Investigating Ragdolls with Impulses for Game Physics

Authors Name

United Kingdom, author@email.com

ABSTRACT

Most of today's games expect realistic physics as standard, from collapsing buildings to vehicle simulations. When a character is hit or shot he is expected to react realistically, either by stumbling or falling back as you'd expect in real life. Various methods are used to simulate realistic behavior in games, such as springs (penalty based methods), impulses or LCP solvers. The focus of this paper will be on using impulse methods for used with biped models for real-time games. And even though this paper focuses on biped ragdolls, the principles can easily be extended to similar cases (e.g. spider's models, bridges, ropes, etc). We construct the ragdolls dynamically, using their joints and lengths to calculate a variety of test shapes (rectangles, tubes, capsules) for our characters rigid body skeleton. Using a dynamically generated skeleton let us test out various models without much work. Also we could add breakages to the base skeleton which would introduce joint breakages for broken arms or legs quickly. Producing a fast and stable simulator which might not be as accurate as an LCP solver but generates visually realistic results.

Keywords: Ragdoll Real-Time, Games, Physics, Simulation, Constraints, Handheld

Categories and Subject Descriptors (according to ACM CCS): I.6.8 [Simulation and Modeling], I.6.8 [Types of Simulation] : Gaming.
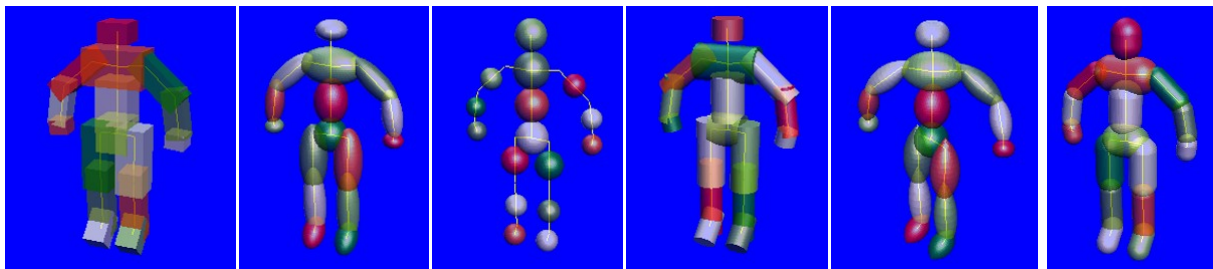
Figure 1: *Showing some configurations for the ragdolls (Cubes, Ellipsoids, Spheres, Cylinders, Rugby's, Capsules)*

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