Curriculum Vitae

Name: Gholamreza Rouhi
Address (Work): 161 Louis Pasteur, Ottawa, ON, Canada, K1N 6N5; Tel: 1-613-562-5800 ext.: 6268; Fax: 1- 613-562-5174
Address (Home): 34 Carwood Circle, Ottawa, ON, Canada, K1K 4V3
Email: grouhi@uottawa.ca; rouhil@yahoo.com

Educational background:
2006: Ph.D., University of Calgary, Canada
1995: M.A.Sc., Sharif University of Technology, Iran
1991: B.A.Sc., Sharif University of Technology, Iran

Employment history:
2006- Assistant Professor, Department of Mechanical Engineering, University of Ottawa (cross-appointed at the School of Human Kinetics)
2002-06 Associate Coordinator of the Engineering Drop-In Centre (part time), University of Calgary
1995-02 Research Engineer, Mechanical Gyroscopes, Tehran

Papers in refereed journals:

- Rouhi G, Epstein M., Herzog W, Sudak, L, Free surface density & microdamage in the bone remodeling equation: theoretical considerations. *International Journal of Engineering Science, Vol. 44(7): 456-469,* 2006 (ISI, 5-Year Impact Factor= 1.751- this article was ranked 5th in the top 25 hottest articles, 3rd quarter of 2006; ranked 23 in the top 25 hottest articles, 1st quarter of 2007; and ranked 21in the top 25 hottest articles, 2nd quarter of 2007)
- Rouhi G, Epstein M., Sudak, L, Herzog W, Modeling bone resorption using mixture theory with chemical reactions. *Journal of Mechanics of Materials and Structures, 2(6): 1141-1156,* 2007 (ISI, Impact Factor: not available yet)
- Vahdati A and Rouhi G, A model for mechanical adaptation of trabecular bone incorporating cellular accommodation and effects of microdamage and disuse, *Mechanics Research Communications, 36(3), 284-293,* 2009 (ISI, 5-Year Impact Factor: 1.016)
- Saffar KP, Arshi AR, Najafi AR, Jamilpour N, Rouhi G and Sudak L, A cross-linking model for estimating Young's modulus of artificial bone tissue grown on a carbon nanotube scaffold, *Journal of Biomedical Materials Research: Part A* (ISI, Published online on March 2nd 2010, Early View, Impact Factor=?)
- Vahdati A, Rouhi G, Ghalichi F and Tahani M, Mechanically induced trabecular bone remodeling including cellular accommodation effect: a computer simulation, *Transactions of the Canadian Society for Mechanical Engineering*, 32 (3-4) 371-382, 2008 (ISI, Impact Factor= ?)
- Saffar KP, Arshi AR, Najafi AR, Rouhi G and Rafii-Tabar H., Carbon nantotubes applications in bone tissue engineering, *Amirkabir Journal of Science & Technology*, accepted, 2009 (ISC, Impact Factor=?)

- Saffar KP, Jamilpour N, Najafi AR, Rouhi G, Arshi AR and Fereidoon A, A finite element model for estimating Young's modulus of carbon nanotube reinforced composite incorporating elastic cross-links, *Int. J. Mech. Ind. Eng.,* 2(3), 836-839, 2008 (referred 2 times so far in an ISI journal)
- Cere SP, Lormand A, Redekop D and Rouhi G, Simulation of the three-dimensional flow in the human larynx, *Journal of the Canadian Acoustical Association - Journal de l'Association Canadienne d'Acoustique*, *35(3): 1161-117,* 2007
- Rouhi G, Firoozbakhsh K, Epstein M, Herzog W, Sudak L, Free surface density instead of volume fraction in the bone remodeling equation: theoretical considerations. *FORMA, 19(3): 165-182,* 2004 (FORMA is an official scientific periodical of Society for Science on Form, Japan)
- Haase K and Rouhi G, A discussion on plating factors that affect stress shielding using finite element analysis, *Journal of Biomechanical Science and Engineering*, 5(2), 1-13, 2010 (published by The Japan Society of Mechanical Engineers)
- Pishdast H, Farahmand F and Rouhi G, Using a truss-inspired model in combination with the uniform strength optimization theory to predict spongy bone geometry in proximal femur, *American Journal of Applied Sciences, 6(3): 449-455*, 2009 (published in a wrong place!)
- Hooshiar Ahmedi SA, Rouhi G, Katoozian H, Hooshiar Ahmedi SA, Simultaneous effect of growth and remodeling in the bone adaptation theory, *American Journal of Applied Sciences, 6(1): 1816- 1824*, 2009 (published in a wrong place!)

Papers accepted (but subject to revision) by referred journals:

- Li J and Rouhi G, Investigating the effect of non-uniform osteocyte distribution on the spongy bone using a semi-mechanistic bone remodeling theory, remodeling, *Computers in Biology and Medicine* (ISI, Impact Factor= 1.272)
- Rouhi G, Theoretical investigations on bone resorption process: a tri-phasic mixture model, *Journal of Mechanical Behaviour of Biomedical Materials*, (ISI, Impact Factor= not reported yet)
- Ali N and Rouhi G, Barriers to understanding ACL injury mechanisms, *The Open Biomedical Engineering Journal* (Indexed in Pub Med Central)

Papers submitted to refereed journals:

- Bahari MK, Farahmand F, Rouhi G and MR Movahhedy, Using Level Set Method to find an Optimized Shape of Proximal Femur: Considering both Surface and Internal Bone Remodeling (ISI)
- Haase K and Rouhi G, Stress and strain energy density distributions in bone in relation to stress shielding: a retrospective look at the influence of implant geometry and material properties (ISI)
- Ali N, Rouhi G and Robertson GR, Applicability of operation research and artificial intelligence approaches to non-contact anterior cruciate ligament (ACL) injury studies (ISI)
- Lewinson R, Robertson GR and Rouhi G, Work analysis of two snow shovel designs using inverse dynamics and electromyography (ISI)

- Ezoddnin-Ardakani F, Navabazam A, Fatehi F, Danesh-Ardekani M, Khadem S and Rouhi G, Chitosan accelerates bone regeneration in microdrilled rat tibias (ISI)

Papers to be submitted to refereed journals:

- Jamilpour N, Fereidoon A and Rouhi G, The effects of replacing collagen fibers with carbon nanotubes on living functions of bone (to be submitted in May 2010)
- Hooshiar Ahmedi SA, Arshi AR, Rouhi G, Raeisi AR and Katouzian H, An investigation on the effects of low-amplitude, high-frequency (LAHF) mechanical stimuli on matrix- extracellular fluid- osteocyte complex- part I: role of the frequency of the LAHF mechanical stimuli (to be submitted in June 2010)
- Rouhi G and Ezoddini Ardakani F, Osteoporosis: a silent disease and a multidisciplinary problem (an invited article- to be submitted in Sep. 2010)

Papers in refereed conference proceedings:

2010

- N Jamilpour, A Fereidoni and G, On the replacement of collagen fibers with carbon nanotubes in bone tissue: a bio-mechanical approach, ISME 2010, May 11-13, Sharif University of Technology, Tehran (accepted)

2009

- Jamilpour N, Fereidoon A and Rouhi G, Perturbation in bone's living functions caused by replacing collagen fibers with carbon nanotubes, ICBME2009, Tehran, Dec. 30-31, 2009
- Ali N and Rouhi G, Key challenges confronting biomechanist aiming to predict ACL injury mechanisms, The 32nd Conference of the Canadian Medical and Biological Engineering Society (CMBEC32), May 20-22, Calgary, 2009
- Ali N, Robertson GR and Rouhi G, Applicability of operations research and artificial intelligence approaches to non-contact anterior cruciate ligament injury studies, 27th International Conf. on Biomechanics in Sports, University of Lemerick, Ireland, Aug. 17-21, 2009
- PourAkbar Saffar K, JamilPour N, G. Rouhi, Raeisi Najafi A and Sudak L, Fracture toughness of carbon nanotube reinforced artificial bone tissue, *ICF12*, July 12-17, Ottawa, 2009
- PourAkbar Saffar K, JamilPour N, Rouhi G and Sudak L, Functionalized carbon nanotube as a reinforcing scaffold for mineralization of bone tissue: a mechanical model, *ISME 2009*, May 17-19, Tehran, 2009

2008

- Sasal M and Rouhi G, Some investigation on a semi-mechanistic theory of bone remodeling process, CMBEC31, June 11-13, Montreal, QC, 2008
- Haase K and Rouhi G, Finite Element Analysis of Fracture Fixation Techniques: A Parametric Study, CMBEC31, June 11-13, Montreal, QC, 2008

- Sasal M, Rouhi G and Vahdati A, Effect of osteocyte distributions and load directions on bone remodeling process, CSME Forum, June 5-8, Ottawa, ON, 2008
- Haase K and Rouhi G, Finite element analysis of a fracture fixation plate, CSME Forum, June 5-8, Ottawa, ON, 2008
- PourAkbar Saffar K, JamilPour N, Rouhi G, Raeisi Najafi A, and Arshi AR, Prediction of axial Young's modulus of a representative volume element of a tip-functionalized carbon nanotube embedded in bone cement, CCFA-1, Kish, Iran, 2008
- Keivan Bahaary M , Farahmand F, Rouhi G and Movahedi M. Structural optimization of proximal femur using level set method, CSME Forum, June 5-8, Ottawa, ON, 2008
- Motaghinasab S, Hosseini SM, Najarian S and Rouhi G, Evaluation of a new sensorized tactile probe for searching implanted masses by experimental and finite element methods, CSME Forum, June 5-8, Ottawa, ON, 2008
- Hooshiar Ahmedi SA, Rouhi G, Katouzian H, and Hooshiar Ahmedi SAH, A new bone adaptation model: Simultaneous presence of growth and remodeling, ICBME 2008, Shehed University, Tehran, Feb. 13-14, 2008
- Pishdast H and Rouhi G, Predicting proximal femur's geometry using an optimization method of a truss-inspired model, ICBME 2008, Shehed University, Tehran, Feb. 13-14, 2008
- PourAkbar Saffar K, Raeisi Najafi A, Rouhi G, Rafii-Tabar H, and Arshi AR, A Review on Carbon Nanotubes Applications in Bone Tissue Engineering, 1st Conf. on Nanotech. Applications in Sci., Eng., & Med., NTC2008

2007

- Rouhi G, Mechanical, chemical and biological factors in the bone resorption process, *ISME 2007*, Tehran, AKUT, May 15-17, 2007
- Vahdati A, Ghalichi F, Rouhi G, and Tahani M, Computer simulation of trabecular bone remodeling: role of cellular accommodation in time-dependent simulations, 17th International Conference on Computer Methods in Mechanics, Lodz, Poland, June 19-22, 2007
- Vahdati A, Ghalichi F, Rouhi G, Simulation of trabecular bone remodeling including cellular accommodation effect, Proceedings of the 6th Biennial Australian Biomechanics Conference-ABC6, University of Auckland, New Zealand, February 15-17, 2007
- Vahdati A, Rouhi G, Ghalichi F, Tahani M, Computer simulation of a modified mechanistic model for functional adaptation of bone. *ISME 2007*, Tehran, May 15-17, 2007
- Vahdati A, Ghalichi F, Rouhi G, and Tahani M, Mechanically induced trabecular bone remodeling including cellular accommodation effect. *8th HSTAM* International Congress on Mechanics, Patras, July 12-14, 2007

2005

- Rouhi G, Herzog W, Sudak L, Epstein M, Geometric feedback in the bone remodeling equation: theoretical considerations. ISME 2005, Isfahan, Iran, May 17-19, 2005

- Rouhi G, Herzog W, Sudak L, Epstein M, Free surface density & microdamage in the bone remodeling equation: theoretical considerations. ISME 2005, Isfahan, Iran, May 17-19, 2005

1998

- Rouhi G, Firoozbakhsh K, Free surface density instead of volume fraction in the remodeling process of bone, Iranian Conference in Biomedical Engineering , Tehran, UAK, 1998
- Rouhi G, Firoozbakhsh K, Analysis of osteoporosis for the cortical and spongy bones, Iranian Conference in Biomedical Engineering, Tehran, UAK, 1998

Abstracts in refereed conference proceedings:

2010

- Jamilpour N, Fereidoon A and Rouhi G, An investigation into the remodelling process in an artificially-made bone tissue, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Li J and Rouhi G, An investigation into the adaptation of spongy bone incorporating cellular accommodation effect with a 3D computer model, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Walters-Stewart C, Robertson GR and Rouhi G, Biomechanics of the fouette: mechanisms of transfer of angular momentum, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Lewinson R, Robertson GR and Rouhi G, Mechanical work evaluation of two snow shovel designs during non-fatigue trials, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Haase K and Rouhi G, FE analysis of mechanical stimuli transfer between orthopaedic screws and surrounding bone: a possible method for predicting stress shielding in relation to implant geometry and material properties, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Ng KCG, Rouhi G, Lamontagne M and Baule P, An investigation on the biomechanics of femoroacetabular impingement: FEA and bone remodelling theories, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Ali N, Robertson GR and Rouhi G, Postural stability: a new perspective, 16th Biennial Conference for the Canadian Society of Biomechanics, Kingston, ON, June 9-12, 2010 (accepted)
- Ashofte Yazdi A, Sepehri B and Rouhi G, Comparison of the effect of different mechanical properties on the stress analysis of tibia under a transversal impact load using finite element method, 6th World Congress on Biomechanics, Singapore, Augest 1-6, 2010 (accepted)
- Hooshiar Ahmedi SA, Rouhi G, Arshi, AR, Raeisi Najafi A and Katouzian HR, An investigation on the effects of low-amplitude, high-frequency (LAHF)

mechanical stimuli on matrix- extracellular fluid- osteocyte complex, 56th annual meeting of ORS, NO, Louisiana, March 6-9, 2010

2009

- Li J and Rouhi G, Investigating the effect of non-uniform osteocyte distribution on the spongy bone remodeling, The 32nd Conference of the Canadian Medical and Biological Engineering Society (CMBEC32), May 20-22, Calgary, 2009
- Lewinson R, Rouhi G and Robertson GR, EMG comparisons of two types of snow shovels, XXII Congress of the International Society of Biomechanics, Cape Town, South Africa, July 5-9, 2009
- Haase K and Rouhi G, Finite element optimization of plate and screw parameters to reduce stress shielding, 55th Annual Meeting, Orthopaedic Research Society, Feb. 22-25, Los Vegas, Nevada, 2009
- Ng KCG, Rouhi G, Lamontagne M, Baule P and Lee WS, Finite element analysis on the development of cam-type femoroacetabular impingement (FAI) – can bone remodelling theories explain FAI?, CANCAM2009, May 31st - June 4, Halifax, 2009
- Haase K and Rouhi G, A FEA study of orthopaedic screw optimization in an effort to reduce stress shielding, CANCAM2009, May 31st- June 4th, Halifax, 2009

2007

- Rouhi, G, Epstein M and Sudak, L, Modeling bone resorption using mixture theory, CANCAM2007, Toronto, Canada, June 3-7, 2007
- Vahdati A, Rouhi G, Mechanically induced trabecular bone remodeling including cellular accommodation and effects of both microdamage and disuse, ASME (American Society of Mechanical Engineers), Applied Mechanics and Materials Conference, McMAT, University of Texas at Austin, USA, June 3-7, 2007
- Vahdati A, Rouhi G, A trabecular bone remodeling theory incorporating simultaneous effects of disuse and microdamage, CANCAM2007, Toronto, Canada, June 3-7, 2007

2006

- Rouhi G, Herzog W, Sudak L, Epstein M, Modeling bone resorption using mixture theory. Orthopaedic Research Society (ORS 2006), Chicago, March 19 - 22, 2006

2003 to 2005

- Rouhi G, Herzog W, Sudak L, Epstein M, Free surface density but not volume fraction in the bone remodeling equations. CANCAM 2005, Montreal, May 31-June 2, 2005
- Rouhi G, Herzog W, Sudak L, Epstein M, Modeling bone resorption using mixture theory: microcracks factor and calcium concentration. CANCAM 2005, Montreal, May 31-June 2, 2005
- Rouhi G, Epstein M, Sudak L, Herzog W, Bone remodeling theories: single and multi phasic continuum mechanics approaches. 5th Alberta BME Conference (BME 2004), Banff, Canada, October 22-24, 2004

- Rouhi G, Epstein M, Herzog W, Sudak L, Modeling the bone resorption using mixture theory with chemical reactions: theoretical considerations. 5th Combined Meeting of the Orthopedic Research Societies of the USA, Canada, Japan, and Europe, Banff, Canada, October 10-13, 2004
- Rouhi G, Epstein M, Herzog W, Geometric feedback and microcracks factor in the bone remodeling process: Theoretical prediction. 13th Biennial Conference for the Canadian Society of Biomechanics, Halifax, Nova Scotia, August 4–7, 2004
- Rouhi G, Epstein M, Herzog W, Sudak L, Governing equation of bone remodeling process: using mixture theory approach. 13th Biennial Conference for the Canadian Society of Biomechanics, Halifax, Nova Scotia, August 4 –7, 2004
- Rouhi G, Firoozbakhsh K, A new approach for the remodeling process of bone. CANCAM 2003, Calgary, June 2-5, 2003
- Rouhi G, Epstein M, Herzog W, Mechanical stimulus and microcrack in the bone remodeling process: theoretical considerations. 4th Alberta BME Conference (BME 2003), Banff, October 19-21, 2003

Books (these three books are in Farsi):

- Rouhi, G, Pre-University physics 1, fundamental concepts in thermodynamics, vibration. Andishesazan Publication, Iran, 1996 (245 pages)
- Rouhi, G, Pre-University physics 2, fundamental concepts in DC and AC currents; magnetic and electric fields. Andishesazan Publication, Iran, 1998 (424 pages)
- Rouhi, G, Pre-University physics, fundamental concepts in measurement; mechanical and electromagnetic waves and fluid mechanics. Razmand. Pub., Iran, 2000 (309 pages)

Invited book chapter:

- K. PourAkbar Saffar, N. Jamilpour, G. Rouhi, Carbon Nanotubes in Bone Tissue Engineering, Recent Advances in Biomedical Engineering, ISBN 978-953-7619-X-X, by IN-TECH Education and Publishing, Vienna, Austria.

Non-referred contributions:

- Haase K and Rouhi G, Finite Element analysis of a fracture fixation plate: a parametric study, Graduate Studies and Research Day, Feb. 5th, 2008 (poster presentation, winner of the best poster)
- Sasal M, Rouhi G and Vahdati A, Effect of Osteocyte distributions and load conditions on bone remodeling process, Graduate Studies and Research Day, Feb. 5th, 2008 (poster presentation)
- Haase K and Rouhi G, Stress or strain energy density as osteogenesis stimuli? FEA of orthopaedic screws, Graduate Studies and Research Day, Feb. 5th, 2009 (poster presentation)
- Li Jeff and Rouhi G, An investigation on spongy bone remodeling using a semi-mechanistic model, Graduate Studies and Research Day, Feb. 5th, 2009 (poster presentation)

- Ng KCG, Rouhi G, Lamontagne M and Beaule P, Finite element analysis of cam-type femoroacetabular impingement: comparing mechanical stimuli distributions of an impinged joint to a healthy control subject, Graduate Studies and Research Day, Feb. 5th, 2009 (poster presentation- winner of the best poster)
- Li J and Rouhi G, An investigation on the spongy bone remodeling using a semi-mechanistic bone remodeling theory, ASM poster competition, Carleton University, Feb. 24th, 2009 (poster presentation- winner of the Best Graduate Poster)
- Walters-Stewart C, Robertson GR and Rouhi G, An investigation into the mechanisms of transfer of angular momentum, Graduate Studies and Research Day, Feb. 4th, 2010 (poster presentation- ranked as the 3rd best poster)

Scholarly and professional academic activities:

- Editorial Board Member of:
  - The open Biomedical Engineering Journal
  - Transactions of the Canadian Society for Mechanical Engineering
  - International Journal of Non-linear Dynamics in Engineering and Sciences
  - International Journal of Applied Artificial Intelligence in Engineering System

- Refereeing for the following scientific journals:
  - Computers in Biology and Medicine (ISI, IF= 1.272)
  - Mechanics Research Communication (ISI, IF= 1.016)
  - Journal of Biomedical Materials Research: Part A (ISI, IF=?)
  - Journal of Mechanics of Materials and Structures (ISI, IF=?)
  - International Journal of Engineering
  - The open Biomedical Engineering Journal

Current students:

- Jeffery XianJie Li (MASc student), Bone – implant interaction: stress-shielding and bone remodeling theory, Jan. 2008- Aug. 2010 (expected)
- Kwan-Ching Geoffrey Ng (MASc student), Hip impingement, bone remodeling and optimal bone configuration (co-supervised with Prof. M. Lamontagne), Sep. 2007- Aug. 2010 (expected)
- Coren Walters-Stewart (MASc student), Finite Element Analysis of bone sensor cells (osteocytes) deformation, Sep. 2007- Aug. 2010 (expected)- (co-supervised with Prof. GR Robertson)
- Nicholas Ali (PhD student), Use of Musculoskeletal Finite Element Modeling to Investigate the Role of Musculotendon actuators in enabling the stability and integrity of the human knee joint during Non Contact incidences, School of Human Kinetics, University of Ottawa, Sep. 2007-…(co-supervised with Prof. G. Robertson)
- Nima Jamilpour (MASc student), Is artificial bone made by CNTs and colagen fibers a suitable choice from bone remodleing point of view?, University of

Semnan, April 2008- June 2010 (expected)- (co-supervised with Prof. A. Fereidoon)
- Behnoud Haghighi (MASc student), Finite element analysis of orthopaedics screws by considering bone remodelling process: investigating the stress shielding effects, Ferdowsi University of Mashhad, April 2010-... (co-supervised with Prof. M. Tahani)

Alumni:

- Kristina Haase (MASc student), FEA of Orthopaedic Plates & Screws to Reduce the Effects of Stress Shielding, Jan. 2007- Dec. 2009 (main supervisor, presently PhD student in Physics at U of Ottawa)
- Kaveh Pouakbar (MASc student), Carbon nanotubes in bone tissue engineering, Sep. 2007- July 2008, Amirkabir University of Technology, co-advised with Prof. AR Arshi (currently PhD student at the U of Calgary)
- Ali Vahdati, Numerical analysis of trabecular bone remodeling including cellular accommodation effect, Sep. 2004- May 2007, Sahand University of Technology, Iran (co-supervised with Prof. F. Ghalichi- presently PhD student at U of Notre Dame).
- Mahsa Keivan Bahari (MASc student), Structural optimization of proximal femur using level set method, Sep. 2007- Feb. 2009 (Sharif University of Technology, co-advised with Prof. F. Farahmand)
- Seyyed Amir Hooshiar Ahmedi (MASc student), Investigating the effects of vibration on bone sensor cells deformation: from cells to molecules, Sep. 2007- Sep. 2009 (Amirkabir University of Technology, co-advised with Prof. AR Arshi- currently PhD student at AKUT)
- Ryan Lewnison (BSc student), Biomechanics of snow shovelling, School of Human Kinetics, University of Ottawa, 2008-2009 (co-supervised with Prof. G. Robertson)
- Mohsen Keshvarzian (BSc student), Finite volume analysis of micturition flow, Amir Kabir University of Technology- 2007-2008 (co-supervised with Prof. R Hosseini)

Courses taught:

- Statics,
- Dynamics,
- Engineering materials,
- Biological and Engineering materials,
- Design of Artificial Joint Prostheses and Implants,
- Biomechanics,
- Mechanics of Materials,
- Engineering analysis and modelling of human anatomy and physiology