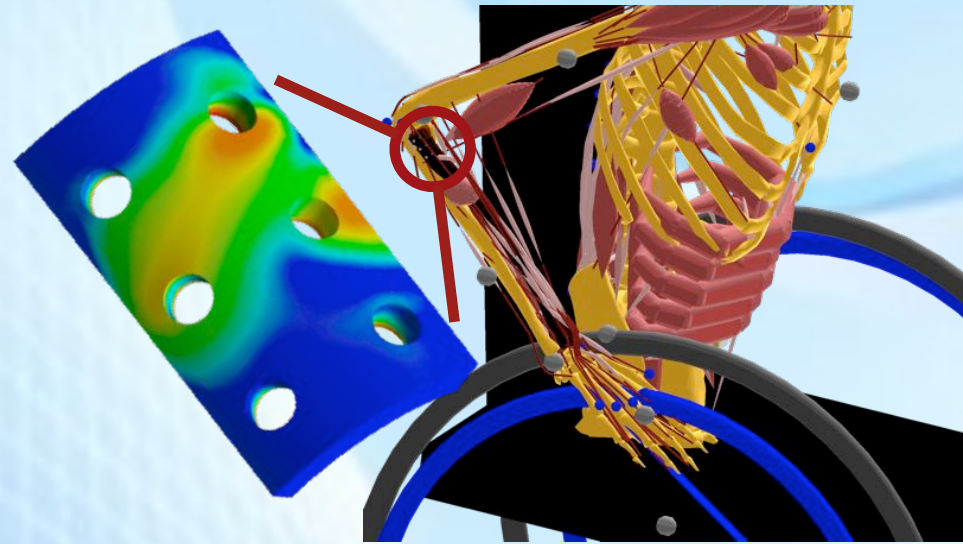


Bridging Musculoskeletal Simulation and Finite Element Analysis



Any2Ans

The return of a patient to activities of daily living following a surgical intervention (i.e. joint replacement, rigid fixation, etc.) involving an implantable device is often used as one component to measure the success of the surgery. The longevity of the implant subject to the forces imposed when performing those normal daily activities is another. As people are living longer and continuing to maintain active lifestyles, the paradigm of everyday activities that are used to evaluate implant longevity must also evolve. Although physiological boundary conditions during pre-clinical implant evaluations have been used for simulating the life span of a new device, only a small number of everyday activities used for deriving those forces have been widely characterized. Utilizing Any2Ans, musculoskeletal simulations can be coupled with finite element analysis to evaluate the design space of an implant subject to loads from specific activities of daily living. By integrating the process in an optimization loop (see flowchart) implant geometry and placement can be evaluated and optimized for strength, fatigue life, and much more!

An Integrated Approach Using:

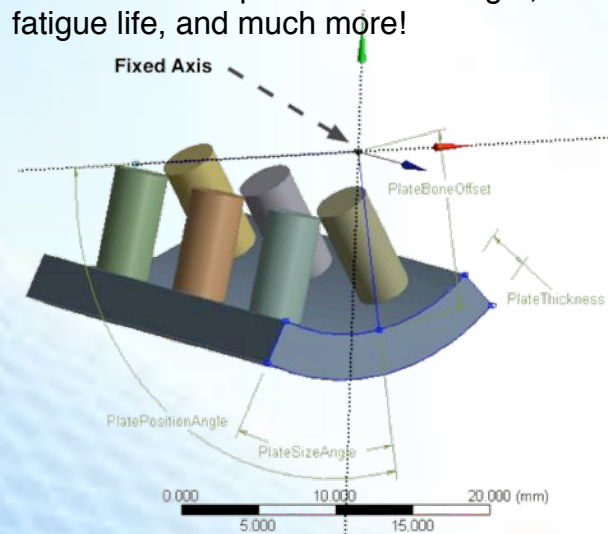
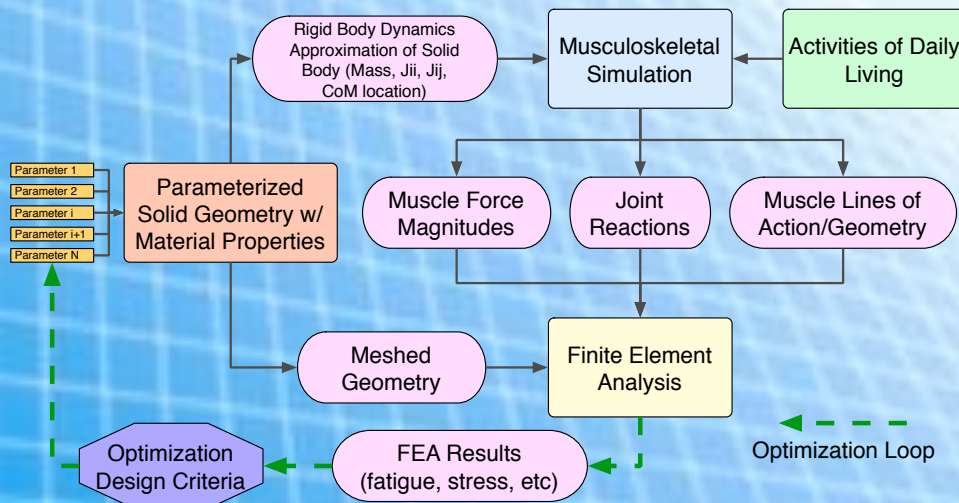
Musculoskeletal Simulation

Activities of Daily Living

Finite Element Analysis

Parametric Design

Optimized Implant Designs



Parameter Ranges	Minimum	Maximum
PlatePositionAngle (degrees):	10	170
PlateThickness (mm):	2	4
PlateSizeAngle (degrees):	35	45