University, Long Beach
Spring 2008 - present
- IEEE Engineering in Medicine and Biology Society (IEEE-EMB)
LAC Region Treasurer
Fall 2009 – present
- Society of Women Engineers (SWE)
Faculty Advisor, CSULB
Spring 2008 – present
- College of Engineering Scholarship Committee
Fall 2008- present
- College of Engineering Scholarship Committee (MAE Representative)
Fall 2008- present
- College of Engineering Grade Appeals Committee
Fall 2008 – Spring 2009
- College of Engineering Undergraduate Curriculum Review Task Force
Summer 2009 – present
- MAE Department Undergraduate Curriculum Committee
Fall 2007 – present
- MAE Department Faculty Hearing Panel
Fall 2009 - present

Memberships

American Society of Mechanical Engineers (ASME)
Institute of Electrical and Electronics Engineers (IEEE)
IEEE Robotics and Automation Society (RAS)
Society of Women Engineers (SWE)
Tau Beta Pi

Pi Tau Sigma
Phi Eta Sigma

Technical Reviews

ASME Journal of Dynamic Systems, Measurement and Control
ASME Journal of Mechanical Design
IEEE International Conference on Robotics and Automation (ICRA)
IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)
IEEE International Conferences on Robotics, Automation & Mechatronics (RAM)
Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems
Euro Haptics Conference
World Haptics Conference
Robotica

Passed Fundamentals of Engineering Exam (FE/EIT), 2000

LANGUAGE SKILLS: Fluent English and fluent Thai