

Integration of an Ontology and a 3-D Animation Model for the Digital Human Project

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Motivation

Animation System

- Geometric Modeling
- Parametric Control & Recording
- Limited Simulation
- Interface to:
 - Patient-Specific Data (input)
 - High-Performance Simulation (output)

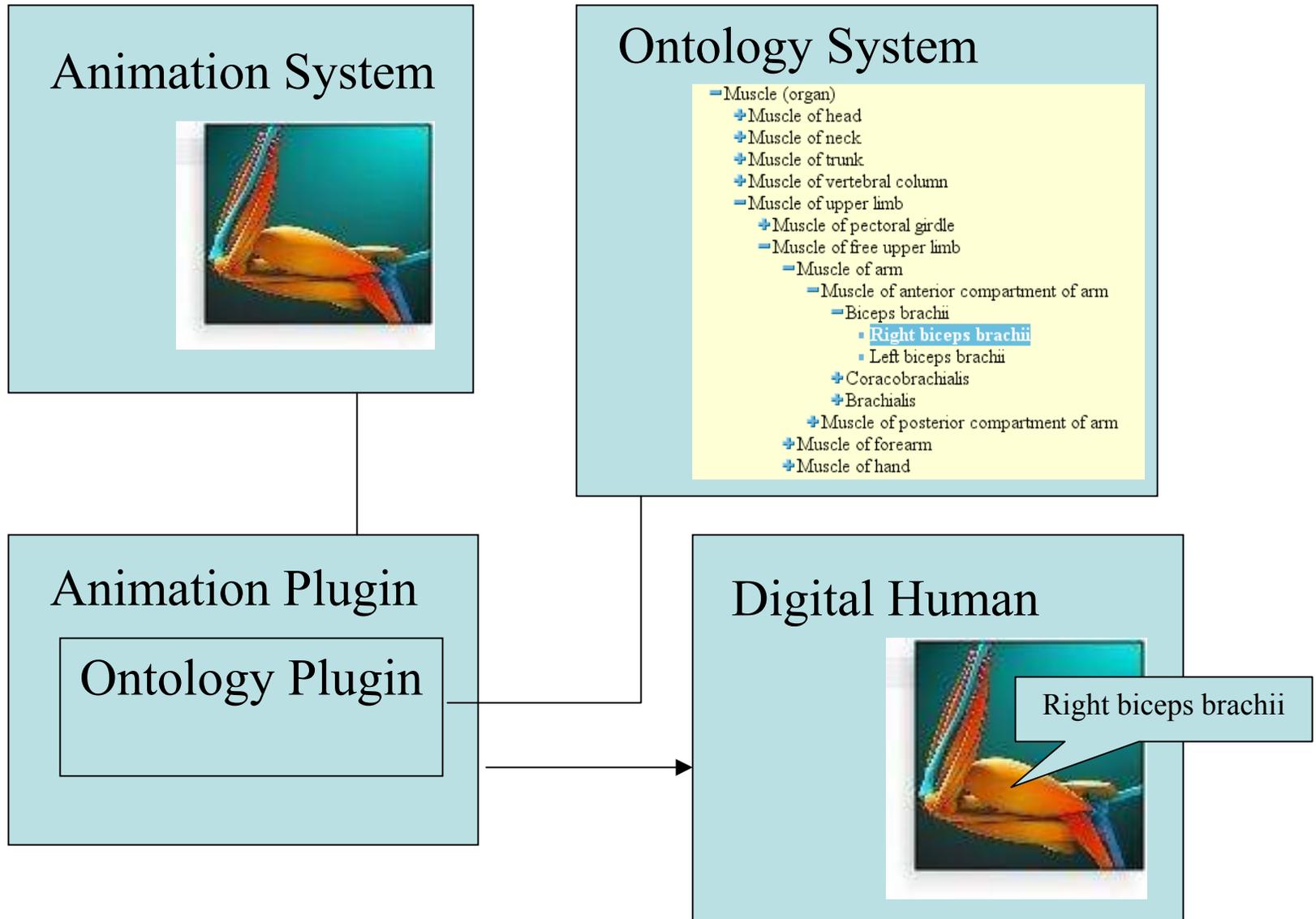
Ontology

- Generic Expert Anatomical Knowledge
 - (Foundational Model)
- Integration of Multi-Level Views Gross Anatomy-to-Cellular
- Relationships Between Concepts
- No Geometry

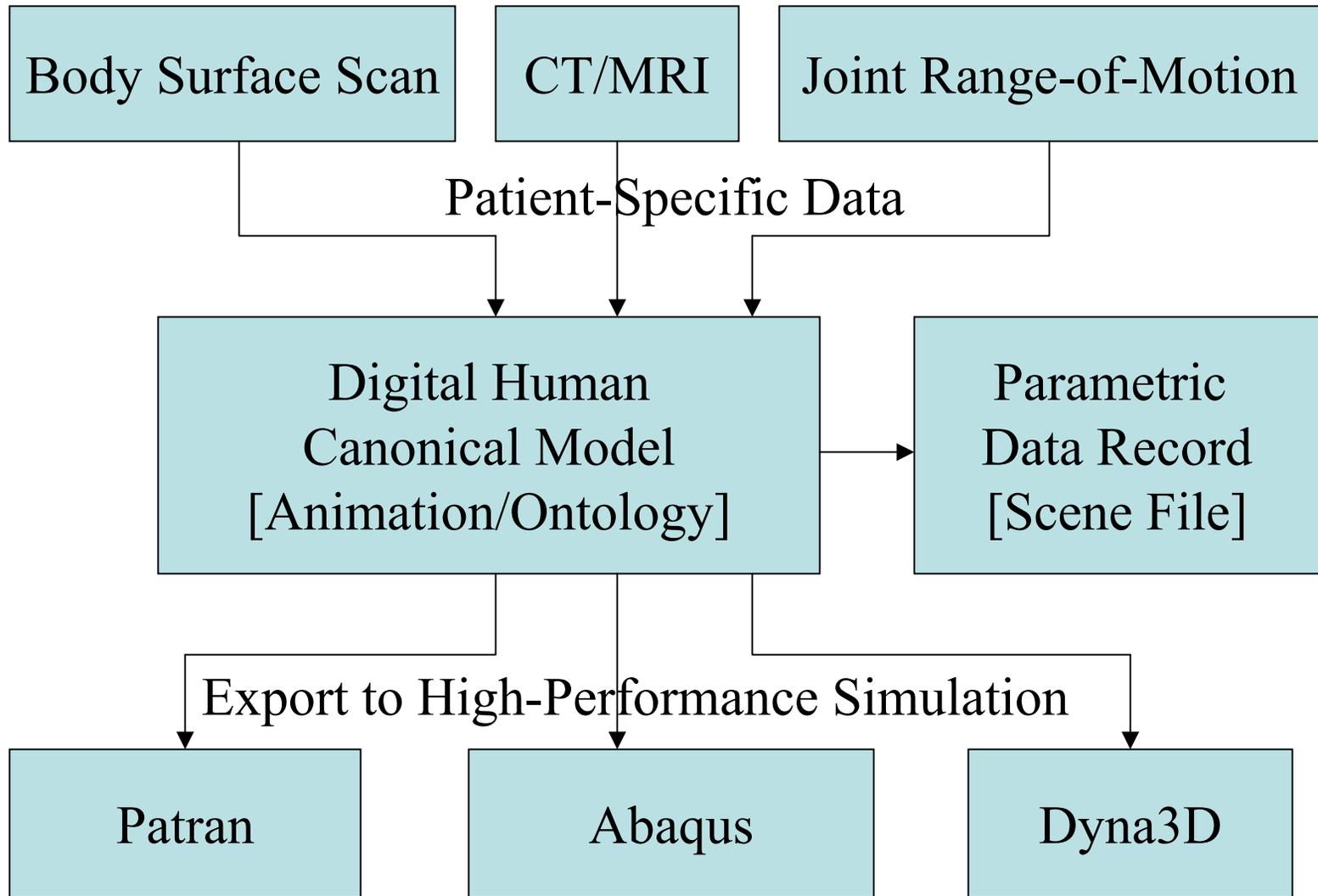
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graph TD; A[Animation System] --> C[Synergy!]; B[Ontology] --> C;
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Synergy!

Animation-Ontology User Interface Implemented Using Plugins



Allow for Multiple Inputs/Outputs



Animation-Ontology Interface is The Link to Applications

- Human Factors
 - Design/Planning
 - Mechanical Simulation
- Virtual Medicine
 - Virtual Surgery & Surgical Planning
 - Virtual Instrumentation
- Treatment
 - Cancer Radiation Therapy
 - Brachytherapy

Conclusions

- Tools needed to link knowledge bases (ontologies) with geometric representations
- Geometric representations should be parametric and scalable
- Link multiple information scales to multiple geometric scales
- These concepts, which constitute the Digital Human, can be implemented using an animation/ontology engine plugin
- Digital Human is both a *geometric interface* and a *parametric reference standard*
- Digital Human animation-ontology interface is a link to other applications