

# MOHSEN (MO) SHAHINPOOR, Ph.D., PE

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## **Objective**

To support a challenging and rewarding academic position in an accredited university that will involve teaching of undergraduate and graduate engineering courses, academic leadership in establishing unique and emerging multi-disciplinary research thrusts, teams and centers and attracting substantial multi-year research and educational funding and resources for the university.

## **1. Professional Experience**

**Richard C. Hill Professor and Chair** (7/1/2007-Continuing)

Department of Mechanical Engineering  
College of Engineering  
University of Maine, Orono, ME 04489  
[www.umaine.edu/MechEng/](http://www.umaine.edu/MechEng/)

**Faculty Advisor: COE Biomedical Engineering Track** (7/1/2007-Continuing)

**Director: Biomedical Engineering Laboratory** (9/14/2007-Continuing)

<http://www.umaine.edu/mecheng/BMERobotics/index.html>

**Director: Advanced Robotics/Robotic Surgery Laboratory** (9/14/2007-Continuing)

College of Engineering  
University of Maine, Orono, ME 04489  
<http://www.umaine.edu/mecheng/faculty-and-staff/mohsen-mo-shahinpoor-ph-d-p-e/>

**Cooperating Professor** (11/1/2007-Continuing)

AEWC Advanced Structures & Composite Center  
College of Engineering  
University of Maine, Orono, ME 04489  
<http://www.aewc.umaine.edu/>

**Professor** (10/1/2007-Continuing)

Graduate School of Biomedical Sciences (GSBS)  
College of Engineering  
University of Maine, Orono, ME 04489  
<http://www.biomedsci.umaine.edu/>

**Chair: Oversight Committee** (8/1/2007-Continuing)

Small Animal Research Facility (SARF)

College of Engineering  
University of Maine, Orono, ME 04489  
<http://www.engineering.umaine.edu/>

**Research Professor of Surgery** (7/1/2002-6/30/2007)  
Department of Neurological Surgery  
Division of Surgery, School of Medicine  
University of New Mexico, Albuquerque, N

**Director: Artificial Muscle Research Institute (AMRI)** (7/1/2002-6/30/2007)  
School of Medicine, Division of Neurological Surgery  
University of New Mexico, Albuquerque, NM

**Chief Scientist and Director of Biomedical Products** (7/1/2002-6/30/2007)  
Environmental Robots Incorporated  
909 Virginia Av., NE, Suite 205  
Albuquerque, New Mexico 87108  
**(in this capacity he managed as PI an NRL funded research group to the tune of \$2.4m over a period of 4 years on developing biomimetic reconnaissance swimming robotic structures using ionic polymer metal composites (IPMCs) as fish fin actuators and sensors. He also managed as PI a NASA-JSC funded research and research group to the tune of \$600k (phase I and II) over a period of 3 years on developing polymeric artificial muscles for UAVs).**

**Regents Professor of Mechanical Engineering** (8/13/1984-6/30/2002)  
Department of Mechanical Engineering, School of Engineering  
University of New Mexico, Albuquerque, NM

**Professor of Surgery and Biomedical Engineering** (6/14/1996-6/30/2002)  
Division of Neurological Surgery  
School of Medicine,  
University of New Mexico, Albuquerque, NM

**Co-Director with Dr. Ed Benzel (MD, Neurosurgeon)** (1/4/1997-6/30/2002)  
Spine Biomechanics Laboratory,  
Neurological Surgery, School of Medicine  
Mechanical Engineering, School of Engineering  
University of New Mexico, Albuquerque, NM

**Licensed Professional Engineer (PE)**  
State of Maine, License No. 11853, (1/20/09-Continuing)  
State of New York, License No. 58845, (9/15/82 Continuing)  
State of New Mexico License No. 9353, (6/16/82-Continuing)

**Consultant:** Sandia National Laboratories, Albuquerque, NM (1/15/1985-9/15/2002)

**Consultant:** Los Alamos National Laboratory, Los Alamos, NM (9/12/1988-8/15/2000)

**Chairman:** Manufacturing Engineering and Robotics, School of Engineering, University of New Mexico, (8/21/1994-8/20/1999)

**Regents Professor (Endowed Chair),** School of Engineering and School of Medicine (7/1/1988-6/30/2002)

**Associate Dean of Engineering,** School of Engineering, University of New Mexico, Albuquerque, New Mexico, USA (1/13/1993-1/4/1995)

**Research Professor,** Divisions of Engineering & Applied Science and Geological & Planetary Sciences, California Institute of Technology (CALTECH), Pasadena, California, USA (8/15/91-9/30/93)

**Halliburton (Endowed Chair) Professor of CAD/CAM, CIM & Robotics,** College of Engineering, University of New Mexico, Albuquerque, New Mexico, USA (8/15/87-1/15/91, also 8/15/95-8/15/98)

**Director:** CAD/CAM, CIM & Robotics Laboratories, University of New Mexico, Albuquerque, NM, USA (9/14/87-12/31/2000)

**Director:** Intelligent Materials, Structures and Systems Laboratory, University of New Mexico, Albuquerque, NM, USA (4/13/92-12/31/2001)

**Chairman & Professor:** Department of Mechanical Engineering The University of New Mexico, Albuquerque, NM, USA (8/13/84-6/1/88)

**Chairman:** Manufacturing Engineering & Robotics Undergraduate Program, College of Engineering, The University of New Mexico, Albuquerque, NM, USA (9/1/87-12/31/2000)

**In this endeavor he initiated the program in the School of Engineering at UNM. Assembled a group of interested faculty together and developed the curriculum for Manufacturing Engineering and Robotics as an optional multidisciplinary program across the five Departments of Computer Science and Engineering, Electrical and Computer Engineering, Civil and Environmental Engineering (in the context of environmentally conscious and compliant manufacturing), Chemical Engineering and Mechanical Engineering. Submitted the curriculum through the undergraduate curriculum committee for approval, the School of Engineering Curriculum Committee for approval, The Faculty Senate Curriculum Committee for approval all the up to the New Mexico State Legislators for approval of the new Manufacturing Engineering and Robotics program.**

**This program is now a full-fledged program in the School of Engineering. In fact he continued expanding the program to include a graduate program in Manufacturing**

**Engineering, as well. This graduate program is now a full-fledged program under the directorship of Professor John Wood.**

**Director:** American Society of Mechanical Engineers, ASME, New Mexico Section  
(6/15/1985-8/30/1991)

**Chairman:** Professional Development, American Society of Mechanical Engineers, ASME, New Mexico Section,  
(1/15/1988-9/18/2001)

**Chairman:** Solid Mechanics & Materials Processing Graduate Program, Clarkson University, Potsdam, New York, USA  
(8/30/1982-8/12/1984)

**Co-Director:** Robotics & Manufacturing Center, Clarkson University, Potsdam, New York, USA  
(2/15/1982-8/12/1984)

**Professor:** Department of Mechanical & Industrial Engineering, Clarkson University, Potsdam, NY, USA  
(1/1/1979-8/12/1984)

**Council Member:** US Institute of Colloid and Surface Science, Potsdam, NY, USA  
(1/1/1983-1/1/1986)

**Visiting Principal Scientist:** The Technological Institute, Northwestern University, Evanston, Ill., USA  
(8/1/1978-1/1/1979)

**Associate Dean of Engineering:** College of Engineering, Shiraz University, Shiraz, Iran  
(8/1/1976-8/1/1978)

**Professor:** Department of Mechanical Engineering, Shiraz University, Shiraz, Iran  
(9/1/1976-1/1/1979)

**Principal Research Scientist:** Department of Mechanics & Materials Science, The John Hopkins University, Baltimore, MD, USA  
(6/1/1976-9/1/1976)

**Associate Professor:** Department of Mechanical Engineering, College of Engineering, Shiraz University, Shiraz, Iran  
(9/1/1972-9/1/1976)

**Visiting Associate Professor:** Department of Mechanics & Materials Science, The John Hopkins University, Baltimore, MD, USA  
(9/1/73-9/1/74)

**Chairman:** Department of Mechanical Engineering, Shiraz University, Shiraz, Iran  
(12/15/70-9/1/73)

**Assistant Professor:** Department of Mechanical Engineering, Shiraz University, Shiraz, Iran  
(8/1/70-9/1/72)

**Project Engineer:** De Laval Turbine, Inc., Nuclear Submarine Design Division, Trenton, NJ, USA  
(6/15/68-9/1/68)

**Research Fellow:** Department of Mechanical & Aerospace Engineering, University of Delaware, Newark, Del, USA (9/1/68-8/1/70) and (6/15/68-9/1/66)

**Teaching Assistant:** Department of Mechanical & Aerospace Engineering, University of Delaware, Newark, DE., USA (9/1/67-6/15/68)

## **2. Present and Previous Office Addresses and Phone Numbers:**

### **Present:**

1-Department of Mechanical Engineering, (<http://www.umaine.edu/MechEng/>), Room 219A, Boardman Hall, University of Maine, Orono, ME 04469, Tel: (207) 581 2143, Fax: (207) 581 2379, Mobile: (207) 356 5957

### **Previous:**

1-Department of Neurosurgery, (<http://hsc.unm.edu/som/neurosurgery/>), Room 2013C, UNM School of Medicine, UNM Hospital, Albuquerque, NM 87131, Tel: (505) 272 6363 or (505) 272 3401 (main Dept. Office), Fax: (505) 272 6091, Mobile: (505) 314 3627, Email: [moshahinpoor@salud.unm.edu](mailto:moshahinpoor@salud.unm.edu)

2-Artificial Muscle Research Institute (AMRI, [www.unm.edu/~amri](http://www.unm.edu/~amri)), Department of Mechanical Engineering, Room 230, University of New Mexico, Albuquerque, NM 87131; Tel: (505) 277-3966 or (505) 314 3627 (C), Fax: (505) 277-1571, Email: [shah@unm.edu](mailto:shah@unm.edu)

## **3. Present and Previous Home Addresses and Telephone Numbers:**

Present:

407 Kenduskeag Ave., Bangor, ME 04401  
Tel and Fax: (207) 945 5807, Mobile: (207) 356 5957

Previous:

1996-2007: 9910 Tanoan Drive, NE, Albuquerque, NM 87131,  
Tel and Fax: (505) 821-3096, Mobile: (505) 314 3627

## **4. Date of Birth and Citizenship**

September 14, 1943, US Citizen

## **5. Fields and Subfields of Education:**

Chemical and Materials Engineering, Mechanical & Aerospace Engineering, Bio Materials, Polymer Science and Engineering, Robotic Systems Engineering, Medical Engineering and Design, Cardiovascular, Endovascular and Neurosurgical Engineering.

## **6. Education: Listing the Last Attended Institutions First:**

### **Ph.D.: Mechanical and Aerospace Engineering,**

Department of Mechanical and Aerospace Engineering, School of Engineering, University of Delaware, Newark, Delaware, USA, Dates of Attendance: 9/1/68 to 6/30/70  
Principal Advisor: **H. Fletcher Brown Professor Jertzzy L. Nowinski**

**Ph.D. Dissertation Title: Free and Forced Large Amplitude Oscillations of Homogeneous and Nonhomogeneous Polymeric Hyperelastic Bodies**

### **M.Sc.: Mechanical and Aerospace Engineering,**

Department of Mechanical and Aerospace Engineering, School of Engineering, University of Delaware, Newark, Delaware, USA, Dates of Attendance: 9/1/66 to 6/15/68  
Principal Advisors: **Professors Millard F. Beatty and H. Fletcher Brown Professor Jertzzy L. Nowinski**

**Masters Thesis Title: Stability of an Elastic Circular Tube of Arbitrary Wall-Thickness Subjected to an External Dynamic Pressure**

### **B.Sc.: Chemical and Materials Engineering**

College of Engineering, Department of Chemical and Materials Engineering, Abadan Institute of Technology, Abadan, Iran, Dates of Attendance: 9/21/62 to 7/1/66

Principal Advisor: **Professor Ragden Babayan**

**Research Project: Visco-Elastic Properties of Polymers and Bio Materials**

## **7. Academic and Research-HONORS AND AWARDS :**

**Distinguished Member with Medallion**, Francis Crowe Society, December 2008, University of Maine

NASA 2003 “**Space Act Award**” for the Development of A Space Dust Wiper Made With Polymeric Artificial Muscles with Dr. Yoseph Bar-Cohen of JPL, October 31<sup>st</sup>., Von Karman Auditorium, NASA Jet Propulsion Laboratories, Awarded by Dr. Charles Elachi.

Elected "**Fellow of Institute of Physics**", by President Sir Peter Williams (Fellow of the Royal Society), Great Britain, (2001)

University of New Mexico Libraries “**Faculty Achievement Award**”, (1996)

Elected: **Member of the New York Academy of Sciences**, October (1995)

Received the College of Engineering "**Research Excellence Award**" for the second time, University of New Mexico, May (1995)

**Award For Excellence In Research**, Sandia National Laboratories, Twice in 1993 and 1994.

Awarded by the US Society of Professional Engineers, New Mexico Section, the title "**Engineer of the Year 1992**".

**New York Times 1991 Selected Inventor : The "Magic Wheel"**, US Patent No. **5,038,532**, Issued August 13, (1991), August 17, (1991)

**Award For Excellence In Manufacturing Engineering Education**, Society of Manufacturing Engineers, April, 1991

**Albuquerque Journal's 1991 selected "Rising Stars of the 90's"**

Awarded by the Board of Regents of the University of New Mexico, the title of Chaired "**Regents Professor for Life**", (1990)

Elected "**Fellow of ASME**" by the Board of Governors of the American Society of Mechanical Engineers, (1989)

Awarded the "**Halliburton Endowed Chair Professorship in CAD/CAM, CIM & Robotics**", in the School of Engineering, University of New Mexico, August (1988)

Received the College of Engineering "**Research Excellence Award**", University of New Mexico, May (1988)

Awarded the University of New Mexico's Burlington Northern Foundation "**Faculty Achievement Award for Excellence in Teaching and Research**", May (1986).

**Award of Achievement** by the U.S. Society of Technical Communications, for the Creation in 1984 of the World's First Multi-Station Robotics Instructional Laboratory at UNM, April (1986), USA.

Elected: **Member of the Sigma Xi Scientific Research Society**, (March 1985).

Awarded "**Eminent Engineer**" title by the **U.S. National Engineering Honor Society**; November 1983, USA

**First Prize: International Union of Theoretical & Applied Mechanics (IUTAM)-Applied Mechanics Reviews International Jumping Disk Contest**, Toronto, Canada; August 1980

**Engineering Researcher of the Year 1977** Award, selected jointly by the "Academy of Sciences of Iran" and "Ministry of Science and Higher Education of Iran", awarded by Her Majesty the Queen Farah of Iran, Tehran, Iran; 10/9/77

Alborz Foundation "**Distinguished Scientist of the Year 1976**" Award, Tehran, Iran; 2/7/77

**4<sup>th</sup>. Place Honor** (amongst over 110,000 high school graduate student applicants), National Universities Annual Admissions Contest, Tehran, Iran (1962)

## **8- Media Coverage and Recognition:**

Has been featured in connection with ionic polymeric "Artificial Muscles" and specially the dawn of "Bionic Eyes" in the World, BBC (British Broadcasting Corporation) programs, US NBC, ABC/Peter Jennings World News, CBS (Channel 13), Discovery Channel, KNME, German Public TV, Italian Public TV, Scientific American, Albuquerque Journal, The Albuquerque Tribune, New Mexico Business Weekly (September 2004, March 2005, June 2005), Inc. Magazine (April 2005), KNME TV, CBS (Channel 13), Discovery Channel (Next Step and Beyond 2000) as well as NBC Dateline Discovery and ABC (Channel 7), The Italian National TV, MIT Technology Review, Popular Mechanics, Discovery Magazine, London Sunday Times, Los Angeles Times, Dallas Times, BBC World News (March 2002, Bionic Eyes), New Scientists (April 2002, Bionic Eyes), Popular Science (July 2002, Bionic Eyes), Wired Magazine (March, 2004), many American, European, Canadians and South American (Brazil, Argentina, Columbia, Mexico) Magazines, etc. The September 2005 Issue of Popular Science featured an article on the Future of Human Body and Dr. Shahinpoor's arm wrestling robots and the ionic polymeric artificial muscles in 2004, 2005 and 2006, please see "[NASA Jet Propulsion Laboratories Robotic Arm Wrestling Competition Website](#)".

## **9. College and Departmental Academic Services:**

**Director:** Robotic Surgery Laboratory, College of Engineering, University of Maine, (2007-continuing)

**Co-Chair (with Professor M. Musavi, Professor and Chair of ECE Dept.) :** Robot Engineering Minor Program, College of Engineering, University of Maine, (2007-continuing)

**Chair:** Biomedical Engineering Minor Program, College of Engineering, University of Maine, (2007-continuing)

**Director:** Biomedical Engineering/Advanced Robotics (BEAR) laboratories, College of Engineering, University of Maine, (2007-continuing)

**Chairman:** Oversight Committee, Small Animal Research Facility (SARF), College of Engineering, University of Maine, (2007- continuing)

**Member:** University Research Council, University of Maine, (2007-2010)

**Chairman:** Research Excellence Committee, School of Engineering, University of New Mexico, (1992, 1994, 1996)

**Chairman** and/or **Member:** Appointment, Promotion and Tenure Committee, Department of Mechanical Engineering, UNM, (1994-1997, 1999-2002)

**Chairman** and/or **Member:** Faculty Search Committee, Department of Mechanical Engineering, UNM, (1988, 1996, 1999, 2001)

**Chairman:** Civil Engineering Chairman Search Committee, School of Engineering, UNM, (1998-1999)

**Chairman** and/or **Member:** Graduate Committee, Department of Mechanical Engineering, UNM, (1988, 1992, 1999, 2000)

**Chairman** and/or **Member:** Mechanical Engineering Chairman Search Committee, School of Engineering, UNM, (1988, 1993)

## **10. Non-Academic Services and Honors :**

**Judge, State of Maine VEX Robotics Championship, April 2010, Portland, Maine**

**Championship,** Generics Soccer Team, Albuquerque Soccer League, Albuquerque, New Mexico, (1986), was **assistant coach.**

**Championship,** Potsdam Soccer Team, **Northern New York Soccer Tournament,** Potsdam, NY, (1982), played **center forward.**

**Championship,** Abadan Institute of Technology (AIT) Team, **Abadan Soccer Tournament,** Abadan, Iran, (1964 and 1966), played **left forward.**

**Second Place, 1967 State of Delaware Open Chess Championship,** Title and Award, Wilmington, Delaware; 7/18/67

**Champion, 1<sup>st</sup>. place: Abadan Chess Championship,** 1965; Abadan, Iran; Title and Award, 4/20/65

## **11. Research Funding History:**

**(Over \$14m of past research grants, details are available upon request)**

### **Current Research Grants:**

**“Real-time Wireless Shape Monitoring of Deployable/Inflatable Space Structures”, (co-PI), NASA Epscor Grant, September 2008 through August 2011, (\$1,543,000)**

**“Smart Materials and Artificial Muscles”, (PI), Office of VP for Research, UMaine, July 2007-June 2011, (\$325,000)**

**“Feel Sensor”, (co-PI), Maine Technology Institute (MTI) Seed Grant, (\$25,000), September 2009-July 2011**

**“Advanced Biomechanics Laboratory for Injury Reduction and Rehabilitation”, (co-PI), Maine Science and Technology Foundation, MTAF Program, (\$795,000), January 1, 2011-January 1, 2013**

### **Pending Research Proposals:**

**“Design and Development of a Novel Family of Programmable Smart Electromagnetically Active Robotic Nanocomposites”, (PI), NASA EPSCoR Grant, (\$1,127,434)**

**“Development of a Specialized Fiber Composite Placement Head for A Gantry Robotic System”, (co-PI), NSF-MRI proposal, (\$1,428,581)**

**“Acquisition of Equipment for Advanced Robotics Manipulation Platform”, (co-PI), NSF MRI proposal, (\$397,000)**

**“Building Deep-water Floating Offshore Wind Research Capacity in Maine”, (co-PI), DOE-EPSCoR proposal, (\$6,000,000)**

### **The past research grants have been provided by the following institutions:**

**Maine Technology Institute  
NASA/Maine Space Grant Consortium  
University of Maine, Office of VP for Research, Maine Economic Incentive Fund  
Ophthalmotronics Corporation  
NIH/National Cancer Institute/Department of Health & Human Services  
NASA/NIAC through OAI-ERI,  
NASA Langley Research Center through SAIC  
NASA Johnson Space Center  
Johnson & Johnson DePuy Acromed  
Sandia National Laboratories  
Air Force Research Laboratory  
National Science Foundation  
MIT/Draper Laboratory**

Naval Research Laboratory  
NASA-Jet Propulsion Laboratory  
Artificial Muscles Research Institute  
Department of Energy/Science & Technology Alliance  
Waste Education and Research Consortium (WERC)  
Air Force Office of Scientific Research (AFOSR) via JIMT  
Sikorsky Helicopter Company  
Army Research Office  
Western Regional Power Association  
Environmental Protection Agency via AIPC-Pueblo Office of Environmental Protection  
Los Alamos National Laboratory  
Defense Nuclear Agency(DNA) via University of Texas at Arlington(UTA)  
Bell and Howell Equipment Grant  
INTEL Corporation Equipment Grant  
Southeastern Center for Electrical Engineering Education (SCEEE)  
T & W Systems Inc., Equipment and Software Grant  
IBM, Equipment Grant, IBM 7535 Advanced Manufacturing System  
General Electric Company  
The Augsbury Corporation  
CCT Division of Research  
Unesco-IOC

## **12. Laboratories Established (most recent ones listed first)**

Helping currently to establish with Professor Vincent Caccese University of Maine's and State of Maine's first "**Advanced Biomechanics Laboratory for Injury Reduction and Rehabilitation**" with funding from Maine Science and Technology Foundation, MTAFF Program, (2011)

Helped to Establish, for Professor Ashish Deshpande, University of Maine's and State of Maine's first "**Rehabilitation, Neuromuscular and Biorobotics (ReNeu) Laboratory**", with funding from NSF and Office of VP for Research, (2010)

Helped to Establish, for Professor Senthil Vel, University of Maine's and State of Maine's first "**Controls and Mechatronics Laboratory**" with funding from NSF and NASA, (2009)

Helped to Establish, for Professor Ali Sarvestani, University of Maine's and State of Maine's first "**Cell Mechanics and Tissue Manufacturing Laboratory**: with Funding from the Office of VP for Research, UMaine in (2009).

Established, along with Professors Ali Abedi (ECE dept.) , Vince Caccese, and Mauricio deCunha (ECE), University of Maine's and State of Maine's first "**Lunar Habitat/Wireless Sensing Laboratory**" in January 2011, with funding from NASA

**EPSCoR Grant:** “Wireless Dynamic Monitoring of Deployable Space Structures awarded August 2008.

Established University of Maine’s and State of Maine’s first “**Smart Materials and Artificial Muscles Laboratory**” with seed funding from University of Maine office of Vice-President for Research and Maine Economic Incentive Funds (MEIF), (2009).

Established University of Maine’s and State of Maine’s first “**Biomedical Engineering Laboratory**” with seed funding from University of Maine office of Vice-President for Research and Maine Economic Incentive Funds (MEIF), (2009).

Established University of Maine’s first “**Intelligent Robotics**” as well as “**Surgical Robotic Systems**” laboratories with seed funding from University of Maine office of Vice-President for Research and Maine Economic Incentive Funds (MEIF), (2009).

Established with funding from Neurological Surgery Department and the School of Medicine of the University of New Mexico during the year 1998 World's first "**Spine Biomechatronics Laboratory**". First attempt to electronically regenerate severed spinal cord was conducted in this laboratory in September of 2000. Made advances in spine fusion and stabilization systems design and implementation.

Established with funding from Sandia National Laboratories and University of New Mexico Office of the Associate Provost for Research the **Artificial Muscles Research Institute (AMRI)** during the year 1996 in the School of Engineering and the School of Medicine, University of New Mexico. World's first membrane-encapsulated artificial muscles made from ionic polymeric gels were first fabricated in the “**Artificial Muscle Research Laboratory**”, (**AMRL**), which was established prior to the establishment of the **Artificial Muscles Research Institute (AMRI)** laboratory in 1993.

Established with funding from Sandia National Laboratories and US Army Research Office (ARO) a “**Smart Materials, Structures and Systems Laboratory**” during the year 1992 in the College of Engineering, University of New Mexico. World's first membrane-encapsulated artificial muscles made from ionic polymeric gels were first fabricated in this laboratory in 1993.

Established (with professors Fred Ju and Joe Mullins of the ME Dept.) with funding from IBM CIM Alliance the first “**Computer Integrated Manufacturing (CIM) Laboratory**” at UNM with RT work stations, 386 computers, CNC machines , ASA400 networking, IBM CAD and auxiliary units during the 1990-1991 academic year.

Established with external (Sandia National Laboratories) and internal departmental funds a multi-station "**Solid Modeling**" Laboratory with PADL-2 software, Tektronix 4105 and 4106 terminals and Tektronix 4895 color plotters and Mitsubishi high resolution color graphics terminal during the 1986-87 academic year.

Established with UNM bond money a CADAM-based “**CAD/CAM Laboratory**” in the College of Engineering, at the University of New Mexico with 8 independent stations and the associated CNC tables, computers, plotters, digitizers, mice, and printers during the period 1985-1986.

Established with UNM bond money the first (in the state of New Mexico) fully operational “**Robotic Instructional Laboratory**” in the ME Department at the University of New Mexico with 14 independent robot work stations each with a 5-axis robot, a computer, a 10-axis controller, a conveyer belt and a coordinated table during the period 1984-1985. Added an IBM-7535 Advanced Manufacturing System Robotic Cell, a Maker-100 United States Robotic Cell, a Lobot-1, 6-axis robot with voice and vision and a mobile robot in the period 1985-86.

Established (with Professor Doug Smith of Chemical and Nuclear Engineering Dept.) as a Co-Director, the first UNM “**Powder and Granular Materials Laboratory**” jointly run by the Mechanical Engineering and the Chemical and Nuclear Engineering Departments during the period 1984 - 1985.

Established (as team member with Professors R. Schilling and R. Mukundan of ECE Dept.) with internal and external funds (Westinghouse, GE, IBM) a fully operational “**Robotics Research and Demonstration Laboratory**” with two IBM 7565 (White Cloud) Rectangular Robots, one GE P50 large 6-axis industrial robot, two liberator cylindrical Robots (Robotics, Inc.), one Optomation II robotic vision system (GE), and one series I microcomputer (IBM) and AML (Advanced Manufacturing Language) Software in the period 1982-1984.

Established with external and internal funds two fully operational “**Instructional Robotics and Control Laboratories**” at Clarkson University with 10 Educational 5-axis robots and the associated robotic work cells, and 2 mobile personal robots during the period 1981-1984.

Established with external funds (NSF) a “**Granular Materials Research Laboratory**” in the Mechanical and Industrial Engineering Department at Clarkson University during the Period 1980 - 1983.

Established with internal funds (Shiraz University Faculty Research Funds) a “**Hovercraft Design and Fabrication Laboratory**”, in the Mechanical Engineering Department at Shiraz University, Shiraz, Iran during the Period 1976-1978.

### **13. Recent Activities In Conferences, Congresses and Professional Societies (listing the most recent ones first)**

**General Chairman:** 6<sup>th</sup>. International Congress on Biomimetics, Artificial Muscles and Nano-Bio (Nano-Bio 2009), <http://biomimetics2011.u-cergy.fr/>, Cergy-Pontoise, Paris, France. October 25-27, 2011

**Member: Program Committee**, 16th US National Congress of Theoretical and Applied Mechanics (<http://www.conferencetoolbox.org/USNCTAM2010/Organizers.cfm>)  
State College, PA, June 27-July 2, 2010

**Symposium Chair, Electromechanics of Ionic Polymer Metal Composites (IPMCs)**,  
16th US National Congress of Theoretical and Applied Mechanics  
(<http://www.conferencetoolbox.org/USNCTAM2010/Organizers.cfm>)  
State College, PA, June 27-July 2, 2010

**Invited Speaker:** Mohsen Shahinpoor, “Artificial Muscles”, (invited), American Society for Artificial Internal Organs (ASAIO), 56th. Annual Conference, <http://www.asaio.com/>, May 27-29, Baltimore, Md., CD ROM Proceedings, 2010

**Session Chair:** 4th. International Conference on Artificial Muscles, and the 5<sup>th</sup>. International Congress on Biomimetics, Artificial Muscles and Nano-Bio (Nano-Bio 2009), [http://unit.aist.go.jp/rice/events/cam4/english/index\\_e.html](http://unit.aist.go.jp/rice/events/cam4/english/index_e.html), Seri Life Science Center, Osaka, Japan, November 25-28, (2009)

**General Chairman:** 5<sup>th</sup>. International Congress on Biomimetics, Artificial Muscles and Nano-Bio (Nano-Bio 2009), <http://www.world-congress.net/>, Seri Life Science Center, Osaka, Japan, November 25-28, (2009)

**General Chairman with Professor Toribio Fernández Otero:** Fourth World Congress on Biomimetics, Artificial Muscles and Nano-Bio (Biomimetics and Nano-Bio 2007, [www.world-congress.net](http://www.world-congress.net), [www.upct.es/~nano-bio/pagina\\_nueva\\_1.htm](http://www.upct.es/~nano-bio/pagina_nueva_1.htm), Universidad Politécnica de Cartagena, Cartagena, Spain , Europe, Nov 6-7-8, 2007

**Chairman:** Membership and Marketing Committee, New Mexico Biotechnology and Biomedical Association (NMBBA), Albuquerque and Santa Fe, NM (2004-2006)

**Member of the Board of Directors:** New Mexico Biotechnology and Biomedical Association (NMBBA), Albuquerque and Santa Fe, NM (2004-2006)

**General Chairman with Dr. Piergeorgio Tozzi, MD and Noble Laureate Professor Pierre Gilles De Gennes:** Third World Congress on Biomimetics, Artificial Muscles and Nano-Bio (Biomimetics and Nano-Bio 2006, [www.world-congress.net](http://www.world-congress.net)), May 25-27 (2006), Lausanne, Switzerland

**General Chairman with Noble Laureate Professor Pierre Gilles De Gennes:** Second World Congress on Biomimetics and Artificial Muscles (Biomimetics and Nano-Bio 2004, [www.world-congress.net](http://www.world-congress.net)), December 5-8, (2004), Albuquerque, NM, USA

**Member:** NM Biotechnology & Biomedical Association (NMBBA), New Mexico, USA (2002)

**Member:** Biomaterials Network, USA (2002)

**General Co-Chairman** with Noble Laureate **Professor Pierre Gilles De Gennes**: First World Congress on Biomimetics and Artificial Muscles (Biomimetic 2002, [www.world-congress.net](http://www.world-congress.net)), December 9-11, (2002), Albuquerque Convention center, Albuquerque, New Mexico, USA

**Fellow**: Institute of Physics, IOP, London, England, (2001)

**Member of the Electroactive Polymer Actuators and Devices Program Committee**, SPIE 1997-2007 North American Congress on Smart Structures and Materials, San Diego, California, March (1997-Present)

**Member of the International Program Committee**, 1997 IEEE Robotics & Automation Conference, (1997)

**Member**: New York Academy of Sciences (1997-Present)

**Member of the Smart Materials Program Committee**, SPIE 1997 North American Congress on Smart Structures and Materials, San Diego, California, February (1997-2002)

**Session Chair**, Smart Materials, SPIE (1997) North American Congress on Smart Structures and Materials, San Diego, California, February (1997)

**Member of the International Advisory Board of the 4<sup>th</sup>. International Conference on Intelligent Materials**, ICIM'97 June (1997), Tokyo, Japan

**Licensed Professional Engineer** (New Mexico State), License No. 9353 and (New York State), License No. 58845, (1984-Present)

**Program Chair**: National Science Foundation's 1996 Design and Manufacturing Grantees Conference, January 1996

**Member**: US National Committee on Vibrations and Noise, (1994-1996)

**Member**: Smart Materials Program Committee, SPIE 1996 North American Congress on Smart Structures and Materials, San Diego, California, February (1996)

**Session Chair**, Smart Materials, SPIE 1996 North American Congress on Smart Structures and Materials, San Diego, California, February (1996)

**Member**: International Advisory Board of the 3rd. International Conference on Intelligent Materials, ICIM'96 and 3rd. European Conference on Smart Structures and Materials, June 3-5, (1996), Lyon, France

**Chairman:** Technical Program Committee, Fourth International Congress on Environmentally Conscious Design and Manufacturing, July 23-25 ,Cleveland, Ohio, (1996)

**Chairman:** Technical Program Committee, Fourth International Congress on Environmentally Conscious Design and Manufacturing, July 23-25 ,Cleveland, Ohio, (1996)

**Member of the National Science Foundation Panel:** Design & Manufacturing (1995-Present)

**Co-Chairman:** The Technical Program Committee of the Second Sandia-UNM-ASME Agile Manufacturing Conference on Virtual Manufacturing, March 1995, Albuquerque, New Mexico

**Member:** The Smart Materials Program Committee, SPIE 1995 North American Congress on Smart Structures and Materials, San Diego, California, February-March (1995)

**Member:** American Institute of Aeronautics and Astronautics, AIAA (1994)

**Symposium Chair:** Smart Materials, SPIE 1995 North American Congress on Smart Structures and Materials, San Diego, California, February-March (1995)

**Co-Chairman:** Second International Congress on Environmentally Conscious Manufacturing, August 29-September 3, Arlington, Virginia, (1993)

**Co-Chairman:** The Technical Program Committee of the First Sandia-UNM-ASME Agile Manufacturing Conference on Rapid Prototyping, October 1993, Albuquerque, New Mexico.

**Member:** The Smart Materials Program Committee, SPIE 1993 North American Congress on Smart Structures and Materials, Albuquerque, New Mexico, February (1993)

**Symposium Chair:** Smart Materials, SPIE 1993 North American Congress on Smart Structures and Materials, Albuquerque, New Mexico, February (1993)

**Member:** US National Stirring Committee, 14th. Biennial ASME Vibrations Conference, Albuquerque, NM, September (1993)

**Cluster Chair:** Vibrations and Dynamics of Flexible Robot Manipulators, the 14th. Biennial ASME Vibrations Conference, Albuquerque, NM, September (1993)

**Cluster Chair:** Smart Materials and Structures, the 14th. Biennial ASME Vibrations Conference, Albuquerque, NM, September (1993)

**Co-Chairman:** Local Program Committee and Member of the International Program Committee of International Symposium of Robotics and Manufacturing : Recent Trends in Research, Education and Applications, October, (1992), Santa Fe, New Mexico

**Member:** The Smart Materials Program Committee of The First International Congress on Smart Materials and Structures, Alexandria, Virginia, November, (1992)

**Co-Chairman:** First International Congress on Environmentally Conscious Manufacturing, September 17-20, Santa Fe New Mexico, (1991)

**Co-Chairman:** 27th. Annual Conference of Society of Engineering Science, October 21-26, (1990), Santa Fe, New Mexico

**Chairman & Session Organizer:** Reactive Particle Systems, 20th. FPS Powder Science & Technology International Symposium, Boston, MA, August (1989)

**Co-Chairman:** 27th. ASME National Symposium on " Hazardous Waste-Impact Mitigation Through Innovative Technology, Albuquerque, New Mexico, May (1989)

**Member:** International Program Committee, Second International Symposium on "Robotics and Manufacturing," Albuquerque, NM, November (1988)

**Chairman and Session Organizer:** Reactive Particles, 19th. FPS Powder Science and Technology Symposium, Santa Clara, Cal., July (1988)

**Program Chairman:** 26th ASME Symposium on "New Trends In Automated Manufacturing," Albuquerque, NM, May (1987)

**Session Organizer and Chairman:** IEEE-ISE International Symposium, Albuquerque, NM, May (1987)

**Session Chairman:** IASTED International Symposium on Robotics and Automation, Santa Barbara, CA, May (1987)

**Co-Chairman:** The National Program Committee and member of the International Program Committee of International Symposium of Robotics: Modeling, Control, and Education, Nov. (1986), Albuquerque, N.M.

**Program Chairman:** ASME National Symposium on "Intelligent Machines and Robotics", Albuquerque, NM, May (1986).

**Session Chairman:** Robot Engineering Education, ASME National Symposium on "Intelligent Machines and Robotics", Albuquerque, NM, May (1986).

**Session Co-Chairman:** Pore Characterization of Powders and Granular Materials, Fine Powder Society's Annual Conference, San Francisco, Calif., July (1986).

**Member:** International Pyrotechnics Society, (1986), USA

**Fellow:** American Society of Mechanical Engineers, (1986), ASME

**Member:** Tau Beta Pi, Engineering Honor Society, (1986), (USA)

**Member:** Sigma Xi, The Scientific Research Society, (1986), (USA)

**Director:** ASME, New Mexico Section, (1985-1992)

**Site Proctor:** IEEE National Video Conference, "Robot Dynamics and Control", Albuquerque, NM, February (1985).

**Senior Member:** Society of Manufacturing Engineers, (1985), USA

**Member:** Industrial Mathematics Society, (1985), USA

**Member:** New Mexico Academy of Sciences, Santa Fe, NM, (1984)

**Member:** American Society for the Advancement of Science, (1984), USA

**Member:** U.S. Institute of Colloid & Surface Sciences, (1982), USA

**Member:** The American Academy of Mechanics, (1982), USA

**Member:** U.S. National Society of Professional Engineers (NSPE) New Mexico Section and New York Section, (1982), USA

**Member:** International Fine Particle Society, (1981), USA

**Member:** The Society of Engineering Science, (1981), USA

**Member:** Society for Natural Philosophy, (1974), USA

## **14. Journal Editorial Experience:**

**Member of the Editorial Board:** *Advances in Materials Research, An International Journal*, Techno Press (Inaugural issue to come out in 2012)

**Editor with Professor Dr. Hans-Jörg Schneider, "Smart Materials Book Series",** Royal Society of Chemistry Publishers, Dr. Leanne Marle MRSC, Commissioning Editor, RSC Publishing, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, UK (2011)

**Guest Co-Editor with Dr. Kinji Asaka of AIST, Japan and Professor Norm Wereley of Univ. of Maryland:** *Journal of Smart Materials and Structures*, Special; Issue on Artificial Muscles, to be published in 2011.

**Associate Editor: Recent Patents In Biomedical Engineering International Journal**, Bentham Science Publishers Ltd., Oak Park, IL 60301-0446, USA, 2009-continuing

**Member:** Editorial Advisory Board, **International Journal of Smart Structures and Materials**, IOP press, England, since 1992

**Series Editor :** Springer-Verlag Series on **High Pressure Shock Compression of Solids**", Springer Publishing Company, Since 1992

**Founding Editor and Editor-in-Chief :** International Journal of Environmentally Conscious Design & Manufacturing, ECM Press, Albuquerque, New Mexico, 1990, **NOW CHANGED TO** International Journal of Environmentally Intelligent Design and Manufacturing ([www.IJECDM.com](http://www.IJECDM.com)).

**Member:** Editorial Advisory Board, **Int. J. Bulk Solids Handling**, 1981-1994

**Member:** Editorial Advisory Board, **Int. J. Storing, Handling and Transportation of Bulk**, 1994-present

**Member:** Editorial Advisory Board, "International Journal of Modeling & Scientific Computing", 1992-2001

**Member:** Editorial Advisory Board, **Journal of Intelligent & Fuzzy Systems**, John Wiley, 1992-1998

**Member:** Editorial Advisory Board, **International J. Sci. Tech.**, 1985

**Member:** Editorial Advisory Board, **Int. J. Powder Handling & Processing**, 1988

**Member:** Editorial Advisory Board, **Scientia Iranica**, 1993

**Editor-in-Chief: Iranian. J. Sci. Tech.**, vol.4-vol.7, Pergamon Press, Oxford, England; period: 9/1/74 - 9/1/80

## **15. Inventions and Patents:**

### **(listing the most recent ones first)**

57-"Synthetic Muscle-Based Multi-Powered Contact Lens", *US Patent Office*, **Patent No. 7,850,951**, Issued December 14, 2010

56-"Membrane and Catalyst Composite for Membrane Electrode Assembly", *US Patent Office*, Patent Pending, University of Maine, **Serial No. 61/177,445**, PCT/US2010/034527, May 12, 2010

55-"Surgical Correction of Ptosis by Polymeric Artificial Muscles", *US Patent Office*, **Patent Application No. 20100042146A1**, February 18, 2010

54-"Inflatable Wind Turbine Fabric Air Blades", *US Patent Office*, Patent Pending, University of Maine, **Serial No. 61/237485**, August 2009

53-"Surgical Correction of Ptosis by Polymeric Artificial Muscles", *US Patent Office*, **Patent No. 7,625,404**, Issued December 1, 2009

52-"Method of Fabricating a Dry Electro-Active Polymeric Synthetic Muscle", *US Patent Office*, **Patent No. 7, 276, 090**, Issued October 2, 2007

51-"Shape Memory Alloy Temperature Sensor and Switch", *US Patent Office*, Patent No. **7, 220, 051**, Issued May 22, 2007

50-"System and Device For Correcting Hyperopia and Presbyopia", *US Patent Office*, Patent Pending, Application Number **11/626,774** , Submitted 1/24/2007

49-"Electrically-Controllable Multi-Fingered Resilient Heart Compression Devices", CIP to US Patent No. Number **6,464,655**, *US Patent Office*, Patent No.**7,198,594**, Issued April 3, (2007)

48-"Surgical Correction of Human Eye Refractive Errors By Active Composite Artificial Muscle Implants", *US Patent Office*, Patent No. **7,090,696**, CIP to US Patent No. **6,511,508B1**, Issued August 15, 2006

47-" Wire Equipped with Electrically Bendable Distal Tip Made with Artificial Muscle", *US Patent Office*, Provisional Patent Pending, Provisional Application Number **60005205**, submitted 11/10/2006

46-"Synthetic Muscle-Based Multi-Powered Active Contact Lens", *US Patent Office*, Serial No. **11/358,530**, February (2006), Published Application

45-"Accommodating Zonular Mini-Bridge Implants", *US Patent Office*, United States Patent Number **7,060,09**, Issued June 13, 2006

44-"Shape Memory Alloy Temperature Sensor-2: CIP", *US Patent Office*, United State Patent No. **6,837,620**, Issued January 4, 2005

43-"Bioelectric Sensor and Switch System For Medical Imaging", *US patent Office*, United States Patent No. **6,829,499**, Issued December 7, 2004

42-"Synthetic Muscle-Based Diaphragm Pump Apparatuses", *US Patent Office*, United States Patent No. **6,682,500**, Issued January 27, 2004

41-"Disk Drive Optical Switch", *US Patent Office*, United State Patent No. **6,678,434**, Issued January 13, 2004.

40-"Shape Memory Alloy Temperature Sensor", *US Patent Office*, United State Patent No. **6,612,739**, Issued September 2, 2003

39-"Implantable Micro-Pump Assembly," , *US Patent Office No. 6,589,198*, Issued July 8, 2003.

38-"Surgical Correction of Human Eye Refractive Errors By Active Composite Artificial Muscle Implants“, *US Patent Office*, No. **6,511,508** Issued January 28, 2003, also PCT Application No. **2323-00-PCT** filed July (2001)

37-"Ionic Polymer Sensors and Actuators", *US Patent Office*, No. **6,475,639**, Issued November 5, 2002.

36-"Electrically-Controllable Multi-Fingered Resilient Heart Compression Devices”, *US Patent Office*, Number **6,464,655**, Issued October 15, (2002)

35-"Smart Fiber Optic Magnetometer", *US Patent Office*, Number **6,433,543**, Issued , August 13, (2002)

34-"Metal Hydride Artificial Muscles," , *US Patent Office*, United State Patent **6,405,532**, Issued June 18, (2002)

33-"Dynamic Multi-Channel Fiber Optic Switch", *US Patent Office*, United State Patent, **6,381,382**, Issued April 30, (2002)

32-"Dynamic Fiber Optic Switch with Artificial Muscles", *US Patent Office*, United States Patent **6,192,171**, Issued February 20, (2001)

31-"Dynamic Fiber Optic Switch", *US Patent Office*, United States Patent **6,181,844**, Issued January 30, (2001)

30-"Soft Actuators and Artificial Muscles" , *US Patent Office*, United States Patent **6,109,852**, Issued August 29, (2000)

29-"Fibrous, Parallel Spring-Loaded Shape-Memory Alloy (SMA) Robotic Linear Actuators", *US Patent Office*, United States Patent **5,821,664**, Issued October 13, (1998)

28-"Shape Memory Alloy Thaw Sensors", *US Patent Office*, US Patent Number **5,735,607**, issued April 7, (1998)

27-"Omni-Directional Electromagnetic Rail Launchers", *US Patent Office*, US Patent No. **5,435,225**, Issued July 25, (1995)

26-"Spring-Loaded Ionic Polymeric Gel Linear Actuator", *US Patent Office*, US Patent No. **5,389,222**, Issued February 14, (1995)

25-"Hybrid Armature Projectile", *US Patent Office*, US Patent No. **5,191,164**, Issued March 2, (1993)

24-"Electrically Controlled Polymeric Gel Actuators", (world's first patent on synthetic artificial muscles), *US Patent Office*, US Patent No. **5,250,167**, Issued October, 5, (1993)

23-"Robotic Apparatus", *US Patent Office*, US Patent No. **5,114,300**, Issued May 19, (1992)

22-"Deployable Spatial Structure", *US Patent Office*, United States Patent **5,038,532**, Issued August 13, (1991), "The Magic Wheel", New York Times selected Invention of 1991, August 17, (1991)

21-"Bio-Potential Activation of Artificial Muscles", *US Patent and Trademark Office*, *Application No. 10/605,676*, October 2003, Published Application

20-"Heat-Shrink Scleral Band With Custom-Made Buckle For Retinal Detachment Surgery", Patent Pending, US Patent and Trademark Office Application Number **10/707662**, **EFS ID No. 52983**, Submitted December 30, 2003, Published Application

19-"Disc Drive Optical Switch with Multiple Transition Channels", *US Patent Office*, June 2001, **CIP on Serial No. 09/626,342**, Published Application (2001)

18-"Accommodating Zonular Mini-Bridges", *US Patent Office*, Serial Number **09/759,766**, January, (2002), Patent Allowed 2/15/2006, Published Application

17-"Solid State Polymeric Sensors, Transducers and Actuators", *US Patent Office*, Serial No. **09/217,210**, July (2001), Published application, Patent changed name.

16-"Nitric Oxide(NO) Donor+cGMP-PDE5 Inhibitor As A Topical Drug For Glaucoma", *US Patent Office*, Application No. **10/064,627**, July 31<sup>st</sup>., (2002), Published Application

15-"Nitric Oxide(NO) Donor+cGMP-PDE5 Inhibitor As A Topical Drug For Enhanced Hair Growth", *US Patent Office*, Application No. **10/064,698**, August 7, (2002), Published Application

14-"Novel Electrically Active Ionic Polymer Metal Composites and Novel Methods of Manufacturing Them", *US Patent Office*, Application No. **10/064,729**, August 9, (2002), Published Application

13-"Surgical Correction of Human Eye Refractive Errors By Active Composite Artificial Muscle Implants", *US Patent Office*, Serial No. **09/633,023**, CIP Application submitted (December 2002), continuation and expansion of claims of the US Patent No. **6,511,508B1**, Patent Allowed 11/28/2005, Published Application.

12-"Anti-Snoring Apparatus and Method", *US Patent Office*, Serial No. **10/872,181**, June (2004), Published Application

11-"Shape Memory Alloy Temperature Sensor and Switch", *US Patent Office*, Serial No. **11/023,874**, December (2004), Published Application

10-"Human Lower Limb Performance Enhancement Outfit", *US Patent Office*, Serial No. **11/115,731**, April (2005), Published Application

9-"Human Lower Limb Performance Enhancement Outfit Systems", *US Patent Office*, Serial No. **11/180,349**, July (2005), Published Application

8-"Backpack Support Apparatus", *US Patent Office*, Serial No. **11/180,356**, July (2005), Published Application

7-"Surgical Correction of Ptosis By Polymeric Artificial Muscles", *US Patent Office*, Serial No. **11/318,665**, December (2005), Published Application

6-"Synthetic Muscle-Based Multi-Powered Active Contact Lens", *US Patent Office*, Serial No. **11/358,530**, February (2006), Published Application

5-"Inertial Solar Engine", Iran Patent Office, No. **16615/54- II-5**, Tehran, Iran (1977)

4-"Network of Oscillating Jets for Passive Irrigation", Iran Patent Office, No. **13854/54-8-27**, Tehran, Iran (1976)

3-"Liquid Crystal Writing Board", Iran, Patent Office, No. **13853/54-8-27**, Tehran, Iran (1976)

2-"Pistachio-Sorting Machine", Iran Patent Office, No. **13197/53-3-29**, Tehran, Iran (1975)

1-"Cholesteric Liquid Crystal Chromo-Pressure Gauge", U.S.-Int. Inv. Inc., No. A-316-747, Iran Patent Office, No. **12393/53-8-29**, Tehran, Iran (1975)

## **16. Teaching Experience:**

**(U=undergraduate; G=graduate; UL=under-graduate laboratory; GL=graduate laboratory), most frequently taught first**

### **Recently taught courses:**

In the current Spring 2011 semester he teaches the Robot Dynamics and Control MEE 444 to seniors and Advanced Vibrations MEE 573 to graduate students. In the Fall 2010 Semester he taught Robot Dynamics and Control MEE 444 to seniors. In the Spring 2010 semester he taught the second Capstone Design Course MEE488 to graduating seniors, Robot Dynamics and Control, MEE444 to seniors, Smart Materials, MEE555, to graduate students as well as a directed study design Course on Inflatable Wind Turbines. He is also team teaching GEE298 Nanoscience and Nanoengineering course with Professor Rosemary Smith of Electrical and Computer Engineering department in connection with

Nanomechanics and Molecular Motors. In the Fall 2009 Semester at University of Maine he taught the First Senior Capstone Design (MEE487) course to Senior Students as well as team-teaching Introduction to Biomedical Engineering (INT 121) with Professor Rosemary Smith to Junior and Senior students. In the Spring 2009 semester at University of Maine he taught Smart Materials (MEE555) to Graduate Students as well as Selected Topics in Robotic Surgery (MEE697-01) to Graduate Students. He also team-taught Introduction to Biomedical Engineering (INT 121) with Professor Rosemary Smith to Junior and Senior students. In his Fall 2008 semester at University of Maine he taught Advanced Robot Kinematics, Dynamics and Control (MEE697-02) to Graduate Students and INT 421 (Selected Topics in Biomedical Engineering) to Senior Students. He also team-taught Introduction to Biomedical Engineering (INT 121) with Professor Rosemary Smith to Junior and Senior students. In the Spring 2008 semester at University of Maine he taught Mechanics of Composite Materials (MEE450). He also team-taught Introduction to Biomedical Engineering (INT 121) with Professor Rosemary Smith to Junior and Senior students. In his Fall 2007 semester at University of Maine he taught Smart Materials (MEE555) to Graduate Students as well as Systems Dynamics and Control (MEE370) to Junior and Senior students as well as optional Design II (MEE498) to senior students. He also team-taught Introduction to Biomedical Engineering (INT 121) with Professor Rosemary Smith to Junior and Senior students.

At University of New Mexico (UNM), in the Fall Semesters, he normally taught Robot Engineering I & II, ME 482/582 (4 credits) or Smart Materials & Structures, ME 562 (3 credits) to graduate students, Machine Component Design, ME358(3 credits) to seniors, or the capstone machine design course ME359 (4 credits) to graduating seniors and Computer-Aided Design and Manufacturing, CAD/CAM, ME484/584 (3 credits) to seniors and graduate students, as well as number of directed study courses such as Biotechnology, Biomechatronics, Design Intelligence or Smart Materials & Structures (ME 459, 559, 462, to selected undergrad or graduate students).

At UNM, in the Spring Semesters, he normally taught either Machine Component Design, ME358(3 credits) to seniors, or the capstone design course ME359 (4 credits) to graduating seniors and Computer-Aided Design and Manufacturing, CAD/CAM, ME484/584 (3 credits) to seniors and Graduate students, as well as number of directed study courses such as Biotechnology, Biomechatronics, Design Intelligence or Smart Materials & Structures (ME 459, 559, 462, to selected undergrad or graduate students).

**He can also teach any of the following courses with minimal preparation time in any semester:**

**Smart Materials (G, GL)**

**Nano Science and Nano Engineering (U, UL)**

**Biomedical Engineering (U, UL, G, GL)**

**Nanotechnology and Nano-Composites (U, UL, G, GL)**

**Mechanics of Composite Materials (U, UL, G, GL)**

**Dynamic Systems and Control (U, UL, G, GL)**

**Machine Component Design (U, UL)**

**Robot Engineering I and II, (U, G, UL, GL)**

**CAD/CAM (U, G, UL, GL)**

**Mechanics of Materials (U, G, UL, GL)**  
**Materials Science & Engineering (U, UL, G, GL)**  
**Smart Materials & Structures I & II, (U, G, UL, GL)**  
**Biomaterials, (G, GL)**  
**Biotechnology (G, GL)**  
**Mechatronics (G, GL)**  
**Fundamentals of Robotics (U, UL)**  
**Vibrations (U, UL, G, GL)**  
**Automatic Control & Instrumentation (U, UL)**  
**Systems Analysis & Design (G, GL)**  
**Manufacturing Processes, (U, UL)**  
**Continuum Mechanics (U, G)**  
**Design and Control of Industrial Robots (U, G, UL, GL)**  
**Engineering Elastic Stability (G)**  
**Engineering Mathematics (U, G)**  
**Factory Automation, CIM and FMS (G, GL)**  
**Gas Dynamics (U, UL)**  
**Statics & Dynamics (U, UL)**  
**Strength of Materials (U, UL)**  
**Thermodynamics (U, UL)**  
**Heat Transfer (U, UL)**  
**Theory of Elasticity (G)**  
**Theory of Machines & Mechanisms (U, UL, G)**  
**Theory of Plates & Theory of Shells (G, GL)**

**He proposed, developed and offered (With Professor Gerald May, Dean of Engineering at the time) the first UNM live Instructional TV course (Robot Engineering) in the State of New Mexico by means of a Grant from Sandia National Laboratories, Spring (1985), This Effort led to the installation of a microwave antenna on top of the Sandia Mountain Crest as well as the establishment of studios, hardware and software for the establishment of the ITV System in the State of New Mexico**

## **17. Masters Students and Theses: (Listing the most recent ones first)**

70 Siavash Gheshmi, “Design and Development of A Robotic Surgery System For Cataract Surgery”, Chair of Committee with Professors Senthil Vel, Department of Mechanical Engineering, and Professor and Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, M. Sci., December, 2011.

69 Yousif Mohamed, “Robotic Venus Flytrap made with Ionic polymer metal Composite Artificial Muscles”, Chair of Committee with Professors Senthil Vel, Department of Mechanical Engineering, and Professor and Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469,

M. Sci., December, 2011.

68 Scott Prince, "Application of Particle Swarm Optimization to Robotic Inverse Kinematics", Chair of Committee with Professors Senthil Vel, Department of Mechanical Engineering, and Professor and Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, M. Sci., May, 2010.

67 Ronnie Oliver, "Design & Development of A Stair Climbing Companion Robotic System", Chair of Committee with Professors Senthil Vel, Michael Boyle, Department of Mechanical Engineering, and Professor and Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, M. Sci., December 2010

66 Mehmet Ali Sen, "Proper Orthogonal Development Methodology To Understand Underlying Physics of Rough-wall Turbulent Boundary Layer", Co-Chair of Committee with Professor Kiran Bhaganagar, Department of Mechanical Engineering, The University of Maine, Orono, ME, 04469, M. Sci., December, 2007.

65 Ujwal Deole, "Artificial Muscle Microgrippers", Co-Chair of Committee with Professor Ron Lumia, Department of Mechanical Engineering, The University of New Mexico, Albuquerque, New Mexico, M. Sci., December, 2005.

64 Bryan Romero," Design of a Mini-Testing Machine for Characterization of Artificial Muscles", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 2001)

63 German Chamorro, "Swimming Robotic Structures Equipped with IPMC Artificial Muscles", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 2000)

62. Tariq Rashid, "Optimization of Artificial Muscles Manufacturing Process using Orthogonal Arrays and the Taguchi Method" Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1998)

61. Casildo Romero, "Mechanics of Crenulation in Nonlinear Materials", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (August 1998)

60. Mark Anderson, "Simultaneous PVDF/VISAR Measurement Technique For Isentropic Loading With Graded Density Impactors", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1998)

59. David Hickerson, "Modeling and Control of A Hybrid Manipulator", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1998)

58. Clint Hall, "Shock Hugoniot and Release States in Concrete Mixtures with Different Aggregate Sizes from 3 to 23 GPa", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1998)
57. Jeffrey Lantz, "Design of An Environmentally Conscious Fluorescent and Mercury Lamps", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1996)
56. Jim Arellanes, "Smart Structures with Embedded SMA's", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 96)
55. Guoping Wang, "Large Deflection Analysis of An Elastic Beam Structure Embedding A Shape Memory Alloy Wire Actuator", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1996)
54. Eric Steinmaus, "Fuzzy Control of A Drill Press", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1995)
53. Shijion Zhou, "Design of A Sip-and-Puff Switch For Environmental Control for Quadriplegics", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1995)
52. Anthony Tafoya, "Dynamic Flow System for High Flow Insufflation in Laproscopic Surgery", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1994)
51. Martin Bachicha, "Magnetically-Actuated, Direct-Drive Snake-Like Flexible Robotic Structures Design and Fabrication", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1994)
50. Alan Nehring, "Engineering Benchmarking", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (Co-chairman of M.Sc. Committee), M.Sc., (May 1994)
49. Daniel Archuleta, "Design of a Digital Controller for Electromagnetic Ball Levitator Systems", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (co-chair of M.Sc. committee), M.Sc., (May 1994)
48. Supriti Mukherjee, "Three-Dimensional Electroplating and Free-Form Fabrication", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (co-chair of M.Sc. committee) M.Sc., (May 1994)
47. Ali Daemi, "CAD/CAM Data Interfacing For Robotically-Assisted 3-D Rapid Prototyping", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1994)

46. Thomas Wilson, "Dynamic Modeling and Computer Simulation of A Two-Link Flexible Robot Manipulator", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (co-chair of M.Sc. committee), M.Sc., (May 1994)
45. Joseph Jablonski, "Strategic Planning and Implementing Total Quality Management In A DOD Environment", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (co-chair of M.Sc. Committee), M.Sc., (May 1993)
44. Timothy Chavez, "Robotically-Assisted Environmental Restoration and Waste Management", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1993)
43. Mehran Mojarrad, "Assembly Work Space Analysis For An IBM 7565 Robot Manipulator For Applications To Chemical Treatments of Silicon Wafers", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1992)
42. Sainan Feng, "Kinematic Modeling of Elastic Robots", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1991)
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40. Graham Bartlett, "A CIM Planning Methodology For Analysis of Factory Automation", University of New Mexico, Mechanical Engineering Department, Albuquerque, New Mexico (co-chair of M.Sc. Committee), (May 1990)
39. John McSheehy, "Static, Kinematic, and Dynamic Analyses of A Four-Bar Linkage Chain With Application For Design", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989).
38. Lawrence T. James, "Combined Natural Convection and Radiant Heat Transfer, " Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (December 1989), (co-chair of M.Sc. committee)
37. Adam Slavin, "Modeling of Robotic Elastic Deformation", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1989)
36. Ted Sahd, "Manufacturing Light Aircrafts in New Mexico: Possible Alternatives", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (co-chair of M.Sc. Committee), M.Sc., (December 1989)

35. Donald J. Christison, "Development of A Bar Code Scanner Vision System For Robotic Manipulation of Randomly Oriented Objects", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989)
34. Carmine Izzi, "CAD-Based Two-Dimensional Feature Recognition For CNC Machining", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989)
33. John Halbleib, "CAD-Based Automatic Tool Selection and CNC Machining Based on Features", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989)
32. Donald R. Striker, "Automated Storage Retrieval System Operation and Performance Optimization", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989)
31. Jeffrey D. Hanan, "A Rule-Based Advisor For Configuring and Sizing CIM Systems Based on Performance Criteria", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1989)
30. Bijan Pejman, "Heat Transfer in Robotic Gloves", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (Co-chairman of M.Sc. committee), M.Sc., (May 1989)
29. Glen A. Smith, (AFWL), " Investigation on the Effects of Mechanical Coupling of the Programmed Motion of A Robot Arm and Independent Periodic Base Disturbances," Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1988)
28. John David Novat, "PC Control of A DC Motor", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1988)
27. Hadie Fotouhie, "Code Development for Convective Burning of Pyrotechnic Materials," Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (Co-chairman of M.Sc. committee), M.Sc., (May 1988)
26. Chung C. Huang, "Automated Mesh Generation," Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, (Co-chairman of M.Sc. committee), M.Sc., (May 1988)
25. Massoud Ahghar, "Development of a Coordinate Measuring System for CNC Machining of Complex Surfaces", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1988)

24. Sheryl H. Norenberg, (SNL) "Burn Rate Studies of Titanium Subhydride Potassium Perchlorate Pyrotechnic Materials", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1988)
23. Hamid Ashouri, "Design, Construction, and Modeling of An Articulate, Five-Fingered Computer-Controlled Robot Hand", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, M.Sc., (May 1987)
22. Boojoong Yong, "Modeling of Robotic Workspaces for Multiple-Robot Systems", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (June 1987)
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19. Timothy Rude, (AFWL) "Operation of a Bridgeport Boss 5 CNC Mill From a Zenith 158 PC", Department of Mechanical Engineering University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1986)
18. Eming Chen, "Design and Analysis of a Tricycle Robotic Carriage System with a Mounted Manipulator," Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, M.Sc., (December 1986)
17. A. Akbarzadeh, "Design and Construction of a 6-Axis Robot Manipulator; LOBOT-1 with voice and vision", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, M.Sc., (September 1986)
16. J. Devaprasad, "Development of Semi-Conductor Thin Film Temperature Using a Laser", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, M.Sc., (August 1986)
15. Thomas Grant McDonald, "Measuring Friction Coefficient and Contact Resistance Inside A Scanning Auger Microscope", University of New Mexico, Mechanical Engineering Department, Albuquerque, New Mexico, (co-chair of M.Sc. Committee), M.Sc., (May 1986)
14. Robert A. Hart, "Dynamic Modeling of A Legged Locomotion Vehicle", University of New Mexico, Mechanical Engineering Department, Albuquerque, New Mexico (co-chair of M.Sc. Committee), M.Sc., (May 1986)

13. Robert T. Cook, "Design and Modeling of a Robotic Arm with an Ultrasonic Distance Sensor", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (May 1984)
12. David Campbell, "Inverse Kinematic Solutions for Slightly Flexible Robotic Manipulators", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (December 1984)
11. Robert Olsen, "Frequency Distribution of Coordination Number and Contact Force in a Randomly Packed Bed of Spheres by a Titration Technique", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (December 1984)
10. Allan Tabesh, "Design and Modeling of a Special Gripper for GE-P50-Robot", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (December 1984)
9. Ioannis Minis, "Computerized and Automated Techniques in Determining the Frequency Distribution of Voids in Granular Materials", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (August 1983)
8. Mike Caporali, "Design and Bond Graph Modeling of a Multi-Fingered Robot Hand", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (August 1982)
7. Gary Sweed, "Computerized and Automated Determination of Frequency Distribution of Voids in Granular Materials", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (May 1982)
6. Ahmad Shahrpass, "Frequency Distribution of Voids in 2-D Granular Materials", Mechanical and Industrial Engineering, Department, Clarkson University, Potsdam, New York, M.Sc., (May 1981)
5. Hooshang Jozavi, "Acoustic Response Modifications in Elastic Media Due to Presence of Cracks", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (December 1980)
4. David J. Wells, "Fuzzy Set Theory and Fault Diagnosis of Mechanical Systems", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, M.Sc., (May 1980)
3. M. Balakrishnan, "Large Amplitude Oscillations of Hyperelastic Shells", Mechanical Engineering Department, Shiraz University, Shiraz, M.Sc., (May 1976)

2. Michael Gascoigne, "A Method for Optimization of Stochastic Processes", Mechanical Engineering Department, Shiraz University, Shiraz, Iran, M.Sc., (May 1975)

1. Ahmad Ajal Looian, "Fluid Dynamics of Magnetic Suspensions", Mechanical Engineering Department, Shiraz University, Shiraz, Iran, M.Sc., (May 1974)

## **18. Ph.D. (Doctoral) Students and Dissertations (Listing the most recent ones first)**

25 Marzieh Memar, "Development of a Unique Robotic Surgical System for Ear Surgery", Chair of Doctoral Committee with Professors Senthil Vel and Ashish Deshpande, Department of Mechanical Engineering, and Professor Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, Ph. D., May, 2014.

24 Morteza Seidi, "Neural net Control of Ionic Polymer Metal Composite (IPMC) Artificial Muscles In Rehabilitation Robotics", Chair of Doctoral Committee with Professors Senthil Vel and Vince Caccese, Department of Mechanical Engineering, and Professor Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, Ph. D., May, 2014.

23 Hind Derar, "Development of Advanced Surgical Robots For Hip Replacement Surgery", Chair of Doctoral Committee with Professors Senthil Vel and Vince Caccese, Department of Mechanical Engineering, and Professor Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, Ph. D., May, 2012.

22 Yousef Bahramzadeh, "Development of Advanced Distal-Tip Surgical Robots With Smart Materials Actuators", Chair of Doctoral Committee with Professors Senthil Vel and Vince Caccese, Department of Mechanical Engineering, and Professor Rick Eason, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, Ph. D., May, 2012.

21 Matt Leland, "Development of A Wireless IPMC Sensor Network For Inflatable Space Structures", Chair of Doctoral Committee with Professors Vince Caccese, Department of Mechanical Engineering, and Professor Ali Abedi, Department of Electrical and Computer Engineering, The University of Maine, Orono, ME 04469, Ph. D., May, 2012.

20. Mehran Mojarrad, " Study of Ionic Polymeric Gels As Smart Materials and Artificial Muscles for Biomimetic Swimming Robotic Applications", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico., Ph.D., December (2001)

19. Guoping Wang, "A General Design of Bias Force Shape Memory Alloy (BFSMA) Actuators and An Electrically-Controlled SMA Knee and Leg Muscle Exerciser for Paraplegics and Quadriplegics", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico,, Ph.D. (May 1998)
18. Robert Alvarez, "Quantifying Multirate, Parallel and Asynchronous Control Law Implementation Performance Effect", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico,, Ph.D., May (1997)
17. Ali. A. Tootoonchi, "Modeling, Design and Manufacturing of Multiple End-Effector Flexible Robotic Systems", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, Ph.D. , May (1996)
16. Eming Chen, "Dynamic Analysis and Experimental Investigation on Position and Force Control for Flexible Link Manipulators“, Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, Ph.D., May (1995)
15. Hyunsok Pang, " Kinematics, Dynamics and Control of Hybrid Manipulators", Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, Ph.D., May (1995)
14. Hossein Sabbagh, "Modeling of Robot Manipulators Moving in a Viscous Medium", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, Ph.D., May (1991)
13. Bing Chin Chiou, "Dynamic Stability of Flexible Robot Manipulators", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, Ph.D., (December 1989)
12. Vincent B. DeGregorio, "The Effects of Sample Preparations on the Liquefaction Potential of Sand", Civil and Environmental Engineering Department, Clarkson University, Potsdam, New York, (Co-chairman of Ph.D. Committee), Ph.D. May (1988)
11. Kambiz Salari, "3-D Numerical Simulation of Turbulent Flow", University of New Mexico, Mechanical Engineering Department, Albuquerque, New Mexico, (Co-chairman of Ph.D. Committee), Ph.D., December (1988)
10. Sherman Wilcox, "A Motion Analysis of the Phonetic Structure of Finger Spelling", Department of Linguistics, University of New Mexico, Albuquerque, New Mexico, (co-chair of Ph.D. Committee), Ph.D., May (1988)
9. M.A.A. Mohamed, "Stick-Slip and Friction Noise Theory and Experiments", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, (co-chairman of Ph.D. Committee), Ph.D., January (1987)

8. Ali Meghdari, "Kinematics, Deformation Characteristics and Constitutive Equations for Flexible Robot Manipulators", Mechanical Engineering Department, University of New Mexico, Albuquerque, New Mexico, Ph.D., May (1987)
7. Samir Zaki Abdel-Rahman, "On the Stability of the Liquid-Filled Projectiles", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, Ph.D., May (1986)
6. Frank Zirilli, "Free Convection from Parallel Plates", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, (co-chair of Ph.D. committee), Ph.D., May (1985)
5. Y.T. Kim, "Kinematics, Dynamics and Nonlinear Control of Robot Manipulators", EECE Department, University of New Mexico, Albuquerque, New Mexico, (co-chair of Ph.D. committee), Ph.D., March (1985)
4. David John Wells, "Failure Diagnosis for Complex Dynamic Engineering Systems Using Fuzzy Sets and Systems Theory", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, Ph.D., July (1984)
3. Shu-Sheng J. Siah, "Two Dimensional Shear Flow of a Granular Material", Civil and Environmental Engineering Department, Clarkson University, Potsdam, New York, (co-chair of Ph.D. committee), Ph.D., May (1983)
2. Kin-Forie Chiou, "Modeling of Ice Jams in Nonuniform Channels", Mechanical and Industrial Engineering Department, Clarkson University, Potsdam, New York, (co-chair of Ph.D. committee), Ph.D., (May 1982)
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## **19. Professional References:**

- Professor James R. Asay, Emeritus Research Professor, Institute for Shock Physics, Department of Physics and Astronomy, Washington State University, Pullman, WA 99164-2816, Member: National Academy of Engineering, (email: [jamesasay@aol.com](mailto:jamesasay@aol.com) or [jrasay@wsu.edu](mailto:jrasay@wsu.edu)), Tel: (505) 410 6301 and (509) 335-6439
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- Professor Howard Yonas, MD, Professor and Chairman: Department of Neurosurgery, School of Medicine, University of New Mexico, Albuquerque, NM 87131 (email: [hyonas@salud.unm.edu](mailto:hyonas@salud.unm.edu))
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- Professor Arsalan Razani, Professor, Department of Mechanical Engineering, University of New Mexico, Albuquerque, NM 87131, (email: [razani@unm.edu](mailto:razani@unm.edu))
- Professor J.E. Thompson, Professor and Dean: College of Engineering, University of Missouri-Columbia, Columbia, MO, 65211, (email: [thompsonje@missouri.edu](mailto:thompsonje@missouri.edu))
- Dr. David R. Martinez, Manager, Structural Dynamics & Smart Structures, Sandia National Laboratories, Albuquerque, New Mexico, 87185, (email: [drmarti@sandia.gov](mailto:drmarti@sandia.gov))
- David Soltanpour, MD., Chief Ophthalmologist and Microsurgeon, New York Eye and Ear, New York, NY (email: [soltanpour@aol.com](mailto:soltanpour@aol.com))

- Dr. Ali Keshavarzi, Director of Design, Taiwan Semiconductor Manufacturing Company Limited, 20083 Northcrest Square, Cupertino, CA 95014, (email: [akeshavarzi@yahoo.com](mailto:akeshavarzi@yahoo.com)), Tel: (503) 806-9061, Fax: (503) 264-6168

## **20. Refereed Research Publications In Journals, Book Chapters and Encyclopedias (listing the most recent ones first)**

- 213 R. Glaser, V. Caccese and M. Shahinpoor, “Shape Monitoring of a Beam Structure from Measured Strain or Curvature”, **Int. Journal of Experimental Mechanics**, Springer Publishing Company, accepted for publication, (2011) vol. 51, no. , pp. - , (2011)
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- 208 Mohsen Shahinpoor, “A Review of Patents on Implantable Heart-Compression/Assist Devices and Systems”, **“Recent Patents on Biomedical Engineering Journal”**, volume 3, pp. 54-71, (2010), Bentham Science Publishers Ltd., Oak Park, IL 60301-0446, USA, (2010)
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## **22. Research Papers Presented At And Published In Conference Proceedings (listing the most recent ones first)**

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- 237 Y. Bahramzadeh and M. Shahinpoor, "Charge Modeling of Ionic Polymer-Metal Composites for Dynamic Curvature Sensing", *Proceeding of SPIE 18<sup>th</sup> Annual*

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- 233 Mohsen Shahinpoor, "Electromechanics of Ionic Polymer Metal Composites-Fundamentals", **16<sup>th</sup>. US National Congress of Theoretical and Applied Mechanics**, June 27-July 2, 2010, College Park, PA., CD ROM Proceedings, (2010)
- 232 Mohsen Shahinpoor, "Surgical Correction of Ptosis by Ionic Polyacrylonitrile Artificial Muscles", **American Society for Artificial Internal Organs (ASAIO), 56<sup>th</sup>. Annual Conference**, May 27-29, Baltimore, Md., CD ROM Proceedings, 2010
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- 228 Mohsen Shahinpoor, (**invited**), “Modelling of Large Deflection of IPMC Plates”, Special Session on “Ionic Polymer Metal Composites”, in **DSC09, 2009 ASME Dynamic Systems and Control Conference** and Bath/ASME Symposium on Fluid Power & Motion Control, Theme: System Engineering, Renaissance Hollywood Hotel, October 12-14, 2009, Hollywood, California
- 227 Mohsen Shahinpoor, “Micro-catheter equipped with a biomimetic soft robotic polymeric artificial muscle distal tip bender, actuator and sensor for neurological endovascular surgery”, Proceedings of the 22<sup>nd</sup>. International Congress on Computer-Assisted Radiology and Surgery (**CARS 2008**), Barcelona, Spain, June 23-28, (2008)
- 226 Mohsen Shahinpoor, “Ionic Polymeric Conductor Nano Composites (IPCMCs) As Distributed Nanosensors and Nanoactuators”, Proceedings of the 3<sup>rd</sup>. International Congress on Smart materials, Structures and Systems (**CIMTEC 2008**), Acireale, Sicily, Italy, June 8-13, (2008)
- 225 Ron Lumia and Mohsen Shahinpoor, “IPMC Microgripper Research and Development”, Proceedings of the 4<sup>th</sup>. International Congress on **Biomimetics, Artificial Muscles and Nano-Bio 2007**, Cartagena, Spain, Europe, November 6-8, (2007)
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### **23. Publications of Limited and Controlled Circulation**

**Over 52 government and proprietary publications of limited and controlled circulation status. Available upon request but restricted to US Government Export Control.**

### **24. Summary of Academic Services & Achievements**

**1-Over 40 years of dedicated teaching of engineering courses to over 4958 students,**

**2-Three teaching excellence awards and four research excellence awards,**

**3-Over \$14m in research and academic funding,**

**4-Some 589 publications and printed works (212 journal, book chapters and encyclopedia refereed publications, 46 books and edited volumes publications, 238 conference proceedings publications, 52 controlled (government, defense and National labs) publications of limited distributions, and 57 patents and published patent applications,**

**5-Establishment of 17 academic educational and research laboratories and centers,**

**6- Serving as Academic Department Chair Three Times and As Associate Dean of Engineering Two Times,**

**7-Achieving peer recognition to become Fellow of ASME (American Society of Mechanical Engineers) and Fellow of IOP (Institute of Physics),**

**8-Achieving peer recognition to become a member of NY Academy of Sciences,**

**9-Obtaining 5 Non-US patents, 31 US patents, 16 US patents pending and 27 patents in progress,**

**10-Advising and completing some 70 Masters Students,**

**11-Advising and completing some 24 Ph.D. (Doctoral ) students,**

**12-Helping establish a high technology company (Environmental Robots Incorporated) to become the world's leader in products involving nano composites, distributed nanosensors, nanoactuators, nanotransducers and artificial muscles, intelligent biomedical products and ionic polymeric science kits,**

**13-Achieving peer recognition to be appointed as endowed chair professor three times; Halliburton Chair Professor at University of New Mexico, Regents Chair Professor at University of New Mexico and Richard C. Hill Professor at University of Maine. Distinguished Induction in 2008 As A Member to the Prestigious Francis Crowe Society.**