

# Majid Hajhosseinali

m.hajhosseinali@gmail.com  
+98 912 4242084

Department of Mechanical Engineering,  
Sharif University of Technology  
Tehran, Iran

---

<b>Education</b>	<b>M.S., Mechanical Engineering, Biomechanics</b> 2013 Sharif University of Technology, Tehran, Iran. GPA: 18.57/20. Thesis: "The effects of personal factors (Body Weight) on spinal loads", Advisor Professor: Dr. Farahmand, Mechanical Engineering Department, Sharif University. Dr. Arjmand, Mechanical Engineering Department, Sharif University.
	<b>B.S., Biomedical Engineering, Biomechanics</b> 2010 Amirkabir University of Technology, Tehran, Iran. GPA: 18.36/20. Thesis: "Generating symbolic equations of motion of multibody systems with imperfect joints", Advisor Professor: Dr. Rostami, Biomedical Engineering Department, Amirkabir University.
	<b>H.S. Diploma, Mathematics and Physics</b> 2006 Mofid High School, Tehran, Iran. GPA: 19.1/20
<b>Interests</b>	<ul style="list-style-type: none"><li>• Mechanical Systems Design and Analysis</li><li>• BioMechanical Modeling</li><li>• Robotics</li><li>• Finite Element Analysis</li><li>• Optimization</li><li>• Rehabilitation</li><li>• Dynamic Systems</li><li>• Ergonomics and Occupational Biomechanics</li></ul>
<b>Licenses and Certifications</b>	<ul style="list-style-type: none"><li>• TOEFL iBT test taken at October 2012, Score: 96.</li><li>• GRE Paper based test taken at October 2013, Score: 303.</li><li>• <b>Certification on Industrial Engineering</b> by passing 21 selected units, Amirkabir University of Technology, 2009.</li><li>• Certification on Sport Engineering, Iranian Olympic Academy, 2007.</li></ul>
<b>Honors</b>	<ul style="list-style-type: none"><li>• <b>Ranked Second</b> among biomechanical engineering M.S students, Sharif University of Technology, 2012.</li><li>• <b>The Top B.S. Student</b> in Biomechanical Engineering, Amirkabir University of Technology, 2010.</li><li>• Ranked 6<sup>th</sup> in PhD entrance exam, 2013.</li><li>• Ranked 64<sup>th</sup> in higher education entrance exam among more than twenty thousand students, 2010.</li><li>• Offered admission of undergraduate double-degree program, Amirkabir University of Technology, 2007.</li><li>• Exempted from higher education entrance exam as an elite student, Amirkabir University of Technology, 2010.</li></ul>
<b>Papers</b>	<ul style="list-style-type: none"><li>• M. Hajhosseinali, N. Arjmand, A. Shirazi-Adl, F. Farahmand, M.S. Ghiasi, "A Novel Stability and Kinematics-Driven Trunk Biomechanical Model to Estimate Muscle and Spinal Forces". Medical Engineering &amp; Physics, Accepted.</li></ul> <p><b>Under Review and In Progress</b></p> <ul style="list-style-type: none"><li>• M. Shahab, M. Hajhosseinali, N. Arjmand, N. Fatourae, "Finite Element Modeling of the Lumbar Spine Stability in Healthy and Scoliosis Subjects", The Bi-Annual International Conference on Experimental Solid Mechanics (x-Mech-2014), Under Review.</li><li>• M. Hajhosseinali, N. Arjmand, M. Parnianpour, A. Shirazi-Adl, "Variation of Spinal Loads and Muscle Forces with Body Weight", Ready For Submission.</li></ul> <p><b>Talks</b></p> <ul style="list-style-type: none"><li>• M. Hajhosseinali, N. Arjmand, F. Farahmand, H. Nikpour, "Effect of considering stability requirements on antagonistic muscle activities using a musculoskeletal model of the human lumbar spine", 20<sup>th</sup> Iranian Conference of BioMedical Engineering (ICBME), Accepted.</li><li>• M. Hajhosseinali, N. Arjmand, "Presenting and Evaluating a New Musculoskeletal Lumbar Spine Model", Poster Section of 21<sup>th</sup> Iranian Society of Mechanical Engineering (ISME), 2012.</li></ul>

## Selected Courses (Credit)

- **Graduate Courses**
  - Musculoskeletal Systems (19 /20)
  - Occupational Biomechanics (18/20)
  - Applied Electronics (17.1/20)
  - Biomedical Instruments (18.2/20)
  - Finite Element Methods (18.7/20)
- **Undergraduate Courses**
  - Design of Mechanical Elements (18/20)
  - Dynamics (20/20)
  - Mechanics of Materials (20/20)
  - Fundamental of Programming (20/20)
  - Operation Research (Optimization) (17.5/20)

## Projects Summary

- **Graduate Projects**
  - Deriving upper body segmental parameters for 3D dynamic models using MRI images, In Progress.
  - Research on "Effects of Body Weight and Height on Spinal Loads", M.S Thesis, Fall 2013.
  - Crash simulation of a guardrail in order to find the optimum height, Fall 2013.
  - Full design, analysis (musculoskeletal model) and development of *a new outdoor exercise equipment* in order to train abdominal muscles, Fall 2011.
  - *Paraplegic gait simulation* with the aid of a complex musculoskeletal model combined with experimental kinematic data, Musculoskeletal Systems Course, Dr. Farahmand, Fall 2010.
  - Analyzing spine stability using a 6-DOF model using Abaqus, Matlab and Python scripts, Fall 2012.
  - Research on various global optimization methods (Colonial and Ant Colony Algorithm) to find the best algorithm for muscle recruitment problem solution.
  - Simulation of muscle activities for a subject wearing an *Auxiliary Jacket System* (AJS) to lift heavy objects. Muscle activities verified by EMG signals, Summer 2012.
  - Full design and development of electronic circuits and computer interface of a *digital data logger* for monitoring and storing human vital and sensory signals, Biomedical Instruments Course, Dr. Narimani, Fall 2010.
  - Full design and creation of a digital calculator, Applied Electronics Laboratory, Dr. Narimani, Fall 2010.
  - Research on "*Validation of spine model in AnyBody Modeling System and its comparison with other tools like 3DSSPP*", Occupational Biomechanics Course, Dr. Arjmand, Spring 2012.
  - Development of a *multi-purpose finite element code in Matlab* being able to solve complex 2D problems and draw output contours, FEM Course, Dr. Khoei, Fall 2011.
  - Development of a multi-purpose code able to solve *2D stress-strain problems using Boundary Element Method (BEM)* and create proper output to show in TecPlot, FEM Course, Dr. Khoei, Fall 2011.
- **Undergraduate Projects**
  - Research on "Generating equations of motion of multi-body systems with considering articular joint surfaces", B.S Thesis, Spring 2010.
  - *Analyzing temperature and stress shocks in a spherical shell made of Functionally Graded Materials (FGM)*, Spring 2012.
  - Research on "*FEM Analysis and Comparison of Two Types of Knee Prostheses*", Orthoses and Prostheses Course, Dr. Hashemi, Fall 2009.
  - Designing a *rehabilitation device* that helps patients to retrieve their balancing ability, Design of Mechanical Elements, Dr. Fatourai, Fall 2008.
  - Research on "*Vertebroplasty and Kyphoplasty* Advantages and Disadvantages", Introduction to biomechanics course, Dr. Katouzian, Spring 2008.

## Computer Skills

- **Software Applications**
  - CATIA
  - ABAQUS
  - MSC ADAMS
  - AnyBody Modeling System
  - OpenSim
  - Geomagic Studio
  - 3DSSPP, HCBCF, NIOSH Equations,...
  - Lingo
  - SolidWorks
  - MatLab/Simulink
  - CodeVision AVR
  - Proteus
  - Mimics/3D Doctor
  - HyperMesh/Ls-Dyna
  - Microsoft Project (MSP)
  - Ansys Workbench
- **Programming Languages**
  - C/C++
  - Visual Basic
  - MatLab, Maple
  - HTML, CSS

## Work Experience

- Designing and Manufacturing Industrial 2DOF and 3DOF Pick and Place Robots, Kave Sanat Sharif, March 2013-Present.
- Designing and Manufacturing a Deployment Mechanism, ITRC, July 2012-Present.

- A member of Robocup Technical Committee, Amirkabir University of Technology, November 2012.
- Biomechanics Lab Manager, Sharif University of Technology, April 2012-May 2013.
- A member of R&D group, Khakbaz Industries, 2010.
- Project Management Counselor, Omid Company, 2010.
- Physics Teacher, Mofid High School, 2007-2008.

## **Volunteer Experience**

- A member of Iranian Society of Biomedical Engineering (ISBME), 2008-Present.
- Vice President of Students' Council at Amirkabir University, 2007-2009
- Editor of *Sharyan* (a scientific magazine in biomechanics), Amirkabir University, 2009-2010.
- Reporter of *Tapesh* (a scientific magazine in biomedical field), Amirkabir University, 2008-2009.
- Editor of biomechanical section of *BIOEMM.com* (a scientific website), 2008-2010.