

The computer animation of articulated figures is one of the most interesting and the most developing areas of the modern computer graphics. The goal of this thesis is to get the reader acquainted with the theory of constrained rigid body simulation, which is subsequently used to construct a generic rigid body simulator with constraints and friction and the figure library suitable for the animation of articulated human-like figures. Articulated figures are represented by sets of rigid bodies (segments) connected by joints and their motion is determined by the dynamics of the corresponding segments. Additional constraints, specifying e.g. desired angles at joints or the positions of selected sites on the surface of the figure segments, allow to control the figure motion. A rich set of interactive demonstration examples presents the features of the actual simulator and the capabilities of the figure library to process motion capture data (replay motion capture data, adapt the data to external influences, map the “raw” motion capture data to the motion of figure segments, etc).