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Real-time Knowledge-based Fuzzy Logic Model for Soft Tissue Deformation

- Presents an improved mass spring model to simulate soft tissue deformation
- The first specific contribution on liver modeling using a real-time and knowledge-based fuzzy mass spring model
- Provides a real-time and knowledge-based fuzzy logic model for soft tissue deformation

This book provides a real-time and knowledge-based fuzzy logic model for soft tissue deformation. The demand for surgical simulation continues to grow, as there is a major bottleneck in surgical simulation designation and every patient is unique. Deformable models, the core of surgical simulation, play a crucial role in surgical simulation designation. Accordingly, this book (1) presents an improved mass spring model to simulate soft tissue deformation for surgery simulation; (2) ensures the accuracy of simulation by redesigning the underlying Mass Spring Model (MSM) for liver deformation, using three different fuzzy knowledge-based approaches to determine the parameters of the MSM; (3) demonstrates how data in Central Processing Unit (CPU) memory can be structured to allow coalescing according to a set of Graphical Processing Unit (GPU)-dependent alignment rules; and (4) implements heterogeneous parallel programming for the distribution of grid threats for Computer Unified Device Architecture (CUDA)-based GPU computing.

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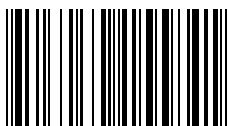
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