1002-49-139   **Omar Ghattas*** (`oghattas@cs.cmu.edu`), Depts of Biomedical and Civil & Env Eng, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, and **Larisa Goldmints** and **Branislav Jaramaz**. *Image-based Elastic Registration for Patient-Specific Finite Element Model Generation.*

Direct generation of high-quality patient-specific finite element models for surgical simulation requires image segmentation, surface reconstruction, and mesh generation, and is difficult to automate fully for complex anatomic geometries. We consider simulation of orthopedic surgical procedures based on CT images. We overcome the problem of generating patient-specific models by constructing a high-quality template mesh upfront. Then, for a given patient's CT image, we apply image-based registration to elastically deform the template mesh so that it conforms to the patient's geometry. Examples demonstrate that direct-from-CT meshes can be generated in about 10 minutes on 64 nodes of a Cray T3E. (Received September 12, 2004)

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