

MONEER MOHAMMAD HELU

M.S./Ph.D. Student
Laboratory for Manufacturing and Sustainability
University of California, Berkeley

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EDUCATION

Ph.D. Mechanical Engineering, University of California, Berkeley, May 2013 (Expected)
M.S. Mechanical Engineering, University of California, Berkeley, December 2009
S.B. Mechanical Engineering, Massachusetts Institute of Technology, June 2007

RESEARCH INTERESTS

Environmental Sustainable Manufacturing, Interoperability, Machining, Precision Manufacturing, Process Control and Monitoring, Sensors.

PROFESSIONAL EXPERIENCE

8/07 – Present *Graduate Student Researcher*

Laboratory for Manufacturing and Sustainability, UC Berkeley

Investigate the relationship between environmental impact and precision of machining processes. Led environmental, performance, and financial impact assessments of machine tools. Assisted in the development of environmental assessment standards for US Air Force manufacturing contractors. Conducted research on sensor integration, process monitoring, and interoperability for machine tools and precision planarization processes. Studied roller imprinting technologies for micro-fluidic device fabrication.

6/07 – 7/07 *Manufacturing Engineering Intern*

Body-In-White B.O.E. 4.0, General Motors Corporation

Coordinated development of manual nut welder tooling with supplier. Developed tests to prove weld tool process and safety. Supervised installation, integration, and operator training for hood hinge, door hinge, door load, fender load, and hood load tooling for Pontiac G6 and Chevrolet Malibu. Led re-design and validation of air logic systems.

8/06 – 6/07, *Undergraduate Research Assistant*

6/05 – 5/06 Experimental and Nonlinear Dynamics Laboratory, MIT

Investigated new theoretical criterion of unsteady flow separation. Developed new and evaluated current flow visualization techniques. Designed dye injection system for experimental apparatus. Improved data collection by programming analysis tools. Expanded the use of laser and tagging technologies in flow analysis. Programmed motor controller for quasi-periodic and random motion movements.

5/06 – 8/06 *Manufacturing Engineering Intern*

General Motors Corporation, Body-In-White Execution

Supervised installation and integration of roof load tooling for Chevrolet Malibu and Saturn Aura. Directed robot programming for new and existing roof load cells. Assisted

in the design and implementation of sensor package to detect double roofs. Responsible for continual improvement of roof load manufacturing processes.

6/04 – 8/04 *Undergraduate Research Assistant*
Nayfeh Laboratory, Laboratory for Manufacturing and Productivity, MIT
Assisted in design and manufacture of bias-weaving machine. Designed expanded creel and uptake sensors. Built various components. Programmed several weaving functions. Contributed towards design of several weaves.

TEACHING EXPERIENCE

Fall 2010 *Graduate Student Instructor*
University of California, Berkeley Course ME 220 (Precision Manufacturing)
Communicated concepts in precision design and manufacturing to 20 mechanical engineering graduate students. Guest lecturer for 4 lectures on thermal errors, error budgets, and precision machining processes. Guided students through laboratory assignments. Mentored students through term project. Conducted weekly office hours and exam review sessions. Assisted with grading.

Spring 2006, *Undergraduate Assistant*
Spring 2007 MIT Course 2.007 (Design and Manufacturing I)
Communicated concepts in design and manufacturing to 10 sophomore and junior mechanical engineering majors. Guided students through term-long design-and-build project. Developed students creative abilities, self-confidence, and ability to remain on schedule and under budget. 3 students finished 2006 culminating contest in top 10 of 120.

Spring 2005 *Undergraduate Assistant*
MIT Course 2.003 (Modeling Dynamics and Control I)
Communicated concepts in systems and control theory to 24 sophomore, junior, and senior mechanical engineering majors. Aided in laboratory setups. Assisted students with laboratory exercises.

AWARDS AND HONORS

2011 Anselmo John Macchi Fellowship, University of California, Berkeley
2010 Block Grant Award, University of California, Berkeley
2009 CIRP-NSF Fellowship for the 59th CIRP General Assembly
2008-2009 John G. Maurer Fellowship, University of California, Berkeley
2007 National Science Foundation Fellowship Honorable Mention
2007 MIT Department of Mechanical Engineering Wunsch Foundation Silent Hoist and Crane Award for Outstanding Service

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

American Society of Mechanical Engineers
Pi Tau Sigma Mechanical Engineering Honor Society
Sigma Xi Scientific Research Society
Tau Beta Pi National Engineering Honor Society

TECHNICAL SKILLS

CAE: MATLAB, MathCAD, Mathematica
CAD/CAM: SolidWorks, MasterCAM, Esprit, G-Code

LANGUAGES

Arabic: Good (reading, writing), Fair (comprehension, speaking)

UNIVERSITY SERVICE

- 11/09 – Committee Member
Present External Affairs Graduate Assembly Committee, Associated Students of the University of California
- 10/09 – Delegate
Present Graduate Assembly, Associated Students of the University of California
- 2/09 – 6/10 Campus Representative – Berkeley
University of California System-wide Graduate Student Health Insurance Policy Committee
- 6/06 – 5/07 Treasurer
Pi Kappa Chapter, MIT Pi Tau Sigma Mechanical Engineering Honor Society
- 6/06 – 5/07 Chairman
MIT Pi Tau Sigma Career Fair
- 6/05 – 5/06 Associate Advisor
MIT Office of Undergraduate Advising and Academic Programming

PUBLICATIONS

Archival Journal Publications

1. Weldon, M., Peacock, T., Jacobs, G., Helu, M., Haller, G., “Experimental and numerical investigation of the kinematic theory of unsteady separation,” *J. Fluid Mechanics*, 611, pp. 1-11, 2008.
2. Dornfeld, D., Wright, P. K., Vijayaraghavan, A., Helu, M., “Enabling manufacturing research through interoperability,” *Trans. 37th North American Research Institute*, 37, pp. 443-450, 2009.
3. Lee, D. E., Choi, J., Hwang, I., Kim, H. J., Chien, J., Helu, M., Dornfeld, D. A., “Process monitoring of CMP with acoustic emission,” submitted to *IEEE Trans. Semiconductor Manufacturing*, 2010.
4. Helu, M., Vijayaraghavan, A., Dornfeld, D., “Evaluating the relationship between use-phase environmental impacts and manufacturing process precision,” submitted to *Annals of the CIRP*, 2011.

Refereed Conference Proceedings

1. Vijayaraghavan, A., Jayanathan, S. V., Helu, M. M., and Dornfeld, D. A., “Design and fabrication of a roller imprinting device for microfluidic device manufacturing,” *Proc. ASME International Manufacturing Science and Engineering Conference*, Monterrey, Mexico, October 2008, pp. 551-560.
2. Niggeschmidt, S., Helu, M., Diaz, N., Behmann, B., Lanza, G., Dornfeld, D. A., “Integrating green and sustainability aspects into Life Cycle Performance evaluation,” *Proc. 17th CIRP International Conference on Life Cycle Engineering*, Hefei, China, May 2010, pp. 366-371.
3. Diaz, N., Helu, M., Jayanathan, S., Chen, Y., Horvath, A., Dornfeld, D., “Environmental analysis of milling machine tool use in various manufacturing environments,” *Proc. 2010 IEEE International Symposium on Sustainable Systems and Technology*, Arlington, VA, May 2010.

4. Diaz, N., Choi, S., Helu, M., Chen, Y., Jayanathan, S., Kong, D., Yasui, Y., Payanaskar, S., Dornfeld, D., "Machine tool design and operation strategies for green manufacturing," *Proc. 4th CIRP International Conference on High Performance Cutting*, Gifu, Japan, October 2010, pp. 271-276.
5. Helu, M., Rühl, J., Werner, P., Dornfeld, D., Lanza, G., "Evaluating trade-offs between sustainability, performance, and cost of green machining technologies," to appear *18th CIRP International Conference on Life Cycle Engineering*, Braunschweig, Germany, May 2011.

Non-Refereed Publications

1. Diaz, N., Helu, M., Jarvis, A., Tönissen, S., Dornfeld, D., Schlosser, R., "Strategies for minimum energy operation for precision machining," *Proc. Machine Tool Technology Research Foundation Annual Meeting*, Shanghai, China, July 2009, pp. 47-50.
2. Diaz, N., Helu, M., Dornfeld, D., "Design and operation strategies for green machine tool development," *Proc. Machine Tool Technology Research Foundation Annual Meeting*, San Francisco, CA, July 2010, pp. 77-82.

Textbooks

1. Helu, M., "Principles of green manufacturing," chapter in *Green Manufacturing: Fundamentals and Applications*, edited by D. Dornfeld, in progress.
2. Helu, M., Vijayaraghavan, A., "Enabling technologies for green manufacturing," chapter in *Green Manufacturing: Fundamentals and Applications*, edited by D. Dornfeld, in progress.

Theses

1. Helu, M., *Investigation into Unsteady Separation in a Quasi-Periodic, Two-Dimensional Flow*, S.B. Thesis, Massachusetts Institute of Technology, June 2007.
2. Helu, M., *Sensor Systems and Interoperability for Precision Planarization*, M.S. Project, University of California, Berkeley, December 2009.

Invited Talks

1. Chien, J., Helu, M., Dornfeld, D., Lee, D. E., "CMP process monitoring and system interoperability using acoustic emission," Keynote Presentation, *SEMICON West*, San Francisco, July 2009.