

## PERSONAL INFORMATION

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### **Abbas Fattah, Ph.D.**

Senior Lecturer  
Department of Mechanical Engineering  
Widener University  
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## EDUCATION

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### **Ph.D. in Mechanical Engineering, 1991-1995**

McGill University, Montreal, Canada  
Grade Point Average: 3.93/4.00

**Thesis:** Dynamics of Robotic Manipulators with Flexible Links and Kinematic Loops

### **Master of Applied Science in Mechanical Engineering, 1987-1989**

Isfahan University of Technology, Isfahan, Iran  
Grade Point Average: 16/20, First rank in the Department

**Thesis:** Dynamics Behavior of Vehicles with an Optimized Design for Suspension System

### **Bachelor of Science in Mechanical Engineering, 1973-1978**

Shiraz University, Shiraz, Iran  
Grade Point Average: 3.1/4.0, Second rank in the Department

## EMPLOYMENT HISTORY

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### I: Academic

- Senior Lecturer, Department of Mechanical Engineering, Widener University, 2015- present
- Visiting Associate Professor, Department of Mechanical Engineering, Widener University, 2012- 2015
- Supplemental Faculty and Professional, Department of Mechanical Engineering, University of Delaware, 2006- 2011
- Faculty, 2006-2009, Department of Mechanical Engineering, Isfahan University of Technology, Isfahan, Iran
- Research Scientist, 2002-2006, Department of Mechanical Engineering, University of Delaware, Newark, DE, U.S.A.
- Visiting Professor, 2001-2002, Department of Mechanical Engineering, University of Delaware, Newark, DE, U.S.A.
- Assistant Professor, 1996-2001, Department of Mechanical Engineering, Isfahan University of Technology, Isfahan, Iran
- Research Assistant, 1991-1995, Centre for Intelligent Machines, McGill University, Montreal, Canada
- Teaching Assistant, 1991-1995, Department of Mechanical Engineering, McGill University, Montreal, Canada
- Lecturer, 1981-1987 and 1989-1990, Department of Mechanical Engineering, Isfahan University of Technology, Isfahan, Iran

### II: Administrative

- Member of various committees of School of Engineering in Widener University
  - \*Graduate Committee, Fall 2014-present
  - \*Academic Review Committee, Fall 2013-Fall2014
- Supervisor of Engineering Design Projects of the Mechanical Engineering Department for the National Scientific Competition, 1996-2001, Isfahan University of Technology, Isfahan, Iran
- Research Coordinator of Department of Mechanical Engineering, 1997-2001, Isfahan University of Technology, Isfahan, Iran
- Coordinate for Industrial Liaison, 1983-1987, Working for different industrial projects, Isfahan University of Technology, Isfahan, Iran
- Member of various committees in Isfahan University of Technology:
  - \* University Research Committee, 1997-2001
  - \* Department of Mechanical Engineering Graduate Studies Committee, 1998-2001
  - \* Department of Mechanical Engineering Search and Promotion Committee, 1997-2001
  - \* University Research Projects Committee, 1999-2001
- Member of Engineering Industry Committee of Isfahan Science and Technology Town, 1996-2001

### **III: Practical Experience**

- Design, control and fabrication of fully and underactuated planar biped robots, 2006-2010
- Design and fabrication of a gravity-balanced leg orthosis for lower extremity, 2002-2010
- Design and fabrication of a planar cable-robot and a reactionless mechanism, 2002-2010
- Supervising engineering design projects of the department for the national scientific competition, 1996-2001
- Consulting for several industrial companies in robotics and automation as well as vibration and design projects, 1997-2001
- Consultant Engineer, 1977-1979, Design of heating and cooling systems for both industrial and residential compound, AFA Company, Isfahan, Iran

## **TEACHING EXPERIENCES**

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### **I: Courses Taught**

(Widener University, Drexel University, University of Delaware, Isfahan University of Technology, McGill University)

#### **Undergraduate Level**

- Engineering Vibrations
- Mechanics of Deformable Bodies
- Machine Design: Kinematics and Kinetics
- Design
- Mechanics of Materials Lab
- Design of Mechanical Systems
- Robotics
- Kinematics
- Mechanics of Materials
- Applied Mechanics
- Statics
- Senior Project

#### **Graduate Level**

- Engineering Mathematics I
- Advanced Topics in Robotics
- Mechanics of Robotics System I
- Mechanics of Robotics System II
- Advanced Mechanics of Materials
- Advanced Vibration
- Advanced Mathematics
- Advanced Dynamics

### **II: Graduate Students Supervision**

- 3 Ph.D. Students
- 20 M Sc. thesis completed

### **III: Graduate Students Co-supervision**

- 7 Ph.D. thesis completed
- 20 M Sc. thesis completed

## RESEARCH EXPERIENCES

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### I: Research Activities

- Design, control and fabrication of planar fully actuated and underactuated biped robots
- Design and fabrication of rehabilitation robots and mechanisms (joint project with physical therapy and center for biomedical engineering research)
- Machine/human interaction (joint project with physical therapy and center for biomedical engineering research)
- Design and optimization of parallel, cable-suspended and cooperative robots
- Design and simulation of reactionless space and ground mechanisms
- Computational methods for mechanical systems such as space structures
- Robotics design and automation
- Modeling and simulation of robotics systems with rigid and flexible links

### II: Research Experiences

- Design and control approaches for a novel biped robot, 2004-2010
- Design and fabrication of a passive gravity-balanced assistive device for sit-to-stand tasks for elderly people, 2004-2010
- Design and fabrication of a rehabilitation robot for the individuals with leg impairment, 2002-2010
- Workspace and design of cable-suspended robots, 2001-2010
- Design and fabrication of reactionless space and ground robots, 2001-2006
- Optimal design of parallel manipulators, 1999-2010
- Kinematic and dynamic analysis of a long vehicle chassis using finite element method, 1998-2000
- Kinematic analysis of a 3DOF spatial parallel manipulator, 1998-2000
- Kinematics, dynamic and design of a 3DOF parallel manipulator with new architecture which is the moving mechanism of a flight simulator project, 1996-1999
- C2 project (Simulation, Control and Planning in Robotics) of *Institute for Robotics and Intelligent Systems (IRIS)*, a network of Canadian centres of excellence, 1992-1995
- Optimal design for suspension system of long vehicles, 1987-1989

## MEMBERSHIP

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- Member ASME

## HONORS AND AWARDS

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- Name in Who'sWho in America, 2004, 2005, 2006
- Name in Who'sWho in Science and Engineering, 2004, 2005
- Topics Co-Organizer and Session Chairman, ASME Design Engineering Technical Conferences, Mechanisms and Robotics Conference, 2004, 2005, 2006
- Topics Co-Organizer and Session Chairman, ASME International Mechanical Engineering Congress and R&D Expo, Advances in Robot Dynamics and Control Symposium, 2004, 2005
- International Program Committee, International Conference on Robotics and Applications, 1999, 2000, 2001, 2003, 2004, 2005, 2006
- Name in America's Registry of Outstanding Professionals, 2003
- Session Chairman, International Conference on Robotics and Applications, 2000
- Scientific Program Committee, International Mechanical Engineering Conference, 1997, 1998, 1999, 2000, 2001
- Session Chairman, International Mechanical Engineering Conference, 1997, 1998, 1999, 2000, 2001
- Research activities award from Isfahan University of Technology, 2001
- ISI (Institute for Scientific Information) chosen paper award from Ministry of Science, Research and Technology, 2000
- Scholarship to study Ph.D. at McGill University, 1991-1995
- First rank student award (Graduate) from Isfahan University of Technology, July 1989
- Second rank student award (Undergraduate) from Shiraz University, July 1978
- A referee and judge to many submitted publications all over the world:
  - \* IEEE Transactions on Robotics
  - \* Transactions of ASME, Journal of Mechanical Design
  - \* Transactions of ASME, Journal of Mechanism and Robotics
  - \* IEEE Transactions on Robotics and Automation
  - \* IEEE Transactions on Control Systems Technology
  - \* Robotica
  - \* MECCANICA
  - \* Mechanism and Machine Theory
  - \* Journal of Engineering
  - \* International Journal of Engineering
  - \* Iranian Journal of Science and Technology

## PATENTS

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S. K. Agrawal, **A. Fattah** and S. Banala, "Apparatus for Gravity Balancing Orthosis", *US Patent No. 7544155B2*, June 9, 2009.

S. K. Agrawal, **A. Fattah**, G. Catlin and J. Hamnett " Passive Gravity-Balanced Assistive Device for Sit-to-Stand Tasks", *US Patent No. 7601104*, October 13, 2009.

## LIST OF PUBLICATIONS

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### I: Articles in Journals

1. R. Dehghani, **A. Fattah**, E. Abedi, 2015, "Cyclic gait planning and control of a five-link biped robot with four actuators during single support and double support phases", *Multibody System Dynamics*, Vol. 33, pp.389-411.
2. A. Mokhtarian, **A. Fattah**, S.K. Agrawal, 2015, "A passive swing-assistive planar external orthosis for gait training on treadmill", *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, Vol. 37, pp.1-10.
3. A. Mokhtarian, **A. Fattah**, S.K. Agrawal, 2013, "An Assistive Passive Pelvic Device for Gait Training and Rehabilitation Using Locomotion Dynamic Model", *Indian Journal of Science and Technology*, Vol. 6, pp. 4168-4181.
4. M. Sadeghi, M. Emadi Andani, M. Parnianpour, **A. Fattah**, 2013, "A Bio-Inspired Modular Hierarchical Structure to Plan the Sit-to-Stand Transfer under Varying Environmental Conditions", *Neurocomputing*. Vol. 118, pp.311-321.
5. **A. Fattah**, K. Hajizadeh , S.K. Agrawal, 2011, "Gravity Balancing of a Human Leg using an External Orthosis", *Journal of Medical Devices, Transactions of ASME*. Vol.5, No. 1, pp.1-10.
6. **A. Fattah** and R. Dehghani, 2011, "Stable Gait Planning and Robustness Analysis of a Biped Robot with One Degree of Underactuation", *International Journal of Robotics*, Vol.2, pp.1-12.
7. R. Dehghani and **A. Fattah**, 2010, "Stability analysis of gait planning and robust control of a planar underactuated biped robot", *International Journal of Humanoid Robotics*, Vol. 7, No. 4, pp. 535-563.
8. S. K. Agrawal, S. K. Banala, **A. Fattah**, V. Sangwan, V. Krishnamoorthy, J. P. Scholz and W. L. Hsu, 2007, "Assesment of Motion of a Swing Leg and Gait

Rehabilitation with a Gravity Balancing Exoskeleton ", *The IEEE Transactions on Neural systems and Rehabilitation Engineering*. Vol. 15, No. 3, pp.410-420.

9. S. K. Agrawal and **A. Fattah**, 2006, "Motion Control of a Novel Biped with Nearly Linear Dynamics", *IEEE/ASME Transactions on Mechatronics*, Vol. 11, No. 2, pp. 162-168.
10. S. K. Banala, S. K. Agrawal, **A. Fattah**, V. Krishnamoorthy, W. L. Hsu, J. P. Scholz and K. Rudolph, 2006, "Gravity-Balancing Leg Orthosis and Its Performance Evaluation", *IEEE Transactions on Robotics*, Vol. 22, No.6, pp. 1228-1239.
11. **A. Fattah**, S. Agrawal, G. Catlin, J. Hamnett, 2006, "Design of a Passive Gravity-Balanced Assistive Device for Sit-to-stand Tasks", *Journal of Mechanical Design, Transactions of the ASME*, Vol. 128, No. 5, pp.1122-1129.
12. **A. Fattah** and S. Agrawal, 2006, "On the Design of Reactionless 3-DOF Planar Parallel Mechanisms", *Mechanism and Machine Theory*, Vol. 41, No. 1, pp.70-82.
13. **A. Fattah** and S. Agrawal, 2005, "On the Design of a Passive Orthosis to Gravity Balance Human Legs", *Journal of Mechanical Design, Transactions of the ASME*, Vol. 127, No.4, pp.802-808.
14. **A. Fattah** and S. Agrawal, 2005, "On the Design of Cable-Suspended Planar Parallel Robots", *Journal of Mechanical Design, Transactions of the ASME*, Vol. 127, No.5, pp.1021-1028.
15. **A. Fattah** and S. Agrawal, 2005, "Design and Simulation of a Class of Spatial Reactionless Manipulators", *Robotica*, Vol. 23, No. 1, pp.75-81.
16. S. Agrawal and **A. Fattah**, 2004, "Gravity-Balancing of Spatial Robotic Manipulators", *Mechanism and Machine Theory*, Vol. 39, No.12, pp.1331-1344.
17. S. Agrawal and **A. Fattah**, 2004, "Theory and Design of an Orthotic Device for Full or Partial Gravity-Balancing of a Human Leg During Motion", *The IEEE Transactions on Neural systems and Rehabilitation Engineering*. Vol. 12, No. 2, pp.157-165.
18. J. Pusey, **A. Fattah**, S. K. Agrawal and E. Messina, 2004, "Design and Workspace Analysis of a 6-6 Cable-Suspended Parallel Robot", *Mechanism and Machine Theory*, Vol. 39, No.7, pp.761-778.
19. S. Agrawal and **A. Fattah**, 2004, "Reactionless Space and Ground Robots: Novel Designs and Concepts Studies", *Mechanism and Machine Theory*, Vol. 39, No.1, pp.25-40.
20. S. Agrawal, **A. Fattah** and S. Banala, 2003, "Design and Prototype of a Gravity-Balanced Leg Orthosis", *International Journal of Human-friendly Welfare Robotic Systems*, Vol.4, No.3, pp.13-16.



21. **A. Fattah** and A.M. Hasan Ghasemi, 2002, "Isotropic Design of Spatial Parallel Manipulators", *The International Journal of Robotic Research*, Vol.21, No.9, pp.811-824.
22. **A. Fattah** and M. Oghbaei, 2001, "Forward Position Kinematics of a Parallel Manipulator with new architecture", *International Journal of Engineering*, Vol.14, No. 3, pp. 239-246.
23. **A. Fattah** and Gh. Kasaei, 2000, "Kinematics and Dynamics of a Parallel Manipulator with a new architecture", *Robotica*, Vol.18, No. 5, pp. 535-543.
24. **A. Fattah**, B. Tahmasebi, 1999, "Kinematics and Dynamics of two Robots in Spatial Moving of an Object", (in Persian) *ESTEGHLAL: Journal of Research in Engineering & Technology*, Vol.18, No.1, pp.103-112.
25. **A. Fattah**, J. Angeles, and A. K. Misra, 1997, "Dynamics of Two Cooperating Flexible-Link Manipulators-Planar Case", *Transactions of Canadian Society of Mechanical Engineering*, Vol. 21, No.1, pp.1-17.
26. **A. Fattah**, A. K. Misra and J. Angeles, 1994, "Modeling and Simulation of Planar Mechanical Systems with Flexible Links and Kinematic Loops", *Machine Vibration*, Vol.3, Nos2&3, pp.130-13.

## II: Published Contributions to Academic Conferences

27. **A. Fattah** and, A. Fakhari, 2010, "Trajectory Planning of Walking with Different Step Lengths of a Seven-Link Biped Robot ", *Proc. of the ASME 2010 International Design Engineering Technical conferences & Computers and Information in Engineering Conference IDETC/CIE 2010*, August 15 - 18, 2010, Montreal, Quebec, Canada, DETC2010-28626.
28. A. Mokhtarian, **A. Fattah**, S.K. Agrawal, 2010, "A Novel Passive Pelvic Device for Assistance during Locomotion", *Proc. of the IEEE International Conference on Robotics and Automation*, May 3-8, 2010, Anchorage, Alaska, USA, pp.2241-2246.
29. R. Dehghani and **A. Fattah**, 2009, "Observation Design to estimate shank angle for motion control of an underactuation biped robot", *Proc. of the ASME 2009 International Design Engineering Technical conferences & Computers and Information in Engineering Conference IDETC/CIE 2009*, August 30 - September 2, 2009, San Diego, California, USA, IDETC2009-86677.
30. H. Hadian and **A. Fattah**, 2008, "Best kinematic performance analysis of a 6-6 cable-suspended parallel robot", *Proc. of 2008 IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications*, October 12-15, pp.510-515.
31. R. Dehghani and **A. Fattah**, 2008, "Motion control and efficiency analysis of a special design five-link biped robot with torso", *Proc. of 2008 IEEE/ASME*

*International Conference on Mechatronic and Embedded Systems and Applications*, October 12-15, pp.198-203.

32. **A. Fattah** and R. Dehghani, 2008, "Stability analysis and robust control of a biped robot with four link and three actuators", *Proc. of the 2008, IEEE/RSJ International Conference on Intelligent Robotics and Systems*, September 22-26, pp.3420-3425.
33. **A. Fattah** and S. K. Agrawal, 2007, " Gravity Balancing of Human Leg using an External Orthosis", *Proc. of the IEEE International Conference on Robotics and Automation*, April 10-14, Rome, Italy.
34. **A. Fattah** and S. K. Agrawal, 2006, "Gravity-Balancing of Classes of Industrial Robots", *Proc. of the IEEE International Conference on Robotics and Automation*, May 15-19, Orlando, Florida.
35. S. K. Agrawal, **A. Fattah**, and S. Oh, 2005, "Design and Control Approaches for a Novel Biped with Nearly Linear Dynamics", *Proc. of the ASME International Mechanical Engineering Congress and Exposition, Advances in Robot Dynamics and Control Symposium* November 5-11, Orlando, Florida, IMECE2005-81620.
36. **A. Fattah**, S. K. Agrawal and J. Fitzgibbons, 2004, "Design of a Gravity-Balanced Assistive Device for Sit-to-Stand Tasks", *Proc. of the ASME Design Engineering Technical Conferences, 28th Biennial Mechanisms and Robotics Conference, The 4<sup>th</sup> Symposium on Medical Devices and systems*, Sept. 28-Oct. 2, Salt Lake City, Utah, DETC04/57434.
37. **A. Fattah** and S. K. Agrawal, 2004, "Gravity Balancing Rehabilitative Robot for the Human Legs", *Proc. of 26<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, September 1-5, San Francisco, CA.
38. **A. Fattah**, S. K. Agrawal, 2004, "On the Design of Planar Reactionless Parallel Mechanisms", *Proc. of the ASME Design Engineering Technical Conferences, 28th Biennial Mechanisms and Robotics Conference*, Sept. 28-Oct. 2, Salt Lake City, Utah, DETC04/57293.
39. S. K. Banala, S. K. Agrawal, **A. Fattah**, K. Rudolph, and J.P. Scholz, 2004, A Gravity Balancing Leg Orthosis for Robotic Rehabilitation, *Proc. of the 2004, IEEE International Conference on Robotics and Automation*, April 2004, pp.2474-2479.
40. S. K. Agrawal, and **A. Fattah**, 2003, "Design of an Orthotic Device for Full or Partial Gravity-Balancing of a Human Upper Arm during Motion", *Proc. of the 2003, IEEE/RSJ International Conference on Intelligent Robotics and Systems*, October 27-31, pp.2841-2846.
41. **A. Fattah**, S. K. Agrawal, and J. Fitzgibbons, 2003, "Design of a Passive Leg Orthosis for Gait Correction of Human Subjects", *Proc. of the Bioengineering Division of 2003 ASME International Mechanical Engineering Congress and R&D Expo*, November 15-21, IMECE 2003-43156.

42. J. Pusey, **A. Fattah** and S. K. Agrawal, 2003, "Design and Workspace Analysis of a 6-6 Cable-Suspended Parallel Robot", *Proc. of the 2003, IEEE/RSJ International Conference on Intelligent Robotics and Systems*, October 27-31, pp.2090-2095.
43. J. Franch, S. K. Agrawal, S. Oh, and **A. Fattah**, 2003, "Design of Differentially Flat Planar Space Robots: A Step Forward in their Planning and Control", *Proc. of the 2003, IEEE/RSJ International Conference on Intelligent Robotics and Systems*, October 27-31, pp.3053-3058.
44. S. K. Agrawal, **A. Fattah**, 2003, "Gravity-Balancing of Spatial Open-Chain Manipulators", *In proceedings, NaCoMM*.
45. **A. Fattah** and S. Agrawal, 2003, "Design and Modeling of Classes of Spatial Reactionless Manipulators", *Proc. of the 2003, IEEE International Conference on Robotics and Automation*, September 14-19, pp.3225-3230.
46. S. Agrawal, **A. Fattah** and et. al., 2003, "Design and Prototype of a Gravity-Balanced Leg Orthosis", *Proc. of the ICORR 2003 (Eighth International Conference on Rehabilitation Robotics)*, April 23-25.
47. **A. Fattah** and S. Agrawal, 2002, "Design of Cable-Suspended Planar Parallel Robots for an Optimal Workspace", *Proc. of the Workshop on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators*, October 3-4, Quebec City, Quebec, Canada.
48. **A. Fattah** and S. Agrawal, 2002, "Workspace and Design Analysis of Cable-Suspended Planar Parallel Robots", *Proc. of the ASME Design Engineering Technical Conferences, 27th Biennial Mechanisms and Robotics Conference*, Sept. 29-Oct. 2, Montreal, Canada.
49. S. Agrawal and **A. Fattah**, 2002, "Reactionless Space and Ground Robots: Novel Designs and Concept Studies", *Proc. of the Seventh International Conference on Control, Automation, Robotic and Vision (ICARCV 2002)*, December 2-5, Singapore, pp.809-814.
50. **A. Fattah** and S. Hadian Jazi, 2001, "Optimal Design of Parallel Manipulators", *Proc. of the 10th International Conference on Advanced Robotics (ICAR 2001)*, Budapest, Hungary, Aug. 22-25, pp.645-650.
51. **A. Fattah** and A.M. Hasan Ghasemi, 2001, "Isotropic Design of a 3DOF Spatial Parallel Manipulator", *Proc. of The 5th International Mechanical Engineering Conference*, May 27-29, Rasht, Iran, Vol. 4, pp. 583-590.
52. **A. Fattah** and A. M. Hasan Ghasemi, 2001, "Isotropic Design of Stewart Platform Mechanism", (in Persian) *Proc. of The 5th International and 9th Annual Conference of Iranian Society of Mechanical Engineers*, May 27-29, Rasht, Iran, Vol. 2, pp. 421-428.

53. **A. Fattah** and M. Oghbaei, 2000, "Singular Configurations and Workspace of a Parallel Manipulator with new Architecture", *Proc. of the ASME Design Engineering Technical Conferences, 26th Biennial Mechanisms and Robotics Conference*, Sept. 10-13, Baltimore, USA.
54. **A. Fattah** and M. Bashizadeh M., 2000, "Computation of the Extermum of the Leg Velocities of a Parallel Manipulator in a Specified Workspace", *Proc. of The Eighth Annual Conference of Iranian Society of Mechanical Engineers*, May 16-19, Tehran, Iran, Vol. 2, pp.547-555.
55. **A. Fattah**, M. Oghbaei, 1999, "Forward Position Kinematics of a Parallel Manipulator with new architecture", *Proc. of The IASTED International Conference on Robotics and Applications*, Oct. 28-30, Santa Barbara, USA, pp. 24-29.
56. **A. Fattah**, M. Mosayebi, 1999, "Kinematics and Dynamics of Stewart Platform with six Degrees of Freedom", (in Persian) *Proc. of the 7th Annual ISME Conference*, April 14-16, Zahedan, Iran, Vol.3, pp.1097-1106.
57. **A. Fattah**, M. Oghbaei, 1999, "The Closed form solution of Forward Position Kinematics of a Parallel Manipulator with new Architecture", (in Persian) *Proc. of the 7th Annual ISME Conference*, April 14-16, Zahedan, Iran, Vol. 3, pp.1107-1114.
58. **A. Fattah**, 1998, "Kinematics of a Parallel Manipulator with a New Architecture", *Proc. of The IASTED International Conference on Robotics and Manufacturing*, July 26-29, Banff, Canada, pp. 213-217.
59. **A. Fattah** and Gh. Kasaei, 1998, "Kinematics of a New-Type Parallel Manipulator", (in Persian) *Proc. of The Sixth Annual Mechanical Engineering Conference and Third International Mechanical Engineering Conference of the Iranian Society of Mechanical Engineers*, May 18-20, Tehran, Iran, Vol. 3, pp.1109-1117.
60. **A. Fattah** and Gh. Kasaei, 1998, "Dynamics of a New-Type Parallel Manipulator", (in Persian) *Proc. of The Sixth Annual Mechanical Engineering Conference and Third International Mechanical Engineering Conference of the Iranian Society of Mechanical Engineers*, May18-20, Tehran, Iran, Vol.3, pp.1119-1126.
61. **A. Fattah**, and B. Tahmasebi, 1997, "Kinematics and Dynamics of two Robots in Planar Moving of an Object", (in Persian) *Proc. of The 5th Annual Iranian Society of Mechanical Engineers Conference*, May 4-6, Tabriz, Iran, Vol.4, pp.1415-1423.
62. **A. Fattah**, J. Angeles, and A. K. Misra, 1996, "Modelling and Simulation of Planar Cooperating Flexible-link Manipulators", *Proc. of The Second*

*International Mechanical Engineering Conference*, May 14-17, Shiraz, Iran, Vol. 4, pp. 947-954.

63. **A. Fattah**, J. Angeles, and A. K. Misra, 1995, "Dynamics of a 3-DOF Spatial Parallel Manipulator with Flexible Legs", *Proc. of The IEEE International Conference on Robotics and Automation*, Nagoya, Japan, Vol. 2, pp.627-631.
64. **A. Fattah**, J. Angeles, and A. K. Misra, 1995, "Dynamics of Two Cooperating Flexible-link Manipulators", *Proc. of the 15th Canadian Congress of Applied Mechanics (CANCAM '95)*, Victoria, Canada, Vol. 2, pp.800-801.
65. **A. Fattah**, A. K. Misra, and J. Angeles, 1994, "Dynamics of a Flexible-Link Planar Parallel Manipulator in Cartesian Space", *Proc. of The ASME Design Automation Conference*, Minneapolis, U.S.A., DE-Vol.69-2, pp.483-490.
66. **A. Fattah**, J. Angeles, and A. K. Misra, 1994, "Direct Kinematics of a 3-DOF Spatial Parallel Manipulator with Flexible Legs", *Proc. of The ASME Mechanisms Conference*, Minneapolis, U.S.A., DE-Vol.72, pp.285-291.
67. K. S. Cho, N. Hori, J. Angeles and **A. Fattah**, 1994, "Model-Based Control of a Structurally Flexible Robot with a Kinematic Loop", *IRIS/PREARN Fourth Annual Conference* , June 21-23 , Toronto, Canada.
68. **A. Fattah**, J. Angeles, and A. K. Misra, 1994, "Direct Kinematics of a Spatial Parallel Manipulator with Flexible Legs", *Presented at the Robotics Mechanical Systems Graduate Students, Forum RMSGS, at the 12th Symposium on Engineering Applications of Mechanics*, June 14-15, Montreal, Canada.
69. **A. Fattah**, J. Angeles, and A. K. Misra, 1993, "Modelling and Simulation of Planar Mechanical Systems with Flexible Links and Kinematic Loops", *IRIS/PREARN Third Annual Conference*, June 8-11, Ottawa, Canada.
70. **A. Fattah**, J. Angeles, and A. K. Misra, 1993, "Modelling and Simulation of Planar Mechanical Systems with Flexible Links and Kinematic Loops", *Proceedings of the IRIS Workshop*, Vancouver, Canada.