Panadda (Nim) Marayong, Ph.D.

Curriculum Vitae

Mechanical and Aerospace Engineering Department
California State University, Long Beach
1250 Bellflower Blvd. / ECS 642
Long Beach, CA 90840

Phone: 562 985 4283
Fax: 562 985 4408
Email: marayong@csulb.edu
Web: http://www.csulb.edu/~marayong

EDUCATION

Ph. D. in Mechanical Engineering
Johns Hopkins University, August 2007 (Degree conferred in May 2008)
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
Advisor: Dr. Allison M. Okamura

B.S. in Mechanical Engineering
Florida Institute of Technology, May 2001
With Highest Honors

POSITION HELD

Assistant Professor – 2007 – present
Department of Mechanical and Aerospace Engineering
California State University at Long Beach

Treasurer – May 2010 – present
IEEE Engineering in Medicine and Biology Chapter
Coastal Los Angeles Section

Faculty Advisor – 2008 – present
Society of Women Engineers
California State University, 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. M. Payombar, F. Vera, and P. Marayong, “Automatic Vibrotactile Device for Interruption of Apnea in Premature Infants”, Abstract appears in ASME Journal of Medical Devices, Vol. 4, No. 2, 2010.
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. R. C. Rorie, H. Bertolotti, T. Strybel, K. Vu, P. Marayong, and J Robles, “Effect of force feedback on an aimed movement task”, Symposium on Evaluation of Potential NextGen Interfaces and Training Issues, 4th Applied Human Factors and Ergonomics Conference (AHFE), 2012. *Accepted for Publication*
2. J. Robles, M. Sguerri, C. Rorie, K. Vu, T. Strybel, and P. Marayong, “Integration Framework for NASA NextGen Volumetric Cockpit Situation Display with Haptic Feedback”, IEEE International Conference on Robotics and Automation (ICRA), 2012. *Accepted for Publication*
3. W. Holleman, S. D’Avella, B. Ruhe, D. Craig, and P. Marayong, “Gait analysis of bilateral transtibial amputees”, CSU Biotechnology Symposium, 2012.
4. H. Yeh, P. Marayong, E. Coronado, V. Ganji, and A. Chaudhari, “A preliminary experimental study of the testbed for ergonomic port crane operation”, METRANS National Urban Freight Conference, 2011.
5. P. Marayong, H. Yeh, E. Coronado and Y. Bittar, “Preliminary Development of an Assistive User Interface for Ergonomic Port Crane Operation”, Abstract accepted and paper submitted to the 52nd Annual Transportation Research Forum, 2011.
6. 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.
7. 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.
8. 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.
9. 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.

10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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 the12th International Symposium of Robotics Research, 2005)

SELECTED PROJECTS/PROPOSALS

- "STEP At the Beach", Senior Investigator
  Funding source: NSF Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) Type I, *Submitted*
- "Feasibility Study of Computer-aided Assistance for Ergonomic Crane Operation", PI
  Funding source: METRANS Transportation Center ($35,000 awarded for October 2010-2011)
- "Gait analysis of bilateral below-knee amputee", Principal Investigator
  Collaborator: The Veterans Affairs Medical Center, Long Beach
  Funding source: CSU Program for Education and Research in Biotechnology ($15,000 awarded for July 2010 – December 2011)
- "Modeling and control of educational haptic robot using MATLAB and Simulink", co-investigator.
  Collaborator: Dr. Robert Webster, Vanderbilt University (PI)
  Funding source: Mathworks
- "Design of User Input Device for NASA NextGen Cockpit Situation Display", Researcher
  Collaborator: Center for Human Factors in Advanced Aeronautics and Technologies (PIs: Drs. Thomas Strybel and Kim Vu)
  Funding source: NASA-University Research Center Program
- "Robotic platform for sealant application", Co-PI (Completed)
  Collaborator: Center for Advanced Technology Support for Aerospace Industry (CATSAI)
  Funding source: The Boeing Company

ADVISING

Graduate Students

- Jose Robles (M.S. in Computer Engineering, Summer 2010-Spring 2012)
  Thesis topic: Integration of force feedback in NASA NextGen Cockpit Situation Display
  Supported by NASA URC-CHAAT
  Co-advised with Dr. Min He (CECS), Drs. Kim-Phuong Vu and Thomas Strybel (Psychology)
- Luis Calderon (M.S. in Computer Engineering, Summer 2010-Spring 2012)
  Project topic: Design of a new user input device for NASA NextGen Cockpit Situation Display
  Supported by NASA URC-CHAAT
  Co-advised with Drs. Kim-Phuong Vu and Thomas Strybel (Psychology)
- Vinay Ganji (M.S. in Electrical Engineering, Spring 2011-Spring 2012)
  Thesis topic: Motion guidance with visual and haptic display for port crane operation
  Co-advised with Dr. Henry Yeh (EE)
- Fernando Vera (M.S. in Electrical Engineering, AY 2011-2012)
  Project topic: Design of a 2D haptic display for console application
  Co-advised with Dr. Fumio Hamano (EE)
- Bhoomi Gadhia (M.S. in Mechanical Engineering, Fall 2010-Fall 2011)
  Project topic: Education haptic robot using MATLAB and Simulink
  Supported by funding from Mathworks
- Edgar Coronado (M.S. in Mechanical Engineering, Fall 2010-Spring 2011)
  Thesis topic: Feasibility study of haptic feedback in assisting port crane operation
  Supported by funding from METRANS
- Wesley Holleman (M.S. in Mechanical Engineering, Fall 2009-Spring 2011)
  Project topic: Gait analysis of bilateral below-knee amputees
  Supported by funding from CSUPERB
- Mojgan Payombar (M.S. with thesis, Fall 2008-Spring 2009)
  Thesis title: Automatic Vibrotactile Device for Apnea Interruption.
- Mehrdad S. Mostoufi (M.S. Project., Fall 2007-Spring 2008)
  Topic: Closed-loop Vibration Feedback Device for Treatment of Apnea in Premature Infants.

Undergraduate Students

- Punravee Cherngchaosil (B.S. in Computer Science, Fall 2011-Spring 2012)
  Project topic: Software integration of NASA NextGen Cockpit Situation Display
  Supported by NASA URC-CHAAT
- Sarah D'Avella (B.S. in Mechanical Engineering, Summer 2011-Fall 2011)
  Project topic: Gait data analysis of bilateral below-knee amputees
  Supported by funding from CSUPERB
- Matthew Sguerri (B.S. in Computer Science, Spring-Summer 2011)
  Project topic: Software integration of NASA NextGen Cockpit Situation Display
  Supported by NASA URC-CHAAT
- 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.

COURSES

Haptic Systems for Virtual Reality and Teleoperation (MAE 578)
Even spring semester since Spring 2010
California State University, Long Beach
Course description: This graduate-level course offers an introduction to haptic systems which involve virtual and teleoperated environments that are displayed through force and/or tactile feedback. Topics covered include human haptic sensing and control, design of haptic interfaces, haptics for teleoperation, haptic rendering and modeling of virtual environments, control and stability issues, and applications such as surgical simulation and teleoperated robots.

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.

Kinematics and Dynamics of Mechanisms (MAE 375)
Every semester starting Fall 2011
Course description: The junior-level course introduces student to the fundamentals of motion and force analysis in common mechanisms including planar linkages, gears, and cams. The topics include graphical and analytical synthesis and analysis methods to study the kinematics (position, velocity, and acceleration) and dynamics of simple mechanisms and their design. The course was updated to include interactive labs with hands-on team-based activities and analytical problem solving with MATLAB/Simulink for the analysis and visualization of the mechanisms. The course is a critical prerequisite course for the mechanical engineering senior design capstone courses (MAE 471/472).

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.

Introduction to Mechanical Engineering (MAE 101B)
Fall 2007, Fall 2009, Every Spring since 2008
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 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 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. "*A preliminary experimental study of the testbed for ergonomic port crane operation*", Oral presentation at the METRANS National Urban Freight Conference, Long Beach, CA. October 12-14, 2011.
2. "*Preliminary development of an assistive user interface for ergonomic port crane operation*", Oral presentation at the Annual Transportation Research, Long Beach, CA. March 11-12, 2011.
3. *Linking Human Factors to Robot Design*, a keynote speaker at the 5th Annual Regional Human Factors, CSULB, February 27, 2010.
4. *Automatic Vibrotactile Device for Interruption of Apnea in Premature Infants*, poster presentation at the ASME Design of Medical Devices Conference at the University of Minnesota, April 13, 2010.
5. *Linking Human Factors to Robot Design*, Invited keynote presentation at the Regional Human Factors and Ergonomics Society, California State University, Long Beach, February 28, 2010.
6. *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.
7. *Control Methods for Guidance Virtual Fixtures in Compliant Human-Machine Interfaces*, IEEE International Conference on Robotics and Automation in Nice, France. September 24, 2008.
8. *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.
9. *Haptics and its Applications to Computer-Integrated Surgery*, School of Engineering Open House, Mahidol University, Nakorn Pathom, Thailand. September 7, 2005.
10. *Spatial Motion Constraints: Theory and Demonstrations for Robot Guidance using Virtual Fixtures*, ICRA, Taipei, Taiwan. September 15, 2003.
11. *Virtual Fixture Implementation*, King Mongkut's University of Technology, Thonburi, Thailand. June 6, 2003
12. *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 Curriculum and Educational Policies Council (Secretary)
  California State University, Long Beach
  Fall 2010 – present
- University Honors Program Committee
  College of Engineering Representative
  Spring 2008 – Spring 2011
- College of Engineering Scholarship Committee
  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 TT Search in Astronautics Committee
  Fall 2010-Spring 2011
- 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 EIT Exam