Exponent®
Engineering & Scientific Consulting

Robert Giachetti, Ph.D., P.E.
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Professional Profile

Dr. Giachetti has experience solving technical problems in a variety of industries including product development, evaluation, assistance with recalls, and mechanical performance of systems. His academic emphasis included topics in mechanics of materials, non-linear continuum mechanics, non-linear dynamics, vibrations, and finite element analysis. His background in mechanics and instrumentation allows him to easily build, monitor, or analyze complex systems. These systems have ranged from wire ropes, cookware, and child carriers to transducers, machine presses and railcars.

Prior to joining Exponent, Dr. Giachetti worked in industry designing steel coiling machinery and overhead lifting devices. While performing his graduate research, he worked in the Biomechanics laboratory at the University of Illinois investigating factors which increase the contact stresses between adjacent components in total knee replacements through three dimensional computer modeling and finite element analysis. His doctoral research in the University of Wisconsin's Biomechanics Laboratory involved characterizing the underlying control strategy of bipedal stability based on the end-point force output of the lower limbs.

Dr. Giachetti has substantial experience utilizing LabView to create specialized data acquisition solutions that implement multiple, simultaneous sensing technologies for real-time analysis. His acquisition solutions have included accelerometers, potentiometers, thermocouples, GPS devices, pressure transducers, force plates, and low-cost web cams. This technology has been used in various ways, including: two-dimensional optical motion capture, custom whole body occupant vibration analysis, custom cyclic load testing, and temperature acquisition.

Dr. Giachetti also has extensive experience utilizing AutoCAD, Ansys, Matlab, Mathcad, EES, and 3DSSPP.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Wisconsin, Madison, 2008

M.S., Mechanical Engineering, University of Illinois, Chicago, 2000

B.S., Mechanical Engineering, Marquette University, 1997

Licenses and Certifications

Licensed Professional Engineer, Illinois, #062062996

Licensed Professional Mechanical Engineer, Oklahoma, #29433

ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities

ASTM Committee F15 on Consumer Products

ASME Committee on Power Transmission and Gearing

Academic Appointments

University of Wisconsin-Madison, Departments of Mechanical Engineering and Kinesiology

- Lecturer, Introduction to Dynamic Systems (Vibrations)
- Teaching Assistant, Introduction to Biomechanics
- Teaching Assistant, Introduction to Dynamic Systems

University of Illinois at Chicago, Department of Mechanical Engineering

- Teaching Assistant, Engineering Economy

Marquette University, Department of Physics

- Teaching Assistant, General Physics

Prior Experience

Intern, BioTechPlex, 2001

Project Engineer, Braner USA, 1998-1999

Estimator and Engineer, Alloy Sling Chain Industries LTD., 1998

Publications

Perlmutter, S, Cades DM, Heller, MF, Giachetti, RS, Sala JB, Arndt, SA. Effects of mobile technology use on walking. Proceedings, 58th Human Factors and Ergonomics Society Annual Meeting, 2014.

Giachetti R, Danek K. Analytical model for estimating knee loads during ladder climbing. ASME 2013 International Mechanical Engineering Congress & Exposition, 2013.

Giachetti R, Weaver B, Trimble J. Real-time monitoring and analysis of whole body vibration in locomotive engineers. 4th International Conference on Whole-Body Vibration Injuries, 2009.

Gruben KG, Giachetti RS, Lazarus JA. Directional control of foot force in Parkinson disease. The Movement Disorder Society's 12th International Congress of Parkinson 's Disease and Movement Disorders, 2008.

Gruben KG, Giachetti RS, Schmidt MW. Control of force direction depends on center of pressure not limb posture. Society for Neuroscience 36th Annual Meeting, 2006.

Giachetti RS, Gruben KG. Foot force direction and center of pressure. Progress in Motor Control V, State College, PA, 2005.

Gruben KG, Hasman CL, Schmidt MW, Giachetti RS, Tan L. Altered directional control of foot force is a primary effect of stroke. Progress in Motor Control V, State College, PA, 2005.

Gruben KG, Lopez-Ortiz C, Giachetti RS. Muscular and postural components of foot force during quasi-static extension efforts. JAB 19(3), 2003.

Gonzalez M, Giachetti R, Aram L, Amirouche F. Validation of a finite element contact model for the use in total knee arthroplasty. Orthopaedic Research Society 47th Annual Meeting, 2001.

Amirouche FM, Giachetti RS, Aram L, Gonzalez M. Induced stress in TKA resulting from malrotation. Summer Bioengineering Conference, 2001.

Aram L, Amirouche FM, Gonzalez M, Giachetti RS. Characterization of contact pressure in total knee arthroplasty as a function of component position and ligament balance. XVIIIth Congress of the ISB, 2001.

Amirouche FM, Giachetti RS, Aram L, Gonzalez M. Validation of a finite element contact model for the use in total knee arthroplasty. XVIIIth Congress of the ISB, 2001.

Amirouche FM, Aram L, Gonzalez M, Giachetti RS, Mahr C. the fitting of the human joint through micro-implanted sensors. Proceedings, 1st Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine & Biology, 2000.

Amirouche FM, Gonzalez M, Aram L, Giachetti RS, Mahr C. A contact pressure based prosthetic fitting device for a Total Knee Arthroplasty (TKA). Proceedings, Engineering of Sport 3rd International Conference and Exhibition, 2000.

Giachetti R, Amirouche F, Aram L, Gonzalez M. Biomechanical problems with contact pressure distribution in the knee joint after total knee arthroplasty. Proceedings, ASME Winter Conference, 2000.

Additional Education & Training

American Gear Manufacturers Association (AGMA) Training: Detailed Gear Design - Beyond Simple Service Factors

Peer Reviewer

ASME 2013 International Mechanical Engineering Congress & Exposition (IMECE), San Diego CA, November 15-21. Track: Dynamics, and Control in Biomechanical Systems.

ASME 2011 International Design Engineering Technical Conference & Computers and Information in Engineering Conference (IDETC/CIE),Washington, DC, August 28-31. Track: Surface Engineering and Tribology.

Session Organizer: ASME 2015 Power Transmission and Gearing Conference

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Senior Managing Engineer

Testimony

Rouse v. Borkwoski, Circuit Court of the Nineteenth Judicial Circuit, Lake County Illinois.

Jenkins v. United Access of Kansas City, LLC, et al., District Court of Wyandotte County, Kansas Civil Court Department.

Woodway v. Chapco, Inc. and Samsara Fitness, LLC, United States District Court for the District of Connecticut.

Namola, et al. v DAE-IL USA, INC. et al., United States District Court for the Northern District of Ohio Eastern Division.

Cahill v. Scheck Mechanical, Illinois Workers' Compensation Commission.

Siegel v. Blue Giant Equipment Corporation, United States District Court for the Northern District of Oklahoma.

Cisneros v. Sheth, Circuit Court of Cook County, Illinois County Department.

Samantha Williams v. Tristar Products, INC., v. Zhongshan USATA Electrial Appliance Co., LTD., United States District Court for the Middle District of Georgia Valdosta Division.

DLP v. Tristar Products, INC., United States District Court Northern District of Georgia Gainsville Division.

Kenya Allen and Loren Allen v. Tristar Products, INC., United States District Court Northern District of Georgia Atlanta Division.