

Curriculum Vitae

Yasin Y. Dhafer

Director of the Searle Center for the Science of Walking
Director of the Neuromechanics Laboratory
Assistant Professor,
Department of Biomedical Engineering
McCormick School of Engineering
Research Assistant Professor,
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Northwestern University
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Education

1997-1999	Systems Neurophysiology, Post Doctoral Fellowship Northwestern University and the Rehabilitation Institute of Chicago
1991-1997	Theoretical Mechanics/Biomechanics, Ph.D. Michigan State University, East Lansing, Michigan
1987-1990	Mechanical Engineering/Applied Mechanics, M.S. (Highest Distinction) Jordan University of Science and Technology, Irbid, Jordan
1983-1987	Mechanical Engineering, B.S. (Highest Distinction) Yarmouk University, Irbid, Jordan

Academic Experience

1999-present	Research Assistant Professor, Physical Medicine and Rehabilitation Northwestern University, Evanston and Chicago, Illinois
10/04-present	Assistant Professor, Biomedical Engineering Northwestern University, Chicago, IL
1997-present	Research Scientist, Sensory Motor Performance Program The Rehabilitation Institute of Chicago, Chicago, Illinois
04/06-present	Adjunct Professor, Biomedical Engineering Illinois Institute of Technology, Chicago, IL
1992-97	Instructor/Research Assistant, Department of Material Sciences and Mechanics Michigan State University, East Lansing, Michigan
1988-90	Teaching Assistant, Mechanical Engineering Jordan University of Science and Technology University, Irbid, Jordan

Industry Experience

2006-present	USA-Department of Defense subcontractor
2002-2006	EMPhotonics Inc., Newark, Delaware Engineering Mechanics and Biomechanics Consultant
1998-present	Law office of Sidney Ezra, Chicago, Illinois Biomechanics Expert
1992-96	Solira Laboratories In., Okemos, Michigan Biomechanics Consultant
1996	Prentice Hall, Upper Saddle River, New Jersey

Engineering Mechanics Consultant

Honors and Awards

- 2007 Selected as a Fellow of the Northwestern Center for Engineering Education Research (NCEER)
- Post-doctoral**
- 2001 Excellence in Neural Engineering Travel Award, IEEE Engineering in Medicine and Biology Society and National Science Foundation
- 1999 Baskin Award for Excellence in Research, the Rehabilitation Institute of Chicago
- 1997-1999 Falk Research Fellow at the Rehabilitation Institute of Chicago
- Pre-doctoral**
- 1994, 1995 Graduate Student Fellowship for Academic Excellence, Material Sciences and Mechanics Department, Michigan State University
- 1987 Royal Honor Award for Distinguished Academic Achievement, the King of Jordan
- 1987 University Distinguished Academic Achievement Award, Yarmouk University, Irbid, Jordan
- 1983-87 College of Engineering Dean's Honors list, Yarmouk University, Irbid, Jordan

Teaching Experience

- 2006, 07, 08 *Mechanics of Biological Tissues: A Hyperelastic Approach*, Biomedical Engineering Department, Northwestern University, Evanston, IL
- 2006, 07 *Special Topics in Biomedical Engineering: **Design of Biomedical Technologies for the Underserved and Poor Communities***, Biomedical Engineering Department, Northwestern University, Evanston, IL
- 2004 *Engineering Analysis*, Mechanical Engineering Department, Northwestern University, Evanston, IL
- 2002 *Introduction to Biomechanics*, Biomedical Engineering Department, Northwestern University, Evanston, IL
- 2001 *Motor Control* (W.Z. Rymer class coordinator), Biomedical Engineering Department, Northwestern University, Evanston, IL
- 1994-96 *Mechanics of Materials*, Material Sciences and Mechanics Department, Michigan State University, East Lansing, MI
- 1993-96 *Biomechanics of Human Movement*, Biodynamics & Biomechanics Evaluation Laboratories, College of Engineering, Michigan State University, East Lansing, MI
- 1996 *Experimental Mechanics Laboratory*, Material Sciences and Mechanics Department, Michigan State University, East Lansing, MI
- 1988-90 *Theory of Instrumentation Laboratory*, Mechanical Engineering Department, Jordan University of Science and Technology University, Irbid, Jordan
- 1988-90 *Theory of Machinery & Control Theory* (Teaching Assistant), Mechanical Engineering Department Jordan University of Science and Technology University, Irbid, Jordan

Academic Proficiency

Vibrations, Theory and Application (Linear and Nonlinear)
Control, Theory and Applications (Algebraic and geometric (H_∞))
Solid Mechanics (Elasticity & Continuum Mechanics)

System Synthesis (Optimization & System Identification)
Tissue Mechanics (Computational)

University / Institutional Service

1998 Scientific Seminars Organizer, Sensory Motor Performance Program, The Rehabilitation Institute of Chicago

2002-2006 Baskin Awards Committee

2003-2006 Executive Committee, Physical Medicine and Rehabilitation Department
Northwestern University

2003-2006 Medical Faculty Senate Committee, Medical School, Northwestern University

2003-present Graduate students defense committees

2007-present Biomechanics Core, Curriculum Coordinator at the Biomedical Engineering Department, Northwestern University

2007-present PhD admission committee at the Biomedical Engineering Department, Northwestern University

Grant Review Service

2000 Arkansas Science & Technology Authority

2002 Center for Medical Rehabilitation Research: NCMRR-NIH Midwest Regional Center

2006-present The Defense Advanced Research Projects Agency (DARPA), Department of Defense

2006-present Special Emphasis Panel, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), NIH, Department of Health and Human Services

Paper Review Service

2004, 07 American Society of Biomechanics Annual Meetings

2005 The 9th International Conference on Rehabilitation Robotics, Chicago, Illinois, June 28 - July 1, 2005

1998, 99 The International Conferences on Medical Image Computing and Computer Assisted Interventions (MICCAI)

Journal of Applied Biomechanics
Journal of Biomechanics
Annals of Biomedical Engineering
IEEE Transactions on Biomedical Engineering
Journal of Neurophysiology
Experimental Brain Research
Journal of Biomechanical Engineering

National and International Service

2002 Co-Chair of the *Musculoskeletal Modeling* Session at the 2nd Joint EMBS-BMES Conference, 23-26 Oct. 2002, Houston Texas.

2003 Co-Chair of the *Reflexes and Motor Control* Session at the 25th Annual international conference of the IEEE engineering in medicine and biology society, 17-21 Sep. 2003, Cancun, Mexico.

2004 Co-Chair of a Symposium on *Joint Neuromechanics* at the American Biomechanics Society Annual Meeting, 8 – 11 Sep. 2004, Portland Oregon.

- 2005 Primary Mentor, 3^{ed} Annual Workshop on Grant Writing, Enhancing Rehabilitation Research in the South (ERRIS), 19-23 Jan. 2005, Charlottesville, Virginia
- 2005 Scientific Review Co-Chair, *9th International Conference on Rehabilitation Robotics* in Chicago Illinois (June 28 - July 1).
- 2006 Chair of a Mini-Symposium on *Computational Mechanics of the Human Musculoskeletal System*, at the 7th World Congress on Computational Mechanics, 16 – 22 July, 2006, Los Angeles, California.
- 2006-present **Associate Editor**, *IEEE Transaction on Biomedical Engineering*
- 2007 Chair of a Mini-Symposium on *Computational Mechanics of the Human Musculoskeletal System*, at the 9th US National Congress on Computational Mechanics, 22 – 26 July, 2007, Berkeley, California.
- 2007 Advisory Committee, *10th International Conference on Rehabilitation Robotics*, Netherlands (June 13-15).
- 2007 Program Committee, *American Society of Biomechanics Meeting*, Stanford University, California (August 23-5)
- 2008 Program Committee, The second IEEE RAS / EMBS *International Conference on Biomedical Robotics and Biomechatronics – BioRob 2008*, Scottsdale, Arizona (October 19-22)
- 2008 Program Committee, *North American Congress on Biomechanics (NACOB)* meeting 2008, Ann Arbor, Michigan (August 5-9).

Sponsored Research

Research Grant Awards (active and completed)

Title: Reflex Contribution to Joint Stability

Role: Principal Investigator

Date: 9/30/04 – 8/31/09

Funding: \$250,000/year

Source of support: NIH-NIAMSD (1-R01-AR049837-01)

Title: Engineering for Neurologic Rehabilitation

Role: Co-Director of the Robotics/Mechanics Core (PI: WILLIAM Z Rymer)

Date: 9/1/05 – 8/31/10

Funding: ~\$700,000/year

Source of support: NIH-NCMRR (R24HD050821)

Title: Machines Assisting Recovery from Stroke Rehabilitation Engineering

Research Center (Center PI: WILLIAM Z Rymer)

Subproject Title: Cooperative Control Strategies for Robot-Aided Gait Therapy

Role: Co-PI with Robert Riener, ETH, Switzerland

Funding: \$150,000/year

Source of support: NIDRR-RERC (U.S. ED; H133E070013)

Date: 10/1/07 - 9/30/12

Title: Gait abnormalities in individuals with stroke: Implications to rehabilitation

Role: Principal Investigator

Date: 10/1/04 – 10/1/07

Funding: \$125,000/year

Source of support: NIDRR-Field Initiated Study (U.S. ED)

Title: System Identification of Periarticular Reflexes and their Impact on Knee Joint Mechanics

Role: Principal Investigator

Date: 9/1/02 – 8/31/05
Funding: \$80,000/year
Source of support: Whitaker Foundation

Title: Role of Joint Afferents in Knee Media-Lateral Stability
Role: Principal Investigator
Date: 9/01/99 – 8/31/02 (no cost extended till 8/31/03)
Funding: \$70,000/year
Source of support: NIH-NIAMSD (1 R03 AR46422-01)

Title: Joint Mechanoreceptor Contributions to the Control of Knee Stability: Implications for Osteoarthritis
Role: Co-Principal Investigator (Co-PI: W. Z. Rymer)
Date: 12/01/99 – 11/30/01
Funding: \$53,466 /year
Source of support: NIH-NIAMSD, Subcontract to Northwestern University (5 P60 AR30692-17)

Title: Postural Stabilization and Visual Orientation in the Elderly
Role: Co-Investigator (PI: Emily Keshner)
Date: 1999-2003
Funding: \$272,580/year
Source of support: NIH National Institute on Aging (1 R01 AG16359-01A1)

Title: Cortical Activity Related to Isometric Joint Torques
Role: Co-Investigator (PI: Julius Dewald)
Date: 2001 – 2003
Funding: \$63,500/year
Source of support: NIH-NICHHD (1 R03 HD39804-01)

Title: The Effect of Neural Constraints on Movement in Stroke
Role: Co-Investigator (PI: Julius Dewald)
Date: 2000 – 2005
Funding: \$267,408/year
Source of support: NIH-NICHHD (1 R01 HD39343-01)

Title: Regulatory Mechanisms Underlying Postural Stability
Role: Co-Investigator (PI: Emily Keshner)
Date: 12/01/01-11/30/04
Funding: \$250,000/year
Source of support: NIH-NIDCD (R01 DC11025)

Title: Fiber Optical Micro-Sensor for Measuring Tendon Forces
Role: Co-Investigator (PI: Gregory Behrmann)
Date: 02 – 03
Source of support: NIH-NICHHD (Phase 1 SBIR)

Pending Research Grants

Title: The association between impairments and activity post stroke: a cross-sectional and longitudinal analysis
Role: Principal Investigator
Source of support: NIDRR-Field Initiated Study (U.S. ED)
Status: In review

Title: Collaborative Research: Multidomain Computational Framework for Predicting Musculoskeletal Intervention Outcomes
Role: Principal Investigator (Co-PI; Dr. Negrut, University of Wisconsin)
Source of support: NSF-NICHHD
Status: In review

Title: Computational framework for multi-scale musculoskeletal, simulations and analysis
Source of support: NIH
Mechanism: RO1
Role: Principal Investigator (Co-PI; Dr. Darryl Thalen)
Status: In review

In Preparation Research Grants

Title: Neuromechanical Substrates for Post Stroke Asymmetric Gait
Funding Source: NIH
Mechanism: RO1
Role: Principal Investigator
Collaborators: Randy Beer and Matt Tresch
Tentative Submission Date: February 2008

Title: Neural substrates in the human knee ligaments: Spatial mapping and biomechanical correlates
Funding Source: NIH
Mechanism: R21
Role: Principal Investigator
Collaborators: Paul Marasco and CJ Heckman
Tentative Submission Date: June 2008

Mentored (or Co-Mentored) Research Grant Awards

Title: Role of Hip Impairments on Functional Outcome Following Stroke
Role: Mentor (PI: Michael Lewek; Postdoctoral Fellow)
Date: 7/1/05- 6/30/07
Funding: \$47,000/year
Source of support: American Heart Association (0525767Z)

Title: Hip Angle and Limb Load Affect Reflexes Post-Stroke
Role: Mentor (PI: Michael Lewek; Postdoctoral Fellow)
Date: 7/1/06 - 1/1/08
Funding: \$39,000/year
Source of Support: National Institutes of Health - NRSA Individual Postdoctoral Fellowship

Title: Co-contraction Muscle Synergies in Chronic Stroke Subjects: Influence on Circumduction
Role: Mentor (PI: Theresa Hayes; Predoctoral Fellow)
Status: 1/1/06- 12/31/07
Source of support: American Heart Association (0515527Z)

Title: Investigating the effects of torque synergies on post-stroke gait abnormalities
Role: Mentor (PI: Betsy Hunter; Predoctoral Fellow)
Status: 1/1/08- 12/31/09
Source of support: American Heart Association (0810115Z)

Title: Altered neural templates post-stroke: Associating fundamental factors from isometric tasks and functional gait
Role: Mentor (PI: Theresa Hayes Cruz; Predoctoral Fellow)
Status: 1/1/08- 12/31/08
Source of support: American Heart Association (0810161Z)

Collaborators (outside my institution)

George Hornby, Ph.D., PT Department of Physical Therapy, University of Illinois-Chicago

Robert Kenyon, Ph.D. Electrical and Computer Engineering, University of Illinois-Chicago

Darryl Thelen, Ph.D.	Mechanical Engineering, <u>University of Wisconsin-Madison</u> , WI
Emily Keshner, Ed.D., P.T.	Department of Physical Therapy, College of Health Professions, <u>Temple University</u> , Philadelphia, PA
Kamran Iqbal, Ph.D.	Department of Systems Engineering, <u>University of Arkansas</u> at Little Rock, Little Rock, AR
Dan Negrut, Ph.D.	Mechanical Engineering, <u>University of Wisconsin-Madison</u> , WI
Peter Z. G. Qian, Ph.D.	Department of Statistics, <u>University of Wisconsin-Madison</u> , WI
Robert Riener, Ph.D.	Department of Mechanical and Process Engineering, <u>ETH</u> , Switzerland

Undergraduate Students

Alfred Shukri	Biomedical Engineering, Northwestern University, Evanston, IL- Expected to graduate in 2008.
Alex Albertini	Biomedical Engineering, Northwestern University, Evanston, IL- Graduated in 2005.
Mathew Francis	Biomedical Engineering, Northwestern University, Evanston, IL- Graduated in 2005.

Graduate Students (past and present)

Antonio Ricamato	Ph.D. (co-advisor) GE Medical, Hoffman State, Graduated 2000.
Anastasios Tsoumanis	Ph.D. Candidate, Biomedical Engineering, Illinois Institute of Technology Chicago, IL- Expected to graduate in 2008.
James Finley	Ph.D. Candidate, (co-advisor), Biomedical Engineering, Northwestern University, Evanston, IL- Expected to graduate in 2009
Theresa Hayes	Ph.D. Candidate, Biomedical Engineering, Northwestern University, Evanston, IL- Expect to graduate in 2008.
Martha Loehr	Ph.D. Candidate, Biomedical Engineering, Northwestern University, Evanston, IL- Expected to graduate in 2008.
Rafael Connemara	M.Sc. Biomedical Engineering, Northwestern University, Evanston, IL- Graduated in 2006, pursuing a physician assistant degree.
Betsy Hunter	Ph.D. Candidate, Biomedical Engineering, Northwestern University, Evanston, IL- Expected to graduate in 2009.
Megan Barry	M.Sc. Student, Biomedical Engineering, Northwestern University, Evanston, IL.-Expected to graduate in 2008.
Jon Durant	M.Sc. Student, Biomedical Engineering, Northwestern University, Evanston, IL.

Post-Doctoral Mentee (past and present)

Seneh Gurses	2002-2005, Assistant Professor, Department of Engineering Science, Middle East Technical University, Ankara, Turkey
Michael Lewek	2003-2006, Assistant Professor, Physical Therapy Program, University of North Carolina, NC, USA
Jeff Nessler	2005-2006, Assistant Professor, Department Of Kinesiology, California State Polytechnic University, Pomona, CA, USA
Qunli Sun	2005-2007
Preeti Nair	2008-present

Contribution to Edited Work

Dhafer Y. Muscle Imaging Techniques. *Encyclopedic Reference of Neuroscience*, Edited by U. Windhorst, M. Binder and N. Hirokawa, to appear in 2008.

Publications in Refereed Journals

Finley JM, Perreault EJ, Dhafer Y. Heteronymous Reflex Contributions to Circumduction in Stroke (Accepted for Publication in *Experimental Brain Research*; 2008).

Loehr, M. Dhafer, Y. The differential effects of gender, anthropometry, and prior hormonal state on frontal plane knee joint stiffness. (Accepted for Publication in *Journal of Clinical Biomechanics*; 2008).

Keshner, E. and Dhafer Y. Characterizing Head Motion in 3 Planes during Combined Visual and Base of Support Disturbances in Healthy and Visually Sensitive Subjects. (In print: *Gait and Posture*; 2008)

Hayes, T. and Dhafer, Y. Evidence of torque synergies in the lower extremities after stroke. *Stroke*, 39(1): pp.139-147, 2008.

Hernandez A, Dhafer Y. Thelen D. In vivo measurement of dynamic muscle function at postures representative of early swing phase. *Journal of Biomechanics*, 41(1): pp. 137-144, 2008.

Lewek MD, Hornby TG, Dhafer Y., Schmit BD, Prolonged Quadriceps Activity Following Imposed Hip Extension : A Neurophysiological Mechanism for Stiff-Knee Gait. *Journal of Neurophysiology*, 98(6): pp. 3153-3162, 2007.

Keshner, E; Dhafer Y., Streepey J. W., Hain T., Pairing virtual reality with dynamic posturography serves to differentiate between patients experiencing visual vertigo. *Journal of NeuroEngineering and Rehabilitation*, 9; pp. 4:24. 2007.

Lewek MD, Schmit BD, Hornby TG, Dhafer Y. Hip joint position modulates volitional knee extensor muscle activity post-stroke. *Muscle and Nerve* vol. 34 (6), Published on line September, 2006.

Dhafer, Y. and Francis M. Determination of the varus-valgus axis of rotation at the human knee: A helical axis representation, *Journal of Orthopaedic Research*, vol. 25 (1), Published on line December, 2006.

Dhafer Y.Y., Tsoumanis A.D., Houle T.T., and Rymer W.Z. Neuromuscular reflexes contribute to knee stiffness during valgus loading. *J Neurophysiology* Vol. 93(5), pp. 2698-709, 2005.

Gurses, S., Dhafer Y.* , Hain, T. C. and Keshner, E. A. Perturbation Parameters Associated with Nonlinear Responses of the Head at Small Amplitudes. (*Chaos*, 2005; * corresponding Author).

Keshner, E; Kenyon R., Dhafer Y., Streepey J. W. Employing a virtual environment in postural research and rehabilitation to reveal the impact of visual information. *International Journal on Disability and Human Development*, vol 3(3), July-September, pp. 177-182, 2005.

Ricamato, A. and Dhafer, Y. Electrical Cortical Activity Associated with Joint Torque Direction in the Human Arm, *J. Clinical Neurophys.* vol. 21(3), pp.192-208, 2004.

Dhafer, Y. Joint-afferent-mediated muscle activations yield a near-maximum torque response of the quadriceps, *Journal of Neuroscience Methods*, vol. 133, pp. 1–17, 2004.

Ricamato, A., Dhafer, Y., and Dewald, JPA. Electrical cortical activity associated with joint torque direction in the human arm, *J. Clinical Neurophys.* Vol. 20(5): pp. 326–344, 2003.

Dhafer, Y., Tsoumanis, A.D. and Rymer, W.Z. Reflex Muscle Contractions Can Be Elicited By Valgus Positional Perturbations of the Human Knee, *Journal of Biomechanics*, vol. 36, pp. 199-209, 2003.

Dhafer, Y. and Kahn, L. The impact of vastus medialis forces on patello-femoral contact: A model-based study, *Biomech. Eng. Trans. ASME*, vol. 127, pp.758-767, 2002.

Dhafer, Y. Computation of a stabilizing set of feedback matrices of a Large-Scale Nonlinear Musculoskeletal Dynamic Model. *Computer Methods in Biomechanics and Biomedical Engineering*, vol. 4, pp. 93-188, 2001.

Dhafer, Y. Delp, S. and Rymer, W. Z. The use of basis function in modeling joint articular surfaces: Application to the knee joint. *Journal of Biomechanics*, vol. 33, pp. 901-907, 2000.

Schmit, B. D. Dhafer, Y. Dewald J. and Rymer, W. Z. The linearity of the stretch receptors to large amplitude, constant velocity movements in spastic elbow: Implications for the quantification of spasticity. *The Annals of Biomedical Engineering*, vol. 27, pp. 815-829, 1999.

Soutas-Little, R.W. Hillmer, K.M. Hwang, J.C. Dhafer, Y.Y. Role of ground reaction torque and other dynamic measures in postural stability. *Engineering in Medicine and Biology Magazine, IEEE*, vol. 11 (4), pp. 28-31, 1992.

Khader N. and Dhafer, Y. An aeroelastic stability study for a wing-pylon-tilt rotor system in hover. *Trans. Cand. Soc. Mech. Eng.*, vol. 22, pp. 103-126, 1998. (From M.Sc. Thesis)

Refereed Journal Articles in Review

Tsoumanis, A.D. and Dhafer, Y. Effect of load bearing on the knee joint intrinsic valgus stiffness, (*Journal of Clinical Biomechanics*; 2007).

Roth H.R., Moore J.L., Hornby T.G., Dhafer Y., Lewek M.D., Development and Validation of the Circumduction Assessment Scale for Hemiparesis, (*Journal of Neurological Physical Therapy*, 2007)

Lewek M.D., Hayes T., Moore J.L., Roth H.R., Dhafer Y., Hornby T.G., Alterations in Joint Kinematics Following Locomotor Training in Individuals with Chronic Stroke, (*Archives of Physical Medicine and Rehabilitation*, 2007)

Refereed Journal Articles in Preparation

Loehr, M. Dhafer, Y. Gender-specific motor template in response to valgus perturbation at the human knee, (*J. Biomechanics*; *Projected submission date is March 2008*).

Hunter B., Thelen D. Dhafer Y. Experimental evaluation of model-based lower extremity induced accelerations, (*J. Biomechanics*; *Projected submission date is March 2008*).

Dhafer Y.Y. Qun, L. Barry M. Qian Z. G. (Peter) A Finite Element Model of the Knee: A Bayesian Parametric Sensitivity Investigation, (*J. Biomech. Eng. Trans. ASME*; *Projected submission date is February 2008*).

Dhafer Y.Y. Qun, L. Barry M. Spatial characteristics of soft tissue loading during the load acceptance phase of gait, (*J. Biomechanics*; *Projected submission date is February 2008*).

Connemara, R.D., Loehr, M. Dhafer, Y. Neural substrates in the feline knee ligaments: Ultrastructure and Spatial Mapping, (*Journal of Anatomy*; *Projected submission date is May 2008*).

Tsoumanis, A.D. and Dhafer, Y. Valgus induce muscle contractions regulates joint stiffness under load bearing states, (*J. Biomechanics*; *Projected submission date is April 2008*).

Peer Reviewed Proceeding Articles (2 – 4 pages)

Cammarata M, DeMott T, Dhafer Y. Evidence of gender specific motor templates to resist a valgus perturbation at the knee. *American Society of Biomechanics Conference*, Aug 22-25, 2007. Palo Alto, CA
(Won the *Clinical Biomechanics Award*)

Hunter B, Thelen D., Dhafer Y. Experimental evaluation of model-based lower extremity induced accelerations. *American Society of Biomechanics Conference*, August 22-25, 2007. Palo Alto, CA

Hayes, T. and Dhafer, Y. Torque coupling post stroke: implication for gait. *American Society of Biomechanics Conference*, August 22-25, 2007. Palo Alto, CA

Finley JM, Perreault EJ, Dhafer Y. Enhanced Inter-Joint Reflex Coupling May Contribute to Impaired Coordination in Hemiparetic Stroke. *American Society of Biomechanics Conference*, August 22-25, 2007. Palo Alto, CA

Cammarata M, DeMott T, Dhafer Y. Frontal plane knee joint stiffness: gender and hormonal effects. *American Society of Biomechanics Conference*, Aug 22-25, 2007. Palo Alto, CA

Nessler J., Lin W., Dhafer Y. Synergistic Moments at the Hip and Knee Joints Are Altered In Post-Stroke Hemiplegic Gait. *ASME 2007 Summer Bioengineering Conference*, June 20 - 24, Keystone, CO, 2007

Hernandez A, Dhafer Y. Thelen D. Rectus Femoris can Induce Hip Extension at Postures Representative of the Early Swing Phase of Walking. *Gait and Clinical Movement Analysis Society 12th Annual Meeting*, April 11-14, 2007, Springfield, MA

Cammarata M, DeMott T, Moore J, Tsoumanis A, Dhafer Y. Effect of gender and oral contraceptive use on frontal plane knee joint stiffness: A pilot study. *American Society of Biomechanics Conference*, September 6-9, 2006. Blacksburg, VA

Tsoumanis A, Dhafer Y. In Vivo Examination of Knee Varus/Valgus Stiffness: The Effect of Weight Bearing. *American Society of Biomechanics Conference*, September 6-9, 2006. Blacksburg, VA

Hernandez A, Dhafer Y. Thelen D. Measurement of Muscle Induced Motion and Torques at Postures Seen During the Swing Phase of Gait. *American Society of Biomechanics Conference*, September 6-9, 2006. Blacksburg, VA

Keshner, E, Kenyon R., Dhafer Y., Streepey J. W. Employing a virtual environment in postural research and rehabilitation to reveal the impact of visual information. Proc. 5th Intl Conf. Disability, Virtual Reality & Assoc. Tech., Oxford, UK, September 20-22, 2004

Keshner, E, Kenyon R., Dhafer Y. Postural research and rehabilitation in an immersive environment. *Proceedings of the 26th Annual International Conference of the IEEE EMBS* San Francisco, September 1-5, 2004

Keshner, E.A., Kenyon, R.V., and Dhafer, Y. Impact of visual information on posture is influenced by other sensory inputs. Proceedings of the International Society of Electrophysiology and Kinesiology (ISEK), Boston, June 18-21, 2004.

Albertini A. E. and Dhafer Y. The role of the vastus medialis and vastus lateralis in medial-lateral knee joint stability. *American Society of Biomechanics*, September 8-11, 2004, Portland, Oregon.

Dhafer, Y., Tsoumanis, A.D. and Rymer, W.Z. Periarticular reflexes contribute to joint stiffness during valgus loading at the knee. 25th Annual international conference of the IEEE engineering in medicine and biology society, 17-21 September, 2003, Cancun, Mexico

Dhafer, Y., Tsoumanis, A.D. Deloria-Knoll M., and Rymer, W.Z. Neuromuscular reflexes can stabilize the knee during valgus loading, American Society of Biomechanics, September 25-27, 2003, Toledo, Ohio.

Tsoumanis, A.D., Dhafer, Y., and Rymer, W.Z. Reflex responses to the medial knee ligament loading: Effect of Hip angle change, American Society of Biomechanics, September 25-27, 2003, Toledo, Ohio.

Dhafer, Y., Tsoumanis, A.D. and Rymer, W.Z. Reflex responses to loading of periarticular tissue at the human knee- potential roles in joint stabilization, 4th Australasian Biomechanics Conference, November 28-30, 2002, La Trobe University, Melbourne, Australia.

Dhafer, Y. Monte Carlo-based musculoskeletal modeling suggests passive tissue afferents have optimal role in promoting knee stability, *Invited, Proceedings of the 2nd Joint EMBS-BMES Conference*, October 23-26, 2002, Houston Texas.

Dhafer, Y., Tsoumanis, A.D. and Rymer, W.Z. Reflex responses to the medial knee ligament loading: Effect of Hip angle change, *Proceedings of the 4th World Congress of Biomechanics*, August 4 - 9th, 2002.

Dhafer, Y. and Kahn L. Is action of the medial quadriceps alone adequate to stabilize the knee against valgus loads? *Proceedings of the 4th World Congress of Biomechanics*, August 4 - 9th, 2002.

Dhafer, Y., Tsoumanis, A.D. and Rymer, W.Z. Reflex responses to ligament loading: Implication for knee joint stability, *Proceedings, 23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Istanbul, Turkey, 2001.

Ricamato, A., Dhafer, Y., & Dewald, JPA. Quantitative measure of cortical activity of upper limb torque generation, *The World Congress on Medical Physics and Biomedical Engineering*, Chicago, IL, 2000.

Conference Abstracts

Sun Q., Dhafer Y., Moran, B., Tang H. Finite Element Modeling of the Human Knee: A Study of Hyperelastic Parameters of Knee Soft Constraint. The 9th US National Congress on Computational Mechanics, 22 – 26 July, 2007, Berkeley, CA

Lewek MD, Schmit BD, Hornby TG, Dhafer YY. The Role of Hip Movement on Quadriceps Activity and its Influence on Stiff-Legged Gait Post-Stroke. *Society for Neuroscience Annual Meeting*, Atlanta, GA, October, 2006.

Dhafer Y and Hunter B. Muscle function: experimental evaluation of model predictions. *BMES 2006 Annual Meeting*, October 11-14, Chicago, IL 2006

Tsoumanis, A and Dhafer Y The effect of weight bearing on knee varus/valgus stiffness. *BMES 2006 Annual Meeting*, October 11-14, Chicago, IL 2006

Hayes T, Patton P, Dhafer Y. Evidence for restricted control options in the lower extremity of stroke subjects. *Society for Neuroscience Annual Meeting*, Atlanta, GA, October, 2006.

Hayes T and Dhafer Y. Altered neural outflow of the lower limb following stroke. *BMES 2006 Annual Meeting*, October 11-14, Chicago, IL 2006

Dhafer Y. and Sun Q. Three-dimensional Hyperelastic Model of the Human Knee: A Parametric Sensitivity Study. *7th World Congress on Computational Mechanics*, Los Angeles, California, July 16-22, 2006

Gordon KE, Wu M, Dhafer Y, Schmit BD Enhanced Sensory Feedback to Improve Locomotor Coordination following Spinal Cord Injury. *Dynamic Walking*, May 4-8, Ann Arbor, MI, 2006.

Hayes, T and Dhafer Y Torque Constraints for the Modeling of Pathological Gait. *Dynamic Walking*, May 4-8, Ann Arbor, MI, 2006.

Lewek, M.D., Schmit, B.D., Hornby, T.G., Dhafer, Y.Y. Hip Joint Position Affects Knee Extensor Activity Post-Stroke. *APTA-CSM*, February 2006

Roth H.R., Moore J.L., Lewek M.D., Hornby T.G., Dhafer Y.Y. Development and Validation of Circumduction Assessment Scale for Individuals with Hemiplegia. *APTA-CSM*, February 2006

Connemara R, Loehr M, Ballou E, Dhafer Y. Differential Distribution of Mechanoreceptors in Periarticular Structures of the Cat Knee. *International Symposium On Ligaments & Tendons – VI*, March 18, 2006, *Chicago, IL*

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Reflex responses to ligament loading: Implications for knee joint stability. Presented at the Texas Medical Center, The University of Texas Houston Medical School, Department of Orthopaedics, Houston, USA, May, 2002.

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Neuro-sensory role of joint periarticular tissue afferents: a human knee model, Symposium on Joint Neuromechanics at the American Society of Biomechanics Annual Meeting, Portland, USA, September, 2004.

Active Control of the Knee Medial-Lateral Degree of Freedom, Neural Prosthesis Seminar, Biomedical Engineering Department, Case Western Reserve University, Cleveland, USA, December, 2004.

Knee Neuro-Mechanics, Donaghey Collage of Information Science and System Engineering and The College of Science and Mathematics Joint College Colloquium Series, The University of Arkansas at Little Rock, Little Rock, USA, May, 2006.

Neuro-Mechanical Constraints for the Understanding of Pathological Gait, Key Note at the Biomedical Engineering Forum, The University of Arkansas at Little Rock, Little Rock, USA, May, 2006.

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