Incorporating a graph-matching algorithm into a muscle mechanics model

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Introduction

- Differential models for the simulation of the muscle mechanics are based on iteratively updating a mesh grid and deducing its new state through a finite element model.
- Models usually assume that the mesh grid is almost regular, and this makes a degradation of the simulation accuracy in long simulation sequences.
- The aim of our model is to reduce the accuracy degradation.
- It is based on recomputing the mesh grid in each iteration through the concept of graph matching.
- The new model is currently in use to analyse the dynamics of the human heart when some pressure is applied to it.

Classical iterative model

Our model based on graph-matching

Mesh recomputing
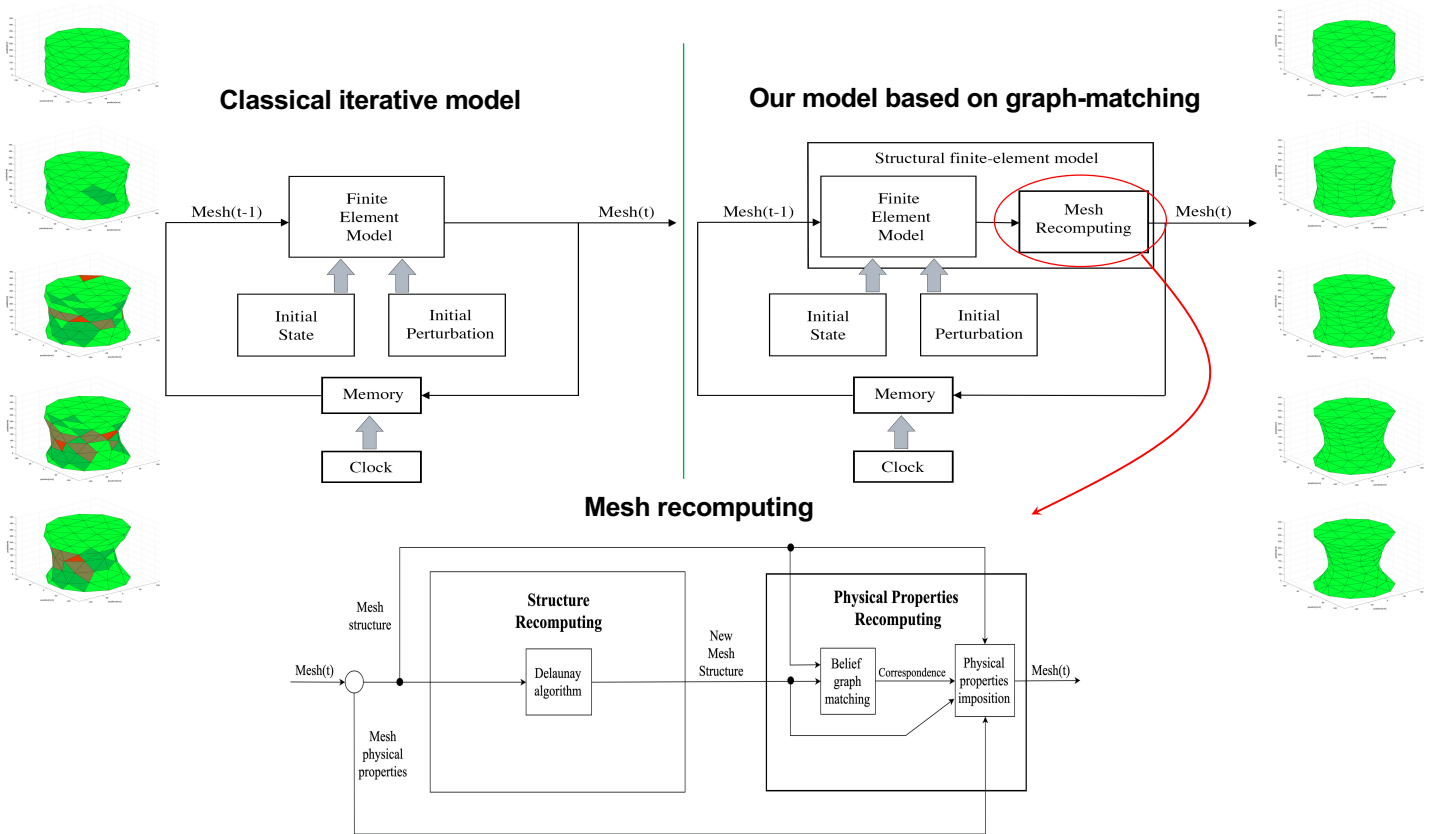
Experimental evaluation
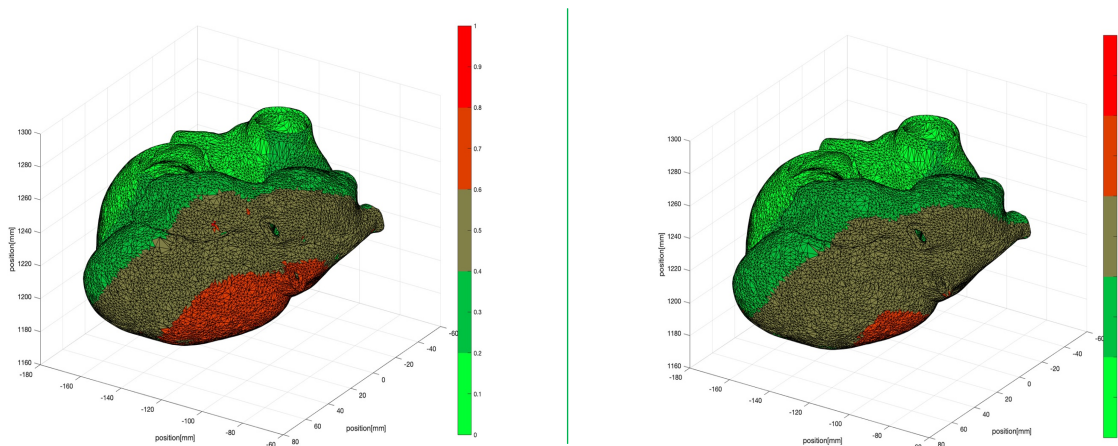
Fortuny, G., Rodríguez-Navarro, J., Susín A., López-Cano, M., **2009**.
Simulation and study of the behaviour of the transversalis fascia in
protecting against the genesis of inguinal hernias.
Journal of Biomechanics 42(14).

Mesh representation of a human heart in the 10th iteration given an initial perturbation.
Colours represent the normalised distance between the real shape and the simulated shape