Postdoctoral Fellow, Johns Hopkins

Biomechanics of Traumatic Brain Injury

A new postdoctoral fellow position is available within the Hopkins Extreme Materials Institute (hemi.jhu.edu) at Johns Hopkins University. The position is in the area of the computational biomechanics of traumatic brain injury. The associated projects, currently funded by NIH and potentially also by DoD, are focused on the development, verification, calibration, validation and application of computational models for the human head and brain. The work is part of a highly collaborative effort through a team that includes investigators at Washington University in St. Louis, the Henry Jackson Foundation, Georgia Tech, University of Delaware and potentially others.

Chronic effects of repeated head impacts, including memory impairment, emotional disorders, and cognitive deficits, are associated with mechanical deformation of the brain during skull acceleration, but the mechanisms of injury remain poorly understood. Computer simulations of the response of the brain to skull motion must be tested using experimental measurements of actual brain deformation; this is particularly important as brain mechanics differ between individuals and between groups of different sex and age. The objective of the effort is to develop such validated computational models for investigations of traumatic brain injury (TBI) and chronic traumatic encephalopathy (CTE). The approach is expected to include the use of data-driven methods to guide and evaluate such models, and the development of lower-fidelity but fast models that can guide more intensive simulations as well as more targeted experiments.

The potential candidate should have a Ph.D. in mechanics, biomedical engineering, or physics, with an interest in pushing the frontiers of biomechanics, and with a strong background in computational methods (the finite element method and the material point method are of particular interest). A willingness to work with experimentalists, biomedical imaging experts and clinicians is expected. An interest in data science and machine learning is a plus.

If you are interested, please send an email to ramesh@jhu.edu with a single PDF file containing your curriculum vitae, the names of at least three references, and a brief (less than 1 page) research statement. Please use the subject line "HEMI Postdoctoral Fellow in Brain Biomechanics." Review of applications will begin February 4, but we will continue to accept applications until the position is filled.

The Johns Hopkins University is an Equal Employment Opportunity and Affirmative Action employer, and is committed to building a diverse environment; women and minorities are strongly encouraged to apply.