

Paul Briant, Ph.D., P.E.
Managing Engineer

Professional Profile

Dr. Paul Briant is a Managing Engineer in Exponent's Mechanical Engineering practice. He specializes in solid mechanics, finite element analysis, mechanical engineering, biomechanics, and digital image processing. Dr. Briant has applied his expertise to numerous design analysis and failure analysis problems while at Exponent. He has extensive experience with finite element analysis of medical devices, and he has assisted numerous medical devices companies with both numerical and experimental testing and analysis in preparation for FDA submission. In addition, he has performed many static and dynamic finite element analyses across a wide array of scales, ranging from consumer electronic components to large piping systems undergoing water hammer events.

Dr. Briant has also assisted in a wide range of both litigation and non-litigation mechanical engineering failure analysis cases. These cases include corrosion of fire hydrant components, injury analysis cases, and failure of large dynamic structures. In addition, he has experience with digital image processing and has written algorithms for both military and non-military applications.

Prior to joining Exponent, Dr. Briant's research focused on laboratory and numerical analysis of cartilage tissue mechanics, as well as the design and analysis of orthopaedic biomedical devices. He also has experience using lathes, milling machines, and other shop equipment, and participated in the design and fabrication of Washington University's entry to the Formula Society of Automotive Engineers racecar competition.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Stanford University, 2008
M.S., Mechanical Engineering, Stanford University, 2004
B.S., Mechanical Engineering, Washington University in St. Louis, 2002

Veterans Affairs Pre-Doctoral Associated Health Rehabilitation Research Fellowship, 2006
Stanford Graduate Fellowship, 2002
Antionette Francis Dames Award, 2002

Licenses and Certifications

Registered Professional Engineer, California, #M34711

Publications

Bevill S, Briant P, Levenston M, Andriacchi T. Central and peripheral region tibial plateau chondrocytes respond differently to in vitro dynamic compression. *Osteoarthritis and Cartilage* 2010; 17(8):980–987.

Chaudhari A, Briant P, Bevill S, Koo S, Andriacchi T. Knee kinematics, cartilage morphology, and osteoarthritis after ACL injury. *Med Sci Sports Exer* 2008, in press.

Andriacchi T, Briant P, Bevill S, Koo S. Rotational changes at the knee after ACL injury cause cartilage thinning. *Clinic Orthop Related Res* 2006; 442:39–44.

Book Chapters

Briant P, Andriacchi T. Joint biomechanics: The role of mechanics in joint pathology. In: Kelley's Textbook of Rheumatology, 2007, accepted.

Selected Presentations and Published Abstracts

Briant P, Lieberman S, James B. Residual stress distribution in MP35N due to plastic deformation and comparison to finite element analysis. International Medical Device Conference and Expo, Chicago, IL, October, 2011.

Briant P, Siskey R, Rau A, Easley S, James B. Effect of strain rate on nitinol constitutive modeling in the clinically relevant strain range. ASM Materials and Processes for Medical Devices, Minneapolis, MN, August, 2011.

Briant P, Bevill S, Andriacchi T. Quantifying variations in collagen matrix deformation in loaded articular cartilage. ASME Summer Bioengineering Conference, Keystone, CO, June 2007.

Bevill S, Briant P, Andriacchi T. Numerical and experimental analysis of articular chondrocyte deformation: Calibration of multiscale finite element model. ASME Summer Bioengineering Conference, Keystone, CO, June 2007.

Briant P, Rylander J, Bevill S, Andriacchi T. Effects of altered loading on collagen matrix deformation in articular cartilage. 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 2007.

Bevill S, Briant P, Andriacchi T. Regional variations in chondrocyte morphology as a cause for cartilage degeneration following kinematic changes to normal joint function. 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 2007.

Briant P, Bevill S, Torzilli P, Andriacchi T. Collagen organization in the superficial layer of articular cartilage relative to the mechanical environment within the joint. ASME Summer Bioengineering Conference, Amelia Island, FL, June 2006.

Briant P, Bevill S, Koo S, Andriacchi T. A potential mechanism for the initiation of osteoarthritis at the knee following ACL injury. ASME Summer Bioengineering Conference, Vail, CO, June 2005.

Professional Affiliations

- American Society of Mechanical Engineers (member)
- Orthopaedic Research Society (member)