Training Simulation Models

Reference Models for Multi-Layer Tissue Structures

Researchers at the Cleveland Clinic Foundation (Cleveland, Ohio) and Stanford University (Stanford, California) are building web-based interfaces to support data collection. The aims of this work are:

1. Establish an online platform to curate, distribute, and reuse data and models of multilayer tissue structures of musculoskeletal extremities
2. Collect and disseminate anatomical and mechanical data for building and validating reference models
3. Build, validate, and disseminate mechanically advanced reference models representative of nonlinear material properties and realistic anatomy
4. Build and evaluate fast and mechanically simplified yet visually and haptically realistic surrogate models to be used for surgical simulation

At the end of FY17, a web-based data management system was fully operational and populated with human subject testing data relative to thickness and indentation response of skin, fat, and muscle layers of the legs and arms. Magnetic imaging and ultrasound measurement of cadaveric leg and arm models are under development (*Erdemir et al. 2017, Landis and Erdemir 2017*).

In summary, this project provides the foundations for development of authentic and individualized models for simulation of haptics of musculoskeletal extremities for training.

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