Postdoctoral Fellow, Johns Hopkins University

Biomechanics of Traumatic Brain Injury

A new postdoctoral fellow position is available within the Hopkins Extreme Materials Institute (hemi.jhu.edu) and the Image Analysis and Communications Laboratory (iacl.jhu.edu) at Johns Hopkins University. The position is in the area of the computational biomechanics of traumatic brain injury, and the fellow will work directly with the groups of Professor K.T. Ramesh (HEMI) and Professor Jerry Prince (IACL). 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, 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 acquired using magnetic resonance imaging; 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 background in computational methods. A willingness to work with experimentalists, biomedical imaging experts, and clinicians is expected. Postdoctoral Fellows are expected to help mentor graduate students and interact with a broad range of faculty members.

If you are interested, please send an email to ramesh@jhu.edu and prince@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/IACL Postdoctoral Fellow in Brain Biomechanics." Review of applications will begin July 11, 2022, but we will continue to accept applications until the position is filled.

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We provide a highly supportive environment for postdoctoral fellows, including carefully curated workforce development events, short courses, seminars, workshops, teaching and mentoring opportunities, and networking opportunities. Your success is our success, and we hope you will join us!