



Arizona Biomechanics Consulting, LLC

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LISSETTE M. RUBERTÉ, Ph.D., P.E.

Curriculum Vitae

EDUCATION

Ph.D. in Bioengineering (2009)
University of Illinois at Chicago, Chicago, IL
Thesis Title: "Effect of Lumbar Disc Degeneration on Spine Biomechanics and Trunk Muscle Recruitment Patterns"

Master of Science in Biomedical Engineering (2004)
Northwestern University, Evanston, IL
Thesis Title: "Design of a Locking Humeral Rotator for Above-Elbow Prostheses"

Bachelor of Science in Mechanical Engineering (2001)
University of Puerto Rico, Mayagüez, PR

LICENSES & ACCREDITATIONS

Registered Professional Engineer, Illinois, #062-064409
Registered Professional Engineer, Arizona # 60421
ACTAR, Accreditation Commission for Traffic Accident Reconstruction (January 2015, Accreditation #2793)

ADDITIONAL COURSEWORK

PhotoModeler Collision Reconstruction Course, Virtual Course, September 26-29, 2022
Event Data Recorder Use in Traffic Crash Reconstruction- Level II, Tempe, Arizona, June 7-11, 2021
Event Data Recorder Summit, Crash Data Group & Collision Safety Institute, Houston, Texas, March 9-11, 2020
Crash Data Retrieval Data Analyst Course, Collision Safety Institute, Glendale, Arizona, November 6-10, 2017
Crash Data Retrieval Technician Course, Collision Safety Institute, Phoenix, Arizona, April 26, 2017
Motorcycle Collision Reconstruction - SATAI 2017 Spring Conference, Henderson, NV, Mar 31, 2017
ARC-CSI Crash Team Boot Camp, Las Vegas Motor Speedway, Las Vegas, NV, May 30-June 4, 2015
ARC-CSI Crash Team Boot Camp, Las Vegas Motor Speedway, Las Vegas, NV, May 31-June 5, 2014
Traffic Crash Reconstruction, Northwestern University Center for Public Safety, Phoenix, AZ, August 22-26, 2011
PC Crash Course, Compressed Essentials and Expert Skills, MEA Forensic, Orlando, FL, April 6-8, 2011

POSITIONS

Principal & CEO (March 2016 to present)
Arizona Biomechanics Consulting, LLC, Scottsdale, AZ

- Consultation in the investigation and biomechanical analysis of injuries from product, vehicular, workplace, and other types of accidents

Adjunct Faculty (January 2018 to present)
Scottsdale Community College, Engineering and Computer Science Department

- *Courses Taught:* Engineering Problem Solving and Design (Spring 2018)

Adjunct Faculty (January 2016 to May 2017)
Glendale Community College, Technology & Consumer Sciences, Engineering Science

- *Courses Taught:* Engineering Problem Solving and Design (Spring 2016); Engineering Analysis Tools and Techniques (Fall 2016, Spring 2017)

Associate Engineer (January 2013 to March 2016)
Biomechanics Research & Consulting, Inc., Tempe, AZ

- Consultation in the investigation and biomechanical analysis of injuries from product, vehicular, workplace, and other types of accidents.

Associate Faculty (January 2013 to May 2013)

Arizona State University, School of Engineering of Matter, Transport and Energy

- *Course Taught*: Mechanism Design and Analysis (Spring 2013)

Senior Engineer, Biomechanics Practice

Eponent® Failure Analysis Associates®, Inc., Phoenix, AZ (January 2010 to January 2013)

- Consultation in the investigation and biomechanical analysis of injuries from product, vehicular, workplace, and other types of accidents.

RESEARCH EXPERIENCE

Musculoskeletal Biomechanics Laboratory

Edward Hines Jr. VA Rehabilitation Research and Development Center (2005 to 2009)

- Designed and built an electromechanical lumbar spine analogue to obtain the muscle force values needed to balance an external load. Performed materials testing using Instron servohydraulic system. Purchased equipment hardware and software.
- Performed real-time simulation of spine analogue using Real-Time Workshop and Simulink
- Assisted in cadaver preparation for testing of surgical interventions and prototype medical devices.
- Supervised undergraduate research work.

Computer Assisted Orthopedic Biomechanics Laboratory

Rush-Presbyterian-St. Luke's Medical Center (2005 to 2009)

- Development and validation of a 3D finite element and musculoskeletal model of the lumbar spine to study the influence of disc degeneration on spine biomechanics and muscle recruitment patterns.

Biomechanics in Occupational Safety and Sports Medicine

Northwestern University, Chicago, IL (2004 to 2005)

- Development and execution of an experimental protocol to evaluate the biomechanical effects of sitting posture and vibration frequency on the human response to seated whole-body vibration. Evaluated the design of a new wheelchair with backrest suspension, lumbar support and dynamic pressure relief of ischial loads.
- Collaborated with Physical and Occupational therapists to develop study protocol and Institutional Review Board (IRB) documentation.
- Served as medical interpreter for patients.

Prosthetics Research Laboratory

Northwestern University Chicago, IL (2001 to 2004)

- Research and development of technical assistive devices for persons with upper limb amputations. Developed a working prototype of a prosthetic component that allows rotation about the humeral axis for persons with trans-humeral amputations. Design challenges included designing a low weight rotator with infinite number of locking positions within a highly confined volume.

LEADERSHIP POSITIONS

- Team Leader – ARC-CSI Crash Team Boot Camp, 2015
- Team Leader – ARC-CSI Crash Team Boot Camp, 2014
- Regional Deputy President – Hispanic National Bar Association, Region XIV (AZ & NV) (2011- 2014)
- Vice President and Co-Founder, Graduate Student Association for Latino and Spanish Activities, Northwestern University (2003 – 2005)
- Member of the Science and Engineering Committee in Multicultural Affairs (SECMA), Northwestern University (2004 – 2005)
- Member of the Graduate Leadership Council, Northwestern University (2003 – 2005)
- Public Relations Officer, Tau Beta Pi Engineering Honor Society, University of Puerto Rico Mayaguez (2000-2001)

AWARDS, GRANTS & HONORS

- Diversifying Higher Education Faculty in Illinois Fellowship (2005 to 2009)
- Thomas P. Andriacchi Fellowship for Biomechanics Research, University of Illinois at Chicago (2006 to 2008)
- Travel Grant from the Illinois Latino Council on Higher Education (2007)
- Biotechnology Institute Fellow (2006 – 2007)
- Ford Foundation Predoctoral Fellowship for Minorities Honorable Mention (2005 to 2006)
- Young Educators Fellow, Center for the Advancement of Hispanics in Science and Engineering Education (Summer 2004)
- GEM Fellow, National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc (2001 to 2003).
- Merck Engineering and Technology Scholarship Recipient (1999 to 2001)

LANGUAGES

Spanish - Native speaker

PUBLICATION HISTORY

Publications

- Ruberte, L, Cox, BS and Lantz, S (2016).** The older lady versus the younger lady: Female occupant kinematics in low speed rear end collisions. *Collision Magazine*, 11 (1): 32-45.
- Ruberté, L, Lantz, S, Thompson, R, Chan, M, Clemence, B, Dycus, G, Burton, M, Chan, B, Wong, T and Cox, B (2014).** Low velocity piston isolator testing of a Ford Crown Victoria. *Collision Magazine*, 9(2): 46-53.
- Ruberté, LM and Cardenas-Colenso, Y (2012).** Effective Discovery Tips: How to get the most out of the biomechanics expert. *American Bar Association Newsletter*, Spring, 2012.
- Weaver, B, **Ruberté, L, Khan, F and Arndt, S (2011).** Normal pedal activation in real world situations, *SAE 2011 World Congress*, 2011-01-0551.
- Ruberté, LM, Natarajan, R, and Andersson, G (2009).** Influence of single-level lumbar degenerative disc disease on the behavior of the adjacent segments-A finite element model study, *Journal of Biomechanics*, 42(3):341-48.
- Ruberté, LM (2003).** Development of a New Mechanical Humeral Rotator, *Capabilities*, Winter/Spring 2003, 11(4):15-16.

Conference Presentations

- Ruberté, LM and Weaver, B,** Maximizing your Biomechanical Expert, *DRI Product Liability Conference*, April 3-5, 2013, National Harbor Maryland
- Ruberté LM, Agosto B, and Graffam K,** Belted or Unbelted? The seat belt defense, *Hispanic National Bar Association 36th Annual Convention*, August 31 - September 3, 2011.
- Ruberté, LM, Havey, RM, Dongkeun L. and Patwardhan, AG,** A frontal plane lumbar spine analogue subjected to a follower load by pneumatic muscles, *24th North American Spine Society Meeting*, Nov. 10-14, 2009, San Francisco, CA.
- Ruberté, LM, Natarajan, R, and Andersson, G,** Changes in the quantity and quality of motion of a degenerated lumbar spine during flexion/extension: A finite element model study, *SpineWeek 2008*, May 26-30, Geneva Switzerland.
- Allen, AR, Lent, E, Phelps, J and **Ruberte, LM,** Affording Graduate Education, *2007 National Conference on Graduate Student Leadership*, Nov. 9-11, 2007, Lexington, Kentucky
- Ruberté, LM, Natarajan, R, and Andersson, G,** Biomechanical effect of lumbar disc degeneration on adjacent segments- A finite element model study, *International Symposium on Computer Simulation in Biomechanics*, June 28-30 Tainan, Taiwan
- Ruberté, LM, Natarajan, R, and Andersson, G,** Biomechanical effect of lumbar disc degeneration under flexion/extension- A finite element model study, *ASME 2007 Summer Bioengineering Conference*, June 20-24 Keystone, Colorado
- Ruberté, LM and Heckathorne, CW,** New Cable-Actuated Locking Humeral Rotator, *11th International Society for Prosthetics and Orthotics World Congress*, 2004, presented by Heckathorne in Hong Kong, August, 1-6.
- Ruberté, LM,** Design of a Cable-Actuated Locking Humeral Rotator for Above-Elbow Prostheses, *Black Graduate Student Association 8th Annual Graduate & Professional Conference (2004)*, Northwestern University, Evanston, IL

Poster Presentations

- Ruberté, LM, Natarajan, RN, Andersson, G, Effect of disc degeneration on the kinematics of the lumbar spine-A finite element model study. 54th Annual Meeting of the Orthopedic Research Society, March 2-5, San Francisco, CA**
- Qunli, S, Fang, L, Al-Saeede, S, Ruberté, L, Nam, E, Hendrix, R, and Makhsous, M, Soft tissue stress in buttock-thigh of a seated individual elucidated by a 3D FE Model, 28th Annual RESNA Conference Proceedings, June 25-27, Atlanta, Georgia.**
- Qunli, S, Fang, L, Al-Saeede, S, Ruberté, L, Nam, E, Hendrix, R and Makhsous, M. Finite element modeling of human buttock-thigh tissue in a seated posture, 2005 Summer Bioengineering Conference, June 22-26, Vail Cascade Resort & Spa, Vail, Colorado**
- Makhsous, M, Taylor, S, Pucci, D, Bankard, J, Ruberté, L, Fang, L, Flexible and user-adjustable lumbar-pelvic-thoracic support system for wheelchair seating, RESNA 28th Int. Conf., June 25-27, 2005**
- Makhsous, M, Lin, F, Taylor, E, Thomas, T, Ruberté, L, Hendrix, R, Evaluation of a New Seating Concept with Adjustable Ischial and Back Support, Research Poster Alumni, Physical Therapy and Human Movement Sciences, Oct, 2004**
- Makhsous, M, Lin, F, Taylor, E, Thomas, T, Ruberté, L, Hendrix, R, Effects of a new seating concept on wheelchair usage, pulmonary function and whole-body vibration, BME Research Day, Oct 21, 2004**
- Ruberté, LM and Heckathorne, CW, New Cable-Actuated Locking Humeral Rotator, 2004 National Conference, Society for the Advancement of Chicanos and Native Americans in Science, Oct. 21-24, Austin, TX**
- Ruberté, LM and Heckathorne, CW, New Cable-Actuated Locking Humeral Rotator, 2004 Rehabilitation Engineering and Assistive Technology Society of North America Annual Conference, June 20-22, Orlando, FL**

Journal Peer Reviewer

- Technical Paper, Proceedings ASME 2015 International Mechanical Engineering Congress & Exposition
- Technical Paper, Proceedings ASME 2014 International Mechanical Engineering Congress & Exposition
- Technical Paper, Proceedings ASME 2013 International Mechanical Engineering Congress & Exposition