

L.A. WOJCIK & ASSOCIATES, LLC

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PROFESSIONAL EXPERIENCE

L.A. Wojcik & Associates, LLC

President and Principal Consultant

Ann Arbor, Michigan

April 2010 – Present

Areas of specialization include biomechanical and mechanical engineering, with specific expertise in the forensic analysis of traumatic injuries associated with transportation, industrial machinery, recreational activities and equipment, consumer products, and falls. Additional experience in human injury tolerance, accident reconstruction, human locomotion and balance, machine guarding, geriatric biomechanics, rigid body dynamics, and dynamic systems modeling.

Packer Engineering, Inc.

Vice President, Biomechanics

Senior Director

Director

Ann Arbor, Michigan

June 2008 – April 2010

June 2006 – May 2008

March 2003 – May 2006

Exponent, Inc.

Senior Engineer

Farmington Hills, Michigan

January 2001 – March 2003

Virginia Tech

Assistant Professor

Department of Engineering Science and Mechanics

Blacksburg, Virginia

August 1997 – December 2000

Secured research grants from NSF, NIOSH, the Whitaker Foundation, and the Rockefeller Brothers Fund. Taught courses in statics, dynamics, structural vibrations, dynamic systems modeling, biomechanics, and biomedical engineering. Member of Center for Biomedical Engineering and Center for Gerontology.

University of Michigan

Whitaker Foundation Fellow and Postdoctoral Research Fellow

Department of Mechanical Engineering

Ann Arbor, Michigan

September 1993 – July 1997

EDUCATION

University of Michigan

Ph.D., Mechanical Engineering

M.S.E., Mechanical Engineering

Ann Arbor, Michigan

May 1997

December 1994

Michigan State University

B.S., Mechanical Engineering, Honors College

East Lansing, Michigan

May 1993

CONTINUING EDUCATION

- OSHA 511 – Occupational Safety & Health Standards for General Industry (2009)
- Finance for the Nonfinancial Manager, University of Michigan, Ross School of Business Executive Education (2007)
- Biomechanics of High-Impact Injuries, National Transportation Safety Board (2007)
- Industrial Fork Truck Operator Safety Training (2006)
- OSHA 10-Hour General Industry Safety Standards (2004)
- Human Participants Protection Education for Research Teams, National Institutes of Health (2002)
- Traffic Accident Reconstruction I, Northwestern University Center for Public Safety (2001)
- Advances in Side Impact Test Methodologies and Occupant Protection TOPTEC, Society of Automotive Engineers (2001)
- MADYMO Introductory Training Seminar, TNO-MADYMO North America (2001)

LICENSE

- Professional Engineer, State of Michigan (#6201048642)
- NCEES Record #27220

AFFILIATIONS

- American Society of Mechanical Engineers (ASME)
- American Society of Biomechanics (ASB)
- Society of Automotive Engineers (SAE)
- Tau Beta Pi, Sigma Xi, Pi Tau Sigma, Phi Kappa Phi

PUBLICATIONS

1. Wojcik, L.A., Nussbaum, M.A., Lin, D., Shibata, P.A., and Madigan, M.L., 2011, "Age and Gender Moderate the Effects of Localized Muscle Fatigue on Lower Extremity Joint Torques Used During Quiet Stance," *Human Movement Science*, Vol. 30, pp. 574-583.
2. Lin, D., Nussbaum, M.A., Seol, H., Singh, N.B., Madigan, M.L., and Wojcik, L.A., 2009, "Acute Effects of Localized Muscle Fatigue on Postural Control and Patterns of Recovery During Upright Stance: Influence of Fatigue Location and Age," *European Journal of Applied Physiology*, Vol. 106, pp. 425-434.
3. Wojcik, L.A., Lin, D., Nussbaum, M.A., Shibata, P.A., and Madigan, M.L., 2009, "Age and Gender Differences in the Effects of Localized Muscle Fatigue on Joint Torques Used During Bipedal Stance," *Proceedings of the 2009 ASME Summer Bioengineering Conference*, The American Society of Mechanical Engineers, SBC2009-204239.
4. Davidson, B.S., Madigan, M.L., Nussbaum, M.A., and Wojcik, L.A., 2009, "Effects of Localized Muscle Fatigue on Recovery from a Postural Perturbation Without Stepping," *Gait and Posture*, Vol. 29(4), pp. 552-557.

5. Wojcik, L.A., 2008, "Practices in Engineering Analysis, Education, and Ethics as Applied to Consulting in Biomechanical Forensics," *Proceedings of the 2008 ASME Summer Bioengineering Conference*, The American Society of Mechanical Engineers, SBC2008-192639.
6. Yassierli, Nussbaum, M.A., Iridiastadi, H. and Wojcik, L.A., 2007, "The Influence of Age on Isometric Endurance and Fatigue is Muscle Dependent: A Study of Shoulder Abduction and Torso Extension," *Ergonomics*, Vol. 50 (1), pp. 26-45.
7. Wojcik, L.A., Shibata, P.A., and Sprague, J.K., 2005, "Determining Angular Head Accelerations Using an External Array of Linear Accelerometers: A Preliminary Analysis of Everyday Activities," *Proceedings of the 2005 Summer Bioengineering Conference*, The American Society of Mechanical Engineers, b0055211.
8. Larson, R.E. Fowler, G.F., and Wojcik, L.A., 2005, "Driver Crash Avoidance Behavior: Analysis of Experimental Data Collected in NHTSA's Vehicle Antilock Brake System (ABS) Research Program," The Society of Automotive Engineers (SAE) Technical Paper 2005-01-0423. Also in SAE SP-1934.
9. Wojcik, L.A., 2003, "An Introduction to Musculoskeletal Modeling Using a Bond Graph Approach," *Journal of the Franklin Institute*, Vol. 340, pp. 63-76.
10. Wojcik, L.A., 2003, "Effects of Gender on Single-Step Recovery from Induced Posterior and Lateral Falls," *Proceedings of the 2003 Bioengineering Conference*, The American Society of Mechanical Engineers, pp. 555-556.
11. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 2001, "Age and Gender Differences in Peak Lower Extremity Joint Torques and Ranges of Motion Used During Single-Step Balance Recovery from a Forward Fall," *Journal of Biomechanics*, Vol. 34 (1), pp. 67-73.
12. Wojcik, L.A., 2000, "Musculoskeletal Modeling Using a Bond Graph Approach," *Proceedings of the ASME: Dynamic Systems and Control Division*, Vol. 1, The American Society of Mechanical Engineers, DSC-Vol. 69-1, pp. 35-42.
13. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1999, "Age and Gender Differences in Single-Step Recovery from a Forward Fall," *Journal of Gerontology: Medical Sciences*, Vol. 54A (1), pp. M44-M50.
14. Wojcik, L.A., Etebari, A., and Ferrante, J.A., 1999, "Development of a Virtual Interface for Clinical Musculoskeletal Biomechanics Visualization," *Proceedings of the 1999 Bioengineering Conference*, The American Society of Mechanical Engineers, BED-Vol. 42, pp. 19-20.
15. Wojcik, L.A., 1999, "Bond Graph Simulation of Lower Extremity Muscle and Joint Function," *Proceedings of the 1999 Bioengineering Conference*, The American Society of Mechanical Engineers, BED-Vol. 42, pp. 775-776.

16. Wojcik, L.A., 1997, "A Biomechanical Analysis of the Mechanisms of Fall Recovery in Young and Elderly Adults," Ph.D. Dissertation, Department of Mechanical Engineering, The University of Michigan.
17. Thelen, D.G., Wojcik, L.A., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1997, "Age Differences in Using a Rapid Step To Regain Balance During a Forward Fall," *Journal of Gerontology: Medical Sciences*, Vol. 52A (1), pp. M8-M13.
18. Wojcik, L.A., Schultz, A.B., and Ashton-Miller, J.A., 1997, "Biomechanical Model Analysis of Older Females' Reduced Ability to Regain Balance After a Forward Fall," *Proceedings of the 1997 Bioengineering Conference*, The American Society of Mechanical Engineers, BED-Vol. 35, pp. 453-454.
19. Wojcik, L.A., Thelen, D.G., Ashton-Miller, J.A., Schultz, A.B., and Alexander, N.B., 1996, "Effects of Age on Joint Torques Used to Recover From a Forward Fall," *1996 Advances in Bioengineering - ASME International Mechanical Engineering Congress and Exposition*, The American Society of Mechanical Engineers, BED-Vol. 33, pp. 125-126.
20. Thelen, D.G., Wojcik, L.A., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1995, "Effects of Age on the Ability to Recover From a Forward Fall," *Proceedings of the 1995 Bioengineering Conference*, The American Society of Mechanical Engineers, BED-Vol. 29, pp. 293-294.

CONFERENCE ABSTRACTS and PRESENTATIONS

1. Davidson, B.S., Madigan, M.L., Nussbaum, M.A., and Wojcik, L.A., 2009, "Recovery From Postural Perturbations Without Stepping Following Localized Muscle Fatigue," 33rd Annual Meeting of the American Society of Biomechanics, #1036. (State College, PA)
2. Wojcik, L.A., 2007, "Low Speed Accidents and Soft Tissue Injuries," Iowa Defense Counsel Association Annual Meeting and Seminar. (Des Moines, IA)
3. Wojcik, L.A., 2007, "Engineering the Complex Case: From Medicine to Mining and Beyond," Defense Trial Counsel of West Virginia Annual Meeting. (Myrtle Beach, SC)
4. Wojcik, L.A., 2006, "What Can I Do With My Engineering Degree?" ASME Early Career Forum, American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition. (Chicago, IL)
5. Wojcik, L.A., 2005, "Accident Reconstruction and Biomechanical Analysis for Low-Speed Soft-Tissue Injury Claims," Defense Trial Counsel of West Virginia Annual Meeting. (Stonewall Resort, WV)
6. Wojcik, L.A., 2000, "Design of Musculoskeletal Models Using a Bond Graph Approach," Proceedings of the 19th Southern Biomedical Engineering Conference, p. 23. (Blacksburg, VA)
7. Wojcik, L.A., 2000, "Geriatric Biomechanics," Special Seminar on Comparative Geriatric Medicine, 12th Annual Research Symposium, Virginia-Maryland Regional College of Veterinary Medicine. (Blacksburg, VA)

8. Gerke, S.M., and Wojcik, L.A., 2000, "The Kinematics of Field Hockey Driving Motions," 78th Annual Meeting of the Virginia Academy of Science. (Radford, VA)
9. Wojcik, L.A., 1999, "A Modular Approach to Modeling Lower Extremity Musculoskeletal Function Using Bond Graph Techniques," 17th Congress of the International Society of Biomechanics, *Book of Abstracts*, p. 826. (Calgary, AB)
10. Wojcik, L.A., 1999, "Modular and Virtual Approaches to the Simulation and Visualization of Musculoskeletal Function," Second Conference on the Development of Technology in Medicine for Virginia. (Charlottesville, VA)
11. Wojcik, L.A., Schultz, A.B., Ashton-Miller, J.A., Thelen, D.G., and Alexander, N.B., 1998, "Kinematic Factors Affecting Single-Step Balance Recovery from a Forward Fall," Final Program of the 55th Annual Meeting of the American Geriatrics Society / 19th Annual Meeting of the American Federation for Aging Research, *Journal of the American Geriatrics Society*, Vol. 46 (9), p. S74. (Seattle, WA)
12. Wojcik, L.A., 1998, "Biomechanical Analyses of Mobility and Fall Recovery," First Conference on the Development of Technology in Medicine for Virginia. (Charlottesville, VA)
13. Ashton-Miller, J.A., Wojcik, L.A., Thelen, D.G., Schultz, A.B., and Alexander, N.B., 1998, "Age and Gender Differences in Single Step Recovery from a Forward Fall," National Institutes of Health Symposium - *Bioengineering: Building the Future of Biology and Medicine*. (Bethesda, MD)
14. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1997, "Effects of Gender and Age on the Ability to Recover Balance After a Forward Fall," Final Program of the 54th Annual Meeting of the American Geriatrics Society / 18th Annual Meeting of the American Federation for Aging Research, *Journal of the American Geriatrics Society*, Vol. 45 (9), p.113. (Atlanta, GA)
15. Wojcik, L.A., Thelen, D.G., Ashton-Miller, J.A., Schultz, A.B., and Alexander, N.B., 1996, "Inverse Dynamics Analysis of Joint Torques Used in Balance Recovery After a Forward Fall," The Engineering Foundation - Ninth International Conference on Biomechanics and Neural Control of Movement. (Deer Creek, OH)
16. Wojcik, L.A., Thelen, D.G., Ashton-Miller, J.A., Schultz, A.B., and Alexander, N.B., 1996, "Joint Torques Used to Recover Balance in Forward Falls," Final Program of the 53rd Annual Meeting of the American Geriatrics Society / 17th Annual Meeting of the American Federation for Aging Research, *Journal of the American Geriatrics Society*, Vol. 44 (9), p. P113. (Chicago, IL)
17. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1996, "Effects of Age on Joint Torques Used in Balance Recovery After a Forward Fall," The Whitaker Foundation Biomedical Engineering Research Conference. (Snowbird, UT)
18. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1995, "Do Strengths or Reaction Times Predict Ability to Recover From a Forward Fall?" *The Gerontologist: Program Abstracts - 48th Annual Scientific Meeting*, Vol. 35, Special Issue I, p. 206. (Los Angeles, CA)

19. Wojcik, L.A., Thelen, D.G., Schultz, A.B., Ashton-Miller, J.A., and Alexander, N.B., 1995, "Effect of Age on Ability to Recover From a Forward Fall," Final Program of the 52nd Annual Meeting of the American Geriatrics Society / 16th Annual Meeting of the American Federation for Aging Research, *Journal of the American Geriatrics Society*, Vol. 43 (9), p. SA1 (judged to be one of four outstanding abstracts and presented at opening session of conference). (Washington, DC)

PUBLISHED REPORT

- Fowler, G., Larson, R., and Wojcik, L., November 2002, "Driver Crash Avoidance Behavior in an Intersection Incursion Scenario, Analysis of Experimental Data Developed as Part of NHTSA's Light Vehicle Antilock Brake System (ABS) Research Program," Exponent – Failure Analysis Associates, Inc.

INVITED LECTURES and SEMINARS

- University of Michigan, Marian Sarah Parker Program, January 2011
- University of Missouri-Kansas City, Department of Civil and Mechanical Engineering, ME411/ME5501D Introduction to Biomechanics, October 2008
- University of Michigan, College of Engineering and Ethics in Public Life Initiative, October 2008
- University of Wisconsin-Madison, Department of Mechanical Engineering, September 2008
- University of Michigan, Society of Women Engineers Summer Engineering Exploration Program, July 2007
- University of Michigan, Society of Women Engineers Summer Engineering Exploration Program, July 2006
- Northwestern University, Robert R. McCormick School of Engineering and Applied Science, CIV ENG 395-0 Engineering Forensics, April 2006
- The University of Kansas, Department of Mechanical Engineering, October 2005
- University of Michigan, Society of Women Engineers Summer Engineering Exploration Program, July 2005
- University of Michigan, Engineering Research Center for Reconfigurable Manufacturing Systems, NSF Research Experience for Undergraduates Program, June 2005
- Michigan State University, Biomedical Engineering Society, March 2005
- University of Michigan, Society of Women Engineers Summer Engineering Exploration Program, July 2004
- Virginia Tech, Human Factors and Ergonomics Society, April 2004
- University of Michigan, Orthopaedic Biomechanics Laboratories, October 2001
- Michigan State University, Department of Materials Science and Mechanics, May 2000
- The Cleveland Clinic Foundation, Department of Biomedical Engineering, October 1999
- Northwestern University, Department of Biomedical Engineering, January 1999
- Northwestern University, Department of Physical Medicine and Rehabilitation, January 1999
- Northwestern University, Programs in Physical Therapy, October 1998
- Virginia Tech, Gerontology Forum Series, September 1998
- Roanoke College of Health Sciences, Clinical Medicine Lecture, June 1998
- Virginia Tech, Department of Engineering Science and Mechanics, February 1997
- R.S. Dow Neurological Sciences Institute, December 1996

SELECTED HONORS and AWARDS

- National Academy of Engineering Japan-America Frontiers of Engineering Symposium, 2008
- American Film Institute Catalyst Workshop, 2006
- National Academy of Engineering U.S. Frontiers of Engineering Symposium, 2000
- Young Faculty Award Winner, 19th Annual Southern Biomedical Engineering Conference, 2000
- National Institutes of Health (National Institute on Aging – Brookdale Foundation) Summer Institute on Aging Research, 1998
- Whitaker Foundation Graduate Fellow, 1993-1997
- Tau Beta Pi Graduate Fellow, 1993
- Michigan State University Alumni Distinguished Scholar, 1989-1993

PEER REVIEW ACTIVITIES

- Manuscript Reviewer: *Spine*, *Human Movement Science*, *Journal of Biomechanics*, *Journal of Applied Biomechanics*, *ASME Journal of Biomechanical Engineering*, *Journal of Forensic Biomechanics*, *SAE Transactions*, *ASME Journal of Dynamic Systems Measurement and Control*, *International Journal of Modeling and Simulation*, *International Journal of Solids and Structures*, *International Journal of Vehicle Design*
- Engineering Program Reviewer: ABET
- Proposal Reviewer: National Science Foundation, Virginia Tech, Jeffress Memorial Trust
- Examination Reviewer: NCEES Mechanical Engineering P.E. Exam Committee
- Session Chair/Program Committee Member/Conference Paper Reviewer: ASME, ASB, Human Factors and Ergonomics Society, Gerontological Society of America, Southern Biomedical Engineering Conference, Virginia Academy of Science