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Kamal Youcef-Toumi

Professor of Mechanical Engineering

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Catherine Hogan
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Education:

ScD. in Mechanical Engineering, June 1985
Massachusetts Institute of Technology
S.M. in Mechanical Engineering, June 1981
Massachusetts Institute of Technology
B.S. in Mechanical Engineering, June 1979
University of Cincinnati

MIT Service: 22 years

Research Associate and Lecturer June 1985 Dec. 1985
Assistant Professor Jan. 1986 June 1989
Associate Professor (without tenure) July 1989 June 1992
Associate Professor (with tenure) July 1992 June 1998
Professor (with tenure) July 1998 present

Other Related Experience (selections from past 10 years):

Proctor & Gamble Co., Faculty Liaison (Engineering Internship Program) - Oct. 1991 Oct. 1996
Chairman of Undergraduate Curriculum Committee (Dept.) - Sept. 1998 Sept. 1999
Schlumberger Co., Faculty Liaison (Engineering Internship Program) - June 1998 - May 30, 2005
Lawrence Livermore National Laboratory, Faculty Liaison (Engineering Internship Program) - July 2000 - May 30, 2005
Mechanical Engineering Department Research Council - Member - Sept. 2005

Consulting & Patents, etc (past 5 years):

The Gillette Company, Boston, Ma - Dec. 2000 - June 2001
Delta Search Labs, Cambridge, Ma, Advisory Board & Consultant - Sept. 2001 - Present
The Law Firm of George J. Cannata , expert witness - Nov. 2005 - Present

1. "Spectroscopic Systems and Methods", Saptari; Vidi A., Youcef-Toumi; Kamal (Cambridge, MA) United States Patent 7,099,003; August 29, 2006.
2. "Applicator" Shah; Manzoor A., Alvarado; Pablo Valdivia Y, Youcef-Toumi; Kamal, United States Patent 7,055,528; June 6, 2006.
3. "Height Calibration of Scanning Probe Microscope Actuators", El Rifai; Osamah M, Youcef-Toumi; Kamal, United States Patent 7,041,963; May 9, 2006.
4. "Color Image Segmentation in an Object Recognition System", Prempraneerach; Pradya, Youcef-Toumi; Kamal, United States Patent 7,020,329; March 28, 2006.
5. "Image Deconvolution Techniques for Probe Scanning Apparatus", Aumond; Bernardo D., Youcef-Toumi; Kamal, United States Patent 6,661,004; December 9, 2003.
6. "Atomic Force Microscope for Profiling High Aspect Ratio Samples", Aumond; Bernardo D., Youcef-Toumi; Kamal, United States Patent 6,489,611; December 3, 2002.

Principal Publications in last two years:

1. P. Valdivia y Alvarado and K. Youcef-Toumi "Design of Machines with Compliant Bodies for Biomimetic Locomotion in Liquid Environments", Journal of Dynamic Systems, Measurement, and Control - March 2006 Volume 128, Issue 1, pp. 3-13.
3. P. Valdivia y Alvarado, and K. Youcef-Toumi, "Performance of machines with flexible bodies designed for biomimetic locomotion in liquid environments", Proc. IEEE International Conference on Robotics and automation (ICRA), Barcelona, Spain 2005.
4. El Rifai, O. M. and K. Youcef-Toumi., "Trade-offs and Performance Limitations in Mechatronic Systems: A Case Study", Annual Reviews in Control, 2, 2004.
5. El Rifai, K., El Rifai, O., and K. Youcef-Toumi., "On Robust Adaptive Switched Control", American Control Conference 2005, Portland, OR.
6. El Rifai, K., and K. Youcef-Toumi., "Robust Adaptive Scheduled Switched Control", Conference on Decision and Control 2005, Seville, Spain
7. Shilpiekandula V, Youcef-Toumi K. "Modeling and Control of a Programmable Filter for Separation of Biologically Active Molecules", American Control Conference, 8-10 Jun 2005, pp 394 - 399.
8. El Rifai OM, Youcef-Toumi K, "Adaptive Control of Uncertain Dynamics at the Nano-scale", 44th IEEE Conference on Decision and Control, 2005 and 2005 European Control Conference. CDC-ECC 2005. 12-15 Dec. 2005, pp 1180 - 1184.
9. El Rifai K, El Rifai OM, Youcef-Toumi K. "Modeling and Control of AFM-based Nano-Manipulation Systems", In Proceedings of the 2005 IEEE International Conference on Robotics and Automation, 18-22 April 2005, pp 157 - 162., Barcelona, Spain.
10. El Rifai, O. M. and K. Youcef-Toumi., "Trade-offs and Performance Limitations in Mechatronic Systems: A Case Study", Annual Reviews in Control, 2, 2004.
11. El Rifai, O. M. and K. Youcef-Toumi. "On Automating Atomic Force Microscopes: An Adaptive Control Approach", Control Engineering Practice, to appear, 2006.
12. El Rifai K, El Rifai OM, Youcef-Toumi K. "Modeling and Control of AFM-

based Nano-manipulation

Systems", In Proceedings of the 2005 IEEE International Conference on Robotics and Automation, 18-

22 April 2005, pp 157 - 162., Barcelona, Spain.

13. D. J. Burns and K. Youcef-Toumi. "On single-molecule dna sequencing with functionalized carbon

nanotube probes", In 4th IFAC-Symposium on Mechatronic Systems, 2006.

14. D. J. Burns and K. Youcef-Toumi "Shortening carbon nanotube-tipped AFM probes", In 4th

International Symposium on Nanomanufacturing, 2006.

16. El Rifai Osamah, and Youcef-Toumi, Kamal, "Adaptive Control of Atomic Force Microscopes", 3rd

IFAC Symposium on Mechatronic Systems, Sydney, Australia, September 6-8, 2004.

17. El Rifai Khalid, El Rifai Osamah, and Youcef-Toumi, Kamal, "On Dual Actuation in of Atomic Force

Microscopes", American Control Conference, Boston, Massachusetts, USA, June 30- July 2, 2004.

19. El Rifai Osamah, and Youcef-Toumi, Kamal, "Design and Control of Atomic Force Microscopes",

American Control Conference, Denver, Colorado, USA, June 4-6, 2003.

20. El Rifai Osamah, and Youcef-Toumi, Kamal, "Trade-offs and Performance Limitations in Atomic

Force Microscope Feedback System", 2nd IFAC Symposium on Mechatronic Systems, Berkeley, CA,

USA, December 9-11, 2002.

24. V Saptari, K. Youcef-Toumi, J. Zhang, "NIR measurements of glucose in synthetic biological

solutions using high-throughput angle-tuned filter spectrometer," Proc. SPIE Int. Soc. Opt. Eng., Vol.

5325, pp. 1-10 (2004)

25. V. Saptari and K. Youcef-Toumi, "Design of a Mechanical-tunable Filter Spectrometer for Noninvasive Glucose Measurement," Journal of Applied Optics, 2004.

26. V. Saptari and K. Youcef-Toumi, "Design of a mechanical-tunable filter spectrometer for noninvasive

glucose measurement," Applied Optics, Vol 43, No. 13, pp. 2680-2688 (2004)

Scientific & Professional Societies:

IEEE Society - Member

ASME Society - Member

Sigma Xi Society - Elected Member

Honors & Awards:

Presidential Young Investigator, National Science Foundation Award in Recognition of Research and Teaching Accomplishments. (A two- year appointment.), 1987

Carl Richard Soderberg Career Development Chair, Professorship in Power Engineering. 1988 - 1990

Winner of the Best Paper Award of the ASME Journal of Dynamic Systems, Measurement and Control. 1999

Institutional and Professional Service in the last five years:

National Science Foundation, Washington, DC, review committees - 1987 - present

ASME Journal of Dynamic Systems Measurement and Control - Associate Editor - 1989 - 1992

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