

AHMAD A. SMAILI

A. PERSONAL AND BACKGROUND INFORMATION

Personal Information

Associate Professor, Chairperson
Mechanical and Mechatronics Engineering Department
Hariri Canadian University
Meshref
Lebanon
Phone: (+961) 3-203357
e-mail: smailiaa@hcu.edu.lb

Education

Ph.D. in Mechanical Engineering, December 1986
Tennessee Technological University, Cookeville, Tennessee, USA
Dissertation: *Kinematic and Elastic Error Correction of 6R-DOF Manipulators and Stepper Motor Driven Experimental Manipulator Design*

M.S. in Mechanical Engineering, December 1981
Tennessee Technological University, Cookeville, Tennessee, USA
Thesis: *Investigation of Radial Brakes and Clutches as Elastic Systems.*

B.S. in Mechanical Engineering, December 1979
Tennessee Technological University, Cookeville, Tennessee, USA

Work Experience

Associate Professor, Chairperson October 2006-present
Department of Mechanical and Mechatronics Engineering,
Hariri Canadian University, Meshref, Lebanon

Associate Professor, October 1999-2006
Department of Mechanical Engineering,
American University of Beirut, Beirut, Lebanon

Professor, Promoted to a full Professor while on leave, June 2000;
Associate Professor, August 1995 - 1999
Assistant Professor, August 1991 - July 1995
Department of Mechanical Engineering,
Tennessee Technological University, Cookeville, Tennessee, USA

Assistant Professor, August 1987 - May 1991
Department of Mechanical and Nuclear Engineering,
Mississippi State University, Mississippi, USA

B. RESEARCH

Research Interests

Robomechs (A new class of linkage arms)

Mechatronics

Finite element applications

Mechanical design of robotic systems

Active and passive damping for vibration control of mechanical systems

Kinematic analysis and synthesis of mechanisms

Dynamic modeling of mechanical systems

Text Books

Applied Mechatronics (with F. Mrad), Oxford University Press, 2007.

Finite Elements Applications in Mechanical Systems Design - The manuscript is being prepared in collaboration with Dr. Camille Issa, Chairman of the Civil Engineering Department at the Lebanese American University in Byblos, Lebanon. Several chapters of the manuscript have been completed. The manuscript features Matlab-based programs for static and dynamic analysis of various mechanical systems. It also includes many examples using commercial packages.

Mechatronics - A chapter written for *The Industrial Engineering Applications and Practice: Users Encyclopedia* (1997); Editor in chief: Professor Anil Mital, University of Cincinnati; **invited**.

Published Refereed International Journal Articles

1. **A. Smaili** and N. Diab , 2006, "Optimum Synthesis of Mechanisms for Hybrid Task Applications Using Ant-Gradient Method," *Mechanism and Machine Theory* (in Press).
2. **A. Smaili**, N. Diab, 2005, "Shape Optimization for Closed Path Generation of Planar Mechanisms," *ASME Journal of Mechanical Design* (in press).
3. C. Antonios, D. Inman, and **A. Smaili**, 2005, "Experimental and Theoretical behavior of Self-healing Bolted Joints," *Journal of Intelligent Material Systems and Structures* (in press).
4. **A. Smaili** and S. Chehade "Effective Integration of Mechatronics into Mechanical Engineering Curriculum: A Cooperative, Project-Based Learning Model with Seamless Lab/Lecture Implementation," *International J. of Engineering Education*, **21** (4), pp. 739-744.
5. **A. Smaili**, N. Attalah, and F. Zeieddine, "OptimaLink: A matlab/Simulink Based Code for Precision-positions and Optimum Synthesis of Four-Bar Mechanisms," *International J. of Engineering Education*, **21** (5), 2005, pp. 874-884.
6. **A. Smaili** and N. Attalah, 2005, "A Three dof's Robomech with Three end-effectors: Architecture, Optimum Synthesis and Introduction to Compliant Robomechs" *Mechanism and Machine Theory*, **40**(10), pp. 1195-1206.
7. **A. Smaili**, N. Diab, and N. Attalah, "Optimum Synthesis of Mechanisms Using Tabu-Gradient Search," *J. Mechanical Design*, **127**(5), pp. 917-923.
8. R. Hamade, F. Zeineddine, B. Akle, and **A. Smaili** "ModelAngelo: A Subtractive 5-Axis Robotic Arm for Rapid Prototyping," *J. Robotics and Computer Integrated Manufacturing*, v21, n2, pp. 133-144, 2005.
9. M. Sannah and **A. Smaili**, "Vibration Control of Smart Flexible Mechanism Systems: Experiment and Simulation," *ASME Journal of Mechanical Design*, v120, n2, pp. 316-326, 1998; (presented at the 1996 ASME 24th Biennial Mechanisms Conference, paper MECH-B-M1).

B. RESEARCH (Continued)

10. A. **Smaili** and I. Bagci, "Finite Element and Experimental Modal Analyses of a Mechanism System with Link Offsets," *ASME Journal of Mechanical Design*, v120, n3, pp. 401-403, 1998; (presented at the 1996 ASME 24th Biennial Mechanisms Conference, paper MECH-C-T1).
11. A. **Smaili**, "Robomechs: A new Class of Linkages for Multi-task Applications", *Mechanism and Machine Theory*, v30, n 2, pp. 169-176, 1995.
12. A. **Smaili**, M. Kopparapu, and M. Sannah, "Elastodynamic Response of a DC Motor Driven Flexible Mechanism System with Compliant Drive Shaft Components During Startup," *Mechanism and Machine Theory*, v31, n5, pp. 659-672, 1996.
13. A. **Smaili**, M. Sannah, and M. Kopparapu, "Elastodynamic Response of Mechanism Systems Including Compliance of Their Drive and Load Shafts," *Journal of Applied Mechanisms and Robotics*, v4, n2, pp. 44-57, 1997.
14. A. **Smaili** and M. Sannah, "Robomech-II: A Stack of two Four-Bar Mechanisms for Dual-Function Task Applications," *Mechanism and Machine Theory* v33, n5, pp. 639-646, 1998 (Also appeared in the Proceedings of the Ninth World Congress on the Theory of Machines and Mechanisms, Milano, Italy, 1995).
15. A. **Smaili** and M. Khetawat, "On the Dynamic Modeling of Automotive Engine Crankshafts," *Mechanism and Machine Theory*, v29, n7, pp. 995-1006, 1994.
16. A. **Smaili** and J. Scardina, "A Cornerstone Experience in Design and Manufacturing Education," *International Journal of Applied Engineering Education*, v10, nx, pp. xxx-xx, 1994.
17. A. **Smaili**, "A Three Node-Finite Beam Element for Dynamic Analysis of Planar Manipulators with Flexible Joints," *Journal of Mechanism and Machine Theory*, v28, n3, pp. 193-206, 1993.

Articles In-Review or In-Preparataion

1. A. **Smaili**, N. Diab (S), "A New Approach for Precision/Approximate Point Synthesis of Planar Mechanisms," *Mechanism and Machine theory* (to be submitted).
2. A. **Smaili** and B. Chaaya, "A Triad-Based two-dof Robomech: Architecture and Synthesis," *Mechanism and Machine theory* (to be submitted).
3. N. Khaled, A. Ammouri, and A. **Smaili**, "Curve Representation Using Principal Component Analysis for Shape Optimization of Path Generating Mechanisms," *Mechanism and Machine theory* (to be submitted).
4. A. **Smaili**, K. Kazerounian, "Design for cultural difference", ASEE 2007 Conference (in review)
5. A. **Smaili** and M. Hassanieh, "A Flexible-Link Based Model for Compliant Mechanism Synthesis," *ASME J. of Mechanical Design* (to be submitted).
6. A. **Smaili** and N. Attalah, "Optimum Synthesis of compliant robomechs Using Tabu-Gradient Search," *J. Structural and multidisciplinary Optimization* (in preparation).
7. A. **Smaili** and M. Hassanieh, "Tabu Serach Algorithm for Compliant Mechanism Synthesis Based on Rigid-Body Building Blocks and Reduced Design Optimization Space", *ASME DETC2007* (in review).
8. A. **Smaili** and M. Hassanieh, "A Modified Real Coded Quantum Inspired Evolutionary Algorithm (MRQIE) and Flexible Link Model (FLM) for Optimum Synthesis Of Partially Compliant Mechanisms," *ASME DETC2007* (in review).
9. A. **Smaili**, M. Hassanieh, B. Chaaya, and F. Al Fares, " Optimum Synthesis of Rigid Mechanisms Using Real Coded Quantum-Inspired Evolution Algorithm with Neighborhood Search," *ASME DETC200*.

B. RESEARCH (Continued)

Full Length Refereed Papers in Conference Proceedings (At least 2 Referees)

1. **A. Smaili** and M. Hassanieh, "A Flexible-Link Model for Compliant Mechanisms Synthesis," *ASME DETC2006 Conferences*, paper # DETC2006-99715.
2. **A. Smaili** and B. Chaaya, "Stackable 5R Chains with Multiple End-Effectors: Architecture and Optimum Synthesis," *ASME DETC 2006 Conferences*, paper # DETC2006-99717.
3. N. Diab and **A. Smaili**, "Interval Analysis Based Approach to Analysis and Synthesis of Planar Mechanisms with Clearances and Tolerances," *ASME DETC2006 Conferences*, paper # DETC2006-99713.
4. F. Mrad, **A. Smaili**, and H. Maamoun, "Adaptive Control of Flexible Four-Bar Mechanism," *ASME International Conference on Advanced Intelligent Mechatronics (AIM2005)*, Monterey, California, USA
5. **A. Smaili**, N. Diab, "Shape Optimization for Closed Path Generation of Planar Mechanisms," *ASME 2005 DETC Conferences*, Paper # DETC2005-84301.
6. **A. Smaili**, F. Mrad, H. Maamoun, "Adaptive Fuzzy Logic Control of a Flexible Four-Bar Mechanism with a Smart Links" *ASME 2005 DETC Conferences*, Paper # DETC2005-85298.
- A. Smaili**, N. Diab (S), "A New Approach for Precision/Approximate Point Synthesis of Planar Mechanisms," *ASME 2005 DETC Conferences*, Paper # DETC2005-84339.
7. **A. Smaili** and B. Chaaya, "A Triad-Based two-dof Robomech: Architecture and Synthesis," *ASME 2005 DETC Conferences*, Paper # DETC2005-85200.
8. N. Khaled and **A. Smaili**, "Curve Representation Using Principal Component Analysis for Shape Optimization of Path Generating Mechanisms," *ASME 2005 DETC Conferences*, Paper # DETC2005-85247.
9. **A. Smaili** and N. Attalah, "A Tabu-Gradient Search-Based Optimization Technique for Synthesis of Mechanisms," *ASME Design Technical Conference*, 2004, DETC2004-57420.
10. **A. Smaili**, F. Mrad and H. Maamoun, "Neuro-Fuzzy Control of Smart Flexible Mechanis", *ASME Design Automation Conference*, 2003, DETC2003/EDC-34381.
11. **A. Smaili** and F. Zeineddine, "SOFTLINK: A Matlab-Simulink Based Code for the Analysis, Synthesis, Optimization, and Simulation of Mechanism," *ASEE Annual Conference*, 2003.
12. **A. Smaili**, R. Hamade, F. Zeineddine, and B. Akle, "Modelangelo: A Rapid Prototyping System For Polystyrene," *ASME Design Automation Conference*, 2002, DETC2002/DAC-34137.
13. **A. Smaili**, "Design for Cultural Difference," *ASME Design Automation Conference*, 2002, DETC2002/EDC-34381.
14. **A. Smaili**, "A Model for Integrating Mechatronics into Mechanical Engineering Education" *ASEE annual Conference*, 2002.
15. **A. Smaili**, "Robomechs based on the 7R-Chains," *ASME 26th Biennial Mechanisms Conference*, 2000, Paper # DETC2000/MECH-14134.
16. **A. Smaili** and A. Deshpande, "Effect of Passively-damped Coupling and Shaft on the Dynamic Response of Flexible Mechanism Systems," *6th Applied Mechanisms and Robotics Conference*, 1999, Paper No. AMR99-038.
17. C. Sisemore, **A. Smaili**, and C. Darvennes, "Experimental Measurement of Compressional Damping in an Elastic_viscoelastic-Elastic Sandwich Beam," *ASME International Exposition Conferences*, 1999.
18. S. Canfield, G. Kolanupka, and **A. Smaili**, "Optimal Synthesis of a Robomech: Procedure and Application," *ASME 25th Design Automation Conference*, 1999, Paper # DETC99/DAC-8669.
19. **A. Smaili**, "A 4-dof Robomech with Four End-effectors," *IFTOMM World Congress*, Oulu, Finland, 1999.

B. RESEARCH (Continued)

20. C. Sizemore, **A. Smaili**, and R. Houghton, "Passive Vibration Damping of Flexible Mechanism Systems: Experimental and Finite Element Investigations," *IFTOMM World Congress*, Oulu, Finland, 1999.
21. C. Sisemore and **A. Smaili**, "A Simple Finite Element Based Model for a Constrained-Layer of Viscoelastic Material (Part-I): Experimental Verification and Comparison with Analytical Models," *ASME 25th Biennial Mechanisms Conference*, 1998, Paper No. DETC98/MECH-5948.
22. C. Sisemore and **A. Smaili**, "A Simple Finite Element Based Model for a Constrained-Layer of Viscoelastic Material (Part-II): Application to Flexible Mechanism Systems," *ASME 25th Biennial Mechanisms Conference*, 1998, Paper No. DETC98/MECH-5949.
23. **A. Smaili**, "A Finite-Element-Like Package for Complete Modeling of Mechanical Systems", *5th Applied Mechanisms and Robotics Conference*, 1997, Paper No. AMR97-021.
24. **A. Smaili**, "Robomechs for Multi-Function Tasks", *5th Applied Mechanisms and Robotics Conference*, 1997, Paper No. AMR97-068.
25. M. Sannah and **A. Smaili**, "Analytical Investigation on Elastodynamic Vibration Suppression of a Flexible Four-Bar Mechanism System Featuring a Smart Coupler Link and Multivariable Optimal Regulator," *ASME 16th biennial Conference on Vibration and Noise*, 1997, paper DETC97/VIB-3779.
26. **A. Smaili**, *Mechatronics - A chapter written for The Industrial Engineering Applications and Practice: Users Encyclopedia* (1997); Editor in chief: Professor Anil Mital, University of Cincinnati; **invited**.
27. **A. Smaili** and O. Rick, "Robomech-III: A Stack of Three Four-Bar Mechanisms for Triple-Function Task Applications," *ASME 24th Biennial Mechanisms Conference*, 1996, paper MECH-A-W2.
28. **A. Smaili**, I. Bagci, and M. Sannah, "Isoparametric Timoshenko Elements for Dynamic Analysis of Structures and Mechanical Systems," *ASME 15th Biennial Conference on Vibration and Noise*, 1995, DE-Vol. 84-2, volume 3, part B, pp. 765-773.
29. M. Sannah, **A. Smaili**, and T. Lahdhiri, "Digital Optimal Multivariable Control of a Smart Structure Featuring Piezoelectric Sensors and Actuators," *ASME 15th Biennial Conference on Vibration and Noise*, 1995, DE-Vol. 84-3, volume 3, part C, pp. 67-76.
30. **A. Smaili** and R. Yerra, "Experimental and Finite Element Study on the effect of Viscoelastic Damping on the Elastodynamic Response of a Single-Link Robotic Arm," *4th Applied Mechanisms and Robotics Conference*, 1995, Paper No. AMR 95-016.
31. **A. Smaili** and I. Bagci, "On Critical Geometry of Planar Four-Bar Mechanism," *4th Applied Mechanisms and Robotics Conference*, 1995, Paper No. AMR 95-001.
32. **A. Smaili** and J. Abraham, "A New Model for Estimating Gear Mesh Stiffness," *4th Applied Mechanisms and Robotics Conference*, 1995, Paper No. AMR 95-043.
33. **A. Smaili** and M. Sannah, "Estimation of Critical Damping in Robot Joints and Identification of the Joint for Design with Most Effective Damping Treatment," *23rd ASME Biennial Mechanisms Conference*, 1994, DE-Vol. 71, pp. 1-9.
34. **A. Smaili** and M. Sannah, "A New Dynamic Model for Manipulators," ASME Book No. G00818, DE-Vol. 57, pp. 69-78. *ASME 14th Biennial conference on Mechanical Vibration and Noise*, 1993.
35. **A. Smaili** and H. Tylicki, "Computer Aided Design of Transmission Shafts," *ASME Fourth Symposium on Advanced Automotive Technologies*, 1993, DSC-Vol. 52, pp. 113-126.
36. **A. Smaili**, M. Koppurapu, and M. Sannah, "Influence of Drive Train Compliance on Dynamic Response of Linkage Mechanisms," *Third Applied Mechanisms and Robotics Conference*, 1993, Paper No. AMR 93-064.
37. **A. Smaili** and J. Scardina, "A Model Capstone Design and Manufacturing Course in Mechanical Engineering Curriculum," proceedings of the *1993 ASEE Southeastern Section*, 1993.
38. K. Hodge, R. Taylor, and **A. Smaili**, "Mechanical Engineering Students and Faculty Perceptions of Team Projects in Engineering Courses," *Mechanical Engineering News*, Vol 28, No. 4, Nov. 1991, pp.11-16.

B. RESEARCH (Continued)

39. **A. Smaili** and H. Tylicki, "Use of Truth Tables and K-Maps to Define Direction of Forces in Gearing for Automating Fatigue Design of Shafts," *Proceedings of the 2nd National Applied Mechanisms and Robotics Conference*, 1991, P-5, S-IVA.
40. **A. Smaili** and H. Tylicki, "A Four-Node Plane Frame Finite Element For The Analysis of Planar Linkage Mechanisms," *Proceedings of the 2nd National Applied Mechanisms and Robotics Conference*, 1991, P-2, S-IXA.
41. **A. Smaili** and H. Tylicki, "The Use of Matlab for the Analysis and Synthesis of Planar Mechanisms," *Proceedings of the 2nd National Applied Mechanisms and Robotics Conference*, 1991, P-2, S-XA.
42. **A. Smaili**, "A Three-Node Finite Beam Element and Dynamic Analysis of Robot Manipulators," *Proceedings of the 1st Applied Mechanical Systems Design Conference*, 1989, P-9, S-4.
43. **A. Smaili** and K. Bangalore, "A Linkage Arm for Dual-Task Applications," *Proceedings of the 1st Applied Mechanical Systems Design Conference*, P-20, S-8.
44. **A. Smaili** and K. Bangalore, "A New Approach to Redundancy Resolution of Planar Redundant Manipulators," *Proceedings of the 1st National Applied Mechanisms and Robotics Conference*, 1989, P-6, S-8A.
45. **A. Smaili** and C. Bagci, "An Experimental, Programmable, Stepper Motor Driven 6-DOF Robot Arm Manipulator," *Proceedings of the 10th Applied Mechanisms Conference*, 1987, Vol. II, S-6C.
46. **A. Smaili** and C. Bagci, "Finite Element Processes for Dynamic Analysis and Elastic Error Correction of Spatial Robotic Systems," *Proceedings of the 10th Applied Mechanisms Conference*, 1987, Vol. II, S-4C.
47. **A. Smaili** and C. Bagci, "Stepper Motors, Their Control and Applications in Generating Programmed Industrial Motions In Mechanical and Robotic Systems," *Proceedings of the 9th Applied Mechanisms Conference*, 1985, Vol. I, S-IIB.
48. **A. Smaili**, "Kinematic Motion Parameters of Six-Degrees-of-Freedom Industrial 3-D Robot Manipulator with Linear and Angular Offsets for Programmed Body Guidance and Path Generation," *Proceedings of the 9th Applied Mechanisms Conference*, 1985, Vol. II, S-VIII,A.
49. **A. Smaili**, "Elastic Analysis of Radial Drum Brakes and the Actual Contact Pressure Distribution Using Polar Finite Stress Elements," *Proceedings of the 7th Applied Mechanisms Conference*, 1981, P-LVIII.
50. C. Bagci and **A. Smaili**, "Computer Aided Design of Radial Brakes and Clutches as Elastic Systems," *2nd ASME International Computers in Engineering Conference*, 1982, Vol. II.

Presentations at Local and Regional Conferences

1. **A. Smaili**, "Mechatronics: A New Paradigm to Integrative Creative Learning," PAAET, Kuwait, May 23 (2005) (Invited)
2. **A. Smaili**, "Sustainable Quality Learning," AUB Sustainability Forum, April 8 (2005)
3. **A. Smaili**, "NI DAQ/LabVIEW: Integration Tools for Mechatronics," National Instruments Academic Day, March 15-16, Bahrain (2005) (Invited)
4. **A. Smaili**, "FEM Applications in Vibration Control of Flexible Mechanical Systems," CAMs Workshop on Finite Element Analysis; AUB (2001).
5. **A. Smaili**, "Robomechs: A New Class of Linkage Arms for Multi-Functions Task Applications," 14th Science meeting, National Council for Scientific Research, Beirut, Lebanon (2001).
6. **A. Smaili**, "Mechatronics: A New Paradigm in Engineering Education," 14th Science meeting, National Council for Scientific Research, Beirut, Lebanon (2001).

C. TECAHNING

Courses Taught

Taught over 20 different undergraduate and graduate courses in the following areas:

Mechatronics and embedded control
MEMS
Mechanical design
Design of Mechanisms
Robotics
Dynamics and vibrations
Linear and nonlinear finite elements: theory and applications
Vibration control
Modal Analysis and Testing

Courses and Program Developed

Courses developed since 1987 include:

Mechanics and Control of Robot Manipulators (MSU)
Mechanical Dynamics (MSU)
Design of Mechanisms (MSU, AUB)
Finite Element Methods for Mechanical Engineers (TTU)
Mechatronics and Intelligent Machines Engineering-I (TTU, AUB)
Mechatronics and Intelligent Machines Engineering-II (TTU, AUB)
Analytical and Experimental Modal Analysis (AUB)
Vibration control (AUB)
MEMS (AUB)
Instrumentation and Measurements (AUB)

Program developed

Co-Chaired a committee that developed a plan to start a focus area in mechatronics at AUB.

Laboratory Developed

Mechatronics and Intelligent Machines laboratory at two universities: TTU and AUB. The laboratory complements two (AUB) courses, MECH 530 and MECH 643 *Mechatronics for Intelligent Machines Engineering -I and -II*. The laboratory provides mechanical engineering students with practical hands-on experience on the design, control, development and testing of mechatronic systems that have potential societal benefits. Students engage in a cooperative, project-based experience requiring the integration of sensors, actuators, mechanical drives, and embedded technology to realize smart machines. Major Lab equipment for the Lab at TTU was acquired through an NSF Grant. A similar grant from ASHA was used to retrofit the Lab at AUB.

Instrumentation and Measurements Laboratory- This Lab was established with the help of a grant from ASHA. The Lab features latest National Instruments *Data Acquisition software/ hardware technology*.

Modal Testing Laboratory - The lab contains a Bruel and Kaer Pulse station analyzer with support hardware and software and a National Instrument Dynamic signal analyzer.

Control and Automation Laboratory – This lab is under development.

C. TEACHING (Continued)

Ph. D. Dissertation Supervised

Mohammad Sannah, "Active Control of Elastodynamic Vibrations of a Four-Bar Mechanism System with a Smart Coupler Link Using Optimal Multivariable Control: Simulation and Experimental Implementation," Ph. D. Dissertation, 1995 (TTU)

MS Thesis Supervised

1. Henry Tylicki, "Computer_Aided Design of Transmission Shafts," Masters Thesis, 1991 (MSU)
2. Rajaram Yerra, "Effect of Joint Compliance and a Study of Viscoelastic Damping on the Response of Manipulators: Finite Element and Experimental Verification for a One-Link Robot," Masters Thesis, 1993 (TTU)
3. Murali Koparapu, "A Study on Dynamic Modeling of Machine Components and Elastodynamic Response of Mechanisms Systems During Start-Up," Masters Thesis, 1994 (TTU)
4. John Abraham, "Gear-Mesh Stiffness and Dynamic Response of Spur-Gear Planetary Gear Trains," Masters Thesis, 1995 (TTU)
5. Ismail Bagci, "Finite Element and Experimental Modal Analyses of a four-Bar Mechanism System and its Critical Geometry," Masters Thesis, 1995 (TTU)
6. Carl Sisemore, "A Simple Finite element Based Model for a Constrained Layer of Viscoelastic Material: Experimental and Analytical Verification and Application to Flexible Mechanisms," Masters Thesis, 1998 (TTU)
7. Anand Deshpande, "Effect of Viscoelastic Damped Coupling and Drive Shafts Segments on the Response of Flexible Mechanism System," Masters Thesis, 1998 (TTU)
8. Pierre Neemtallah, "Adaptive Force Control of Robotic Manipulators," Masters Thesis, 2001 (AUB)
9. Hadi Maamoun, "Active Vibration of Flexible Mechanisms Using Adaptive Fuzzy and Neural-Network Based Controllers" Masters Thesis, 2004 (AUB)
10. Naji Attalah, "Optimal Synthesis of Rigid and Complaint Robomechs" Masters Thesis, 2004, AUB.
11. Nadim Diab, "On Optimum Synthesis of Rigid-Body Mechanisms" Masters Thesis, (2005)
12. Jamal Hilal
13. Khaled Joujou
14. Mazen hassanieh
15. Bachir Chaaya

MS Thesis under Supervision

1. Bilal Chehad (HCU)
2. Khaled (HCU)

Selected Projects Supervised

1. "Stair climbing vehicle," TTU, 1993.
2. "Ball Delivery System," TTU, 1997; the vehicle won Second Place Award in the ASME National Design Competition, 1998.
3. "Surveillance Vehicle," TTU, 1995; the vehicle won third place Award in the ASME Region XI student design competition, 1997.
4. "FEA Analysis of Accuride Storage Bin," TTU, 1999.
5. "Flying Vehicle," AUB, 2000.
6. "Smart Plotter," AUB, 2000.
7. "Direct Numerical Control on a Milling Process," AUB, 2000*.

C. TEACHING (Continued)

8. "Flying Vehicle – II," AUB, 2001.
9. "Stair Climbing Robot," AUB, 2001.
10. "Autonomous Wooden Pole Climbing Robot," AUB, 2001
11. "ModelAngelo: Prototyping Machine," AUB, 2001*
12. Piano Tuner*
13. *El Periodico: The Multiple Newspaper Vending Machine*
14. *A Computer-Controlled Robot for Data Acquisition*
15. *The PostBot* (with Dr. Abdallah)
16. *Omni-directional Vision Controlled Autonomous Robot* (with Dr. Abdallah)
17. *BinBot: The Bin Loader Robot* (with Dr. Abdallah)
18. *Adaptive Solar Panel* (with Dr. Abdallah)
19. *AUB's First Active Vision Head* (with Dr. Abdallah)
20. *The design of a powered mobility for disabled children* (with S. Abdallah and K. Khalaf)
21. *Flying Vehicle* (with S. Abdallah)
22. *Design and build a house-recycling center*
23. *Design and Build an optimized hybrid powered vehicle* (with A. Shehadeh)
24. *Design and build a vehicle to navigate rough terrain* (with S. Abdallah and K. Khalaf)
25. *Design and Build a Wheeled/ Legged Vehicle* (with S. Abdallah)
26. *Develop a completely autonomous Guitar tuner*
27. *Design and build a smart security system for the home of a blind*
28. *Modeling and Control of a Helicopter* (with S. Abdallah and K. Khalaf)
29. *Mobile Robot Navigation in a Rough Terrain*, 2004 (with S. Abdallah and K. Khalaf)
30. Smart hip implant, 2004 (with K. Khalaf)
31. Wireless traffic regulator, 2004
32. Metal pole climbing robot, 2004
33. Smart security system, 2004
34. S.C.H.R: The smart and handy construction robot**, 2004 (w. M. Mabsout)
35. SmartHome Control System for Energy Generation and Saving, 2005
36. Air Cushion Vehicle Hovercraft, 2005
37. Design and Development of Grocery Bags Recycling Machine, 2005
38. STAR: A Self Track Assembly Robot, 2005
39. Autonomous Machine to Cover Unfinished Walls with a Thin Cement Layer, 2005
40. The E-Nurse, 2005⁺

* Projects won ME's Dean's Creative Achievement Awards (2000, 2001, and 2002)

** Project won CEE's Dean's Creative Achievement Award (2004)

⁺ Supervised a ECE Team

D. PROFESSIONAL ACTIVITIES

Book Review

Introduction to Mechatronics and Measurement Systems, D. Alciatore and M. Hstand, McGraw-Hill, 1997

Committee Assignments

1. Parent's Committee, ACS.
2. Parent's Character Education Committee, ACS.
3. University Teaching Excellence Committee, 2005
4. FEA Mechatronics Committee (Co-Chairperson), 2005
5. University Faculty Senate, 2003-2005.
6. 2nd and 3rd FEASC Organizing Committee, 2003, 2004.
7. University Accreditation Task Force on Integrity, 2002-2003.
8. Graduate Studies Committee (Chairperson), 2001 – 2005.
9. Students' Affairs Committee, 2001 – 2003.
10. ME Department ABET Committee, 2001- present.
11. FEA ABET Committee, 2001- present
12. Faculty/Student Appraisal Committee, 2000-present (AUB)
13. Computer Planning Committee, 2000-present (AUB)
14. Mechanical Engineering Undergraduate Curriculum Committee (Chairperson), 1990-1991 (MSU), 1997-1999 (TTU)
15. Design Faculty Search Committee (Chairman), 1998, 1999 (TTU)
16. Member, Distance Learning Committee, 1997-1999 (TTU)
17. Member, ABET Engineering Criteria 2000 Committee, 1998-1999 (TTU)
18. Member, *Design Integration in the Curriculum*, 1993-1999 (TTU).
19. Engineering College Faculty Council, 1991 (MSU)

Consulting

PAAAET, Kuwait
Cedar Environmental, Lebanon
Flexible Flyer Company, West Point, MS.
Marine Gears, Greenville, MS.
Waste Policy Institute, Washington, D.C.
Eagles Enterprise, Livingston, TN.
UTSI CSTAR Project, Tullahoma, TN.
TSU Telescope development project, Nashville, TN.
GEKA Thermal Systems, Atlanta, GA.
EZ-Scaffold, Nashville, TN.

Self-Improvements Activities

Participated in the following activities:

1. *ASME Design Technical Conference*, Salt Lake City, September 2006.
2. *ASME Design Technical Conference*, Chicago, September 2005.
3. *Covey's Seven Habits of Highly Effective People Workshop*, ACS, 2005
4. *ASME Design Technical Conference*, Salt Lake City, September 2004.

D. PROFESSIONAL ACTIVITIES (Continued)

5. *ASME Design Technical Conference*, Chicago, September 2003.
6. *ASME Annual Conference*, Nashville, June 2003.
7. *WebCT (Web Course Tools)*, AUB, Lebanon, 6-8 October 2001
8. *Teaching Portfolio Workshop*, AUB, December 13, 2002.
9. *ASME Design Technical Conference*, Montreal, September 2002.
10. *ASME Annual Conference*, Montreal, June 2002.
11. *Seminars on Teaching and Learning Excellence*, AUB, Spring Term, 2003 (8-weeks workshop)
Cooperative Learning Workshop, AUB, 2000.
12. *ASME Design Technical Conference*, Baltimore, MD, September 2000.
13. *Tenth World Congress on the Theory of Machines and Mechanisms*, June 19- 25, Oulu, Finland, 1999.
14. *Service Excellence Workshop*, AUB, 14 May 2001
15. *Web Site Creation and Publication with Front Page*, AUB, Lebanon, 2-5 October 2001
16. *Pacific Crests' Process Education Workshop*, Cookeville, TN, 1998.
17. *ASME Design Technical Conference*, Atlanta, Ga, September 1998.
18. *ASME-Sponsored Workshop on Mechatronics Systems Design with Applications: Integrating Mechanical, Electronic and Control Engineering*, Boston, June 1996.
19. *Motorola-Sponsored University Symposium*, Austin, June 1997.
20. *ASME 16th Biennial Conference on Vibrations and Noise*, Irvine, CA, September 1997.
21. *Fourth, Fifth, and sixth National Applied Mechanisms and Robotics conference*, November 1995/7/9.
22. *ASME 15th Biennial Conference on Vibrations and Noise*, Boston, MA, September 1995.
23. *Ninth World Congress on the Theory of Machines and Mechanisms*, Aug 29-Sep 3, Milan, Italy, 1995.
24. *Seminar on power amplifiers, APEX Microtechnology Corporation*, Oak Ridge, TN, February 1994.
25. *ASME Design Technical Conference*, Minneapolis, MN, September 1994.
26. *Course on Nonlinear Finite Element Analysis*, in Palo Alto, CA, July 18-22, 1994.

Other Activities

1. Chairperson, MME Department, 2006-present.
2. Acting Chairperson of ME Department at AUB, July-August, 2003.
3. Co-organizer of the symposium "*Engineering Design and Culture*," ASME Design Technical Conferences, September 29-Oct -2, 2002, Montreal, Canada.
4. Chairman, Technical Committee for Standards on Portable Fire Extinguishers, LIBNOR, 2000 – present.
5. Member, Technical Committee of the Fourth conference on Lebanese Industrial Research Achievements organized by the National Council for Scientific Research and the Association of Industrialists, July 2000.
6. Organizer, Human Powered Vehicle Competition, AUB, 2000 and 2001.
7. Co-organizer of the symposium "*Application of Smart Materials to High Speed and Accuracy Machines*," ASME Design Technical Conferences, September 13-16, 1998, Atlanta Georgia.
8. Session Chairman and Vice-Chairman: 4th, 5th, 6th and 7th National Applied Mechanisms and Robotics conference, 1995-present.
9. Faculty Advisor: *ASME Student Section Chapter*, 1989- present (MSU, TTU, and AUB).
10. Paper Reviewer for the following Journals:
 - a. *International Journal of Mechanisms and Machine Theory*
 - b. *ASME Journal of Mechanical Design*
 - c. *International Journal of Applied Mechanisms and Robotics*
 - d. *International Journal of Precision Engineering*
 - e. *Journal of Sound and Vibration*
 - f. *Journal of optimal control*

E. HONORS AND AWARDS

1. Textbook contract with Oxford University Press.
2. Teaching Excellence Seminar, AUB, 2005 (Invited; with M. Tabbal)
3. Invited guest speaker at the National Instrument Academic Day, Beirut, 2005
4. Invited consultant on Mechatronics Education, PAAET, Kuwait, 2005
5. Invited guest speaker at the National Instrument Academic Day, Bahrain, 2005
6. Recipient of the *Teaching Excellence Award*, AUB, 2004.
7. Nominated for the *Teaching Excellence Award*, AUB 2003.
8. ASME Certificate of Appreciation for organizing *Design for Culture Symposium*, DETC 2002
9. Teaching Excellence Seminar, AUB, 2003 (Invited; with N. Ghaddar)
10. Howard Watrous Award for unique contributions to the Science of Mechanisms and Robotics, Fifth Applied Mechanisms and Robotics Conference, 1997.
11. Kinslow Research Award for best technical journal paper TTU, 1999.
12. Kinslow Research Award for best technical journal paper TTU, 1996.
13. Who Is Who in Science and Engineering, 1996, 3rd edition.
14. Who Is Who in the South and Southwest, 1997-1998, 25th edition.
15. Who Is Who in America, 1997 and 199 (51st and 52nd editions).
16. Who Is Who in the World, 15th and 17th Editions.
17. Purple Shaft Trophy, Students Choice Award, Best ME Professor, PI TAU SIGMA, Mississippi State University, 1990.
18. Purple Shaft Trophy, Students Choice Award, Best ME Professor, PI TAU SIGMA, Mississippi State University, 1989.
19. University-wide Outstanding Faculty Member, Student Association, Mississippi State University, 1989.
20. Best ME faculty, ASME student section, Tennessee Technological University, 1986.
21. Pi Tau Sigma, Mechanical Engineering Honorary, 1978
22. Tau Beta Pi, Engineering Honorary, 1985
23. Sigma Xi, The Research Society, 1990
24. Award of Merit, Proctor and Gamble, Student paper contest, 7th Applied Mechanisms Conference, Kansas City, MO. December 1981.

