Alberta Health Services
Glenrose Rehabilitation Hospital

Research, Innovation & Technology Development

"Joining State-of-the-Art Research with State-of-the-Art Care"

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Dr. Samer Adeeb is a professor in Civil and Environmental Engineering whose main area of expertise is numerical modelling using the finite element analysis method for biomedical engineering and pipeline applications. Dr. Adeeb finished his Ph.D. in 2004 with focus on the mechanical behaviour of diarthrodial joints. In particular, he established a functional relationship between the meniscus of the knee joint and the labra of the hip and shoulder joints. Dr. Adeeb worked in the area of musculoskeletal growth and redevelopment in his post-doc at the human performance laboratory in Calgary before joining the University of Alberta as an assistant professor in 2007. Ever since, Dr. Adeeb has focused his research on mechanical and geometric modelling of diarthrodial joints. In particular, Dr. Adeeb's research group showed that for all practical purposes, the talus bone is bilaterally symmetric, i.e., the left and the right tali in an individual are mirrors of each other. His group has also been working on finding an appropriate shape to act as a template for talus bone replacement. This grant will benefit from the expertise of Dr. Adeeb's group as we will focus on the mechanical environment of the talus bone in which a "template" is used to replace an original "talus".

In addition, Dr. Adeeb's research group has developed an innovative method for assessing and monitoring the scoliosis condition using surface topography asymmetry analysis. The group hopes to see the new method implemented

Clinical Implications of Research:

Our group provides support for surgical planning and replacement of the talus bone and we have also developed an innovative method for monitoring and assessing scoliosis using surface topography that we are aiming to have implemented clinically.

Recent Publications

Ndubuaku O, Li Y, Cheng R, Martens M and **Adeeb S.** A Semi-Empirical Modeling Approach for Predicting the Deformational Capacity of Axially-Compressed Cylindrical Shells Based on a Novel Material Stress-Strain Characterization Method. *Thin-Walled Structures*, accepted for publication, 2019.

Agbo S, Lin M, Ameli I, Imanpour A, Duan DM, Cheng R and **Adeeb S**. Experimental Evaluation of the Effect of the Internal Pressure and Flaw Size of the Tensile Strain Capacity of Welded X42 Vintage Pipelines. *International Journal of Pressure Vessels and Piping,* accepted for Publication, 2019.

Ghaneei M, Ekyalimpa R, Westover L, Parent E, **Adeeb S**. Customized k-Nearest Neighbourhood Analysis in the Management of Adolescent Idiopathic Scoliosis Using 3D Markerless Asymmetry Analysis. *Computer Methods in Biomechanics and Biomedical Engineering*, 2019. doi: 10.1080/10255842.2019.1584795.

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