

Robert Giachetti, Ph.D., P.E.
Senior Engineer**Professional Profile**

Dr. Robert Giachetti is a Senior Engineer in Exponent's Mechanical Engineering practice. 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 and monitor complex systems in order to assess their functionality. These systems have ranged from wire ropes, cookware, and child carriers to transducers and railcars.

Prior to joining Exponent, Dr. Giachetti worked in industry designing steel coiling machinery and overhead lifting devices; including tongs, beams, and hooks. 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 extensive 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, vibrational analysis, and temperature acquisition.

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

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, University of Wisconsin – Madison 2008
M.S., Mechanical Engineering, University of Illinois at Chicago, 2000
B.S., Mechanical Engineering, Marquette University, 1997

Licenses and Certifications

Registered Professional Engineer, Illinois, #062062996

Publications

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.

Prior Experience (Engineering)

Intern, BioTechPlex, 2001

Project Engineer, Braner USA, 1998–1999

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

Teaching Experience

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