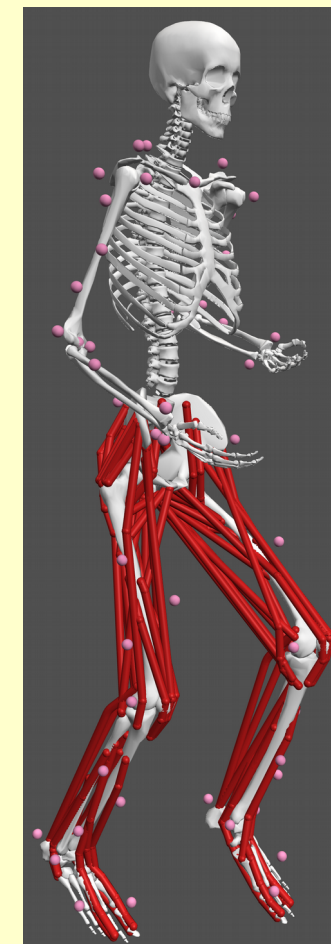
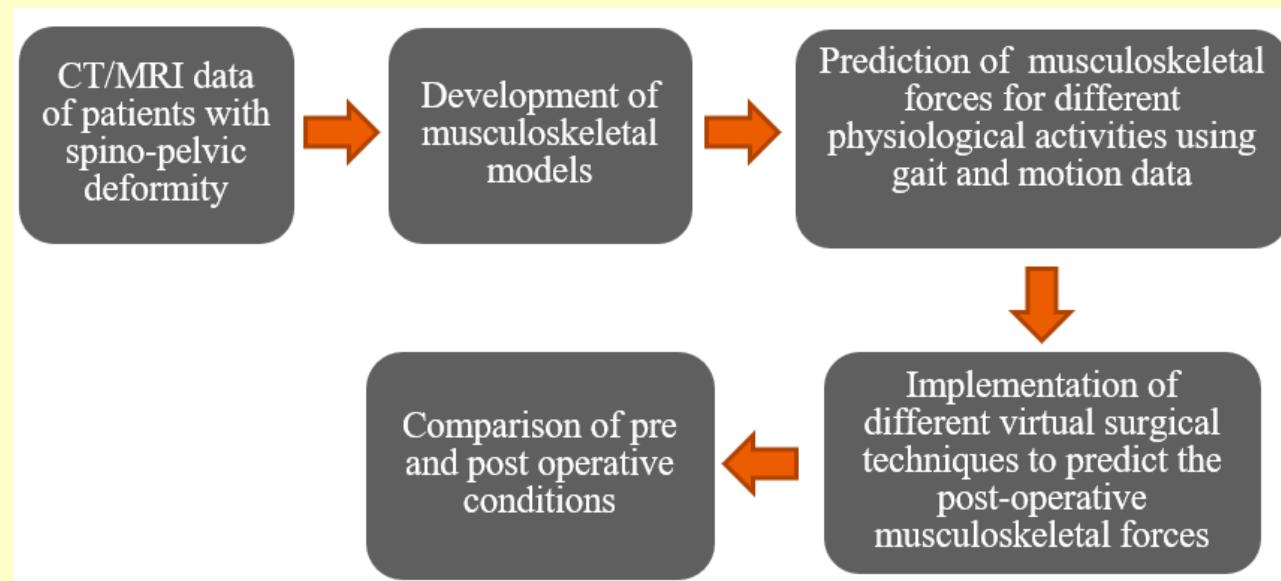


# Musculoskeletal Modelling of Spino-Pelvic Deformity

The fused hip is a debilitating condition affecting the daily physiological activities of a person to a great extent. Total Hip Arthroplasty (THA) is the recommended treatment for fused hips. However, the spino-pelvic corrections in all three planes (sagittal, coronal and axial) make it difficult for a successful THA surgery. Hence, this project is focused on developing a musculoskeletal model-based surgical planning tool for fused hips with associated spinal and pelvic deformity.

The specific objectives of the project are: (i) Develop patient-specific CT / MRI-based musculoskeletal models of patients with spino-pelvic deformity to predict muscles and Joint reaction forces for different physiological activities; (ii) Predict the altered musculoskeletal forces for different surgical interventions to correct the spino-pelvic deformity; (iii) Compare the load-carrying capacity and range of motion of the spino-pelvic construct using the patient-specific FE models together with the musculoskeletal framework.



Supervisor  
**Prof. Anoop Chawla**  
Mechanical Engineering  
IIT, Delhi



Co-Supervisor  
**Dr. Kaushik Mukherjee**  
Mechanical Engineering  
IIT, Delhi



Co-Supervisor  
**Prof. Rajesh Malhotra**  
Head, Department of Orthopaedics  
AIIMS, New Delhi



Research Scholar  
**Rounak Bhattacharya**  
School of Interdisciplinary  
IIT, Delhi