2018 Faculty Advisor Request form for Graduate Student Position

Location: Wake Forest University

Project Title: Development and Validation of a Finite Element Model of a Modern Football Helmet

Position Need: 1 MS/PhD (PhD preferred), start August 2017

Funding: Funded via a GRA, contract in place

Co-Advisors: Scott Gayzik, PhD  
Associate Professor, Biomedical Engineering  
sgayzik@wakehealth.edu  
www.CIB.vt.edu

Joel Stitzel, PhD  
Professor and Chair, Biomedical Engineering  
jstitzel@wakehealth.edu  
www.CIB.vt.edu

Associate Professor, Biomedical Engineering

VT-WFU Center for Injury Biomechanics  
School of Biomedical Engineering and Sciences  
575 N. Patterson Ave, Suite 120  
Winston-Salem, NC 27101

Specific Project Description: Given the interest in head injury risk in contact sports such as football, and the growth of computational modeling to study injury, there is currently a need for validated, open source, finite element models of commonly used football helmets. Computer Aided Design (CAD) and Finite Element Analysis (FEA) are flexible, mature approaches that are used in the development of vast amounts of products. We take this approach to improve the human-product interface, and the product’s performance. The goal of the project is to create an open source FE model of a modern football helmet. The student will gain considerable experience in the areas of non-linear finite element analysis, model development, human surrogate development, and computational injury biomechanics.

Other Notes: This research effort will be in the Center for Injury Biomechanics (CIB) and you will have the opportunity to work on a range of projects in the field of automobile safety, military restraints, and sports biomechanics. The CIB has two primary research facilities. The first is in the WFU School of Medicine in Winston-Salem, NC and the second is at Virginia Tech. The research at the CIB combines experimental testing, computational modeling, and case analysis to investigate human injury biomechanics.