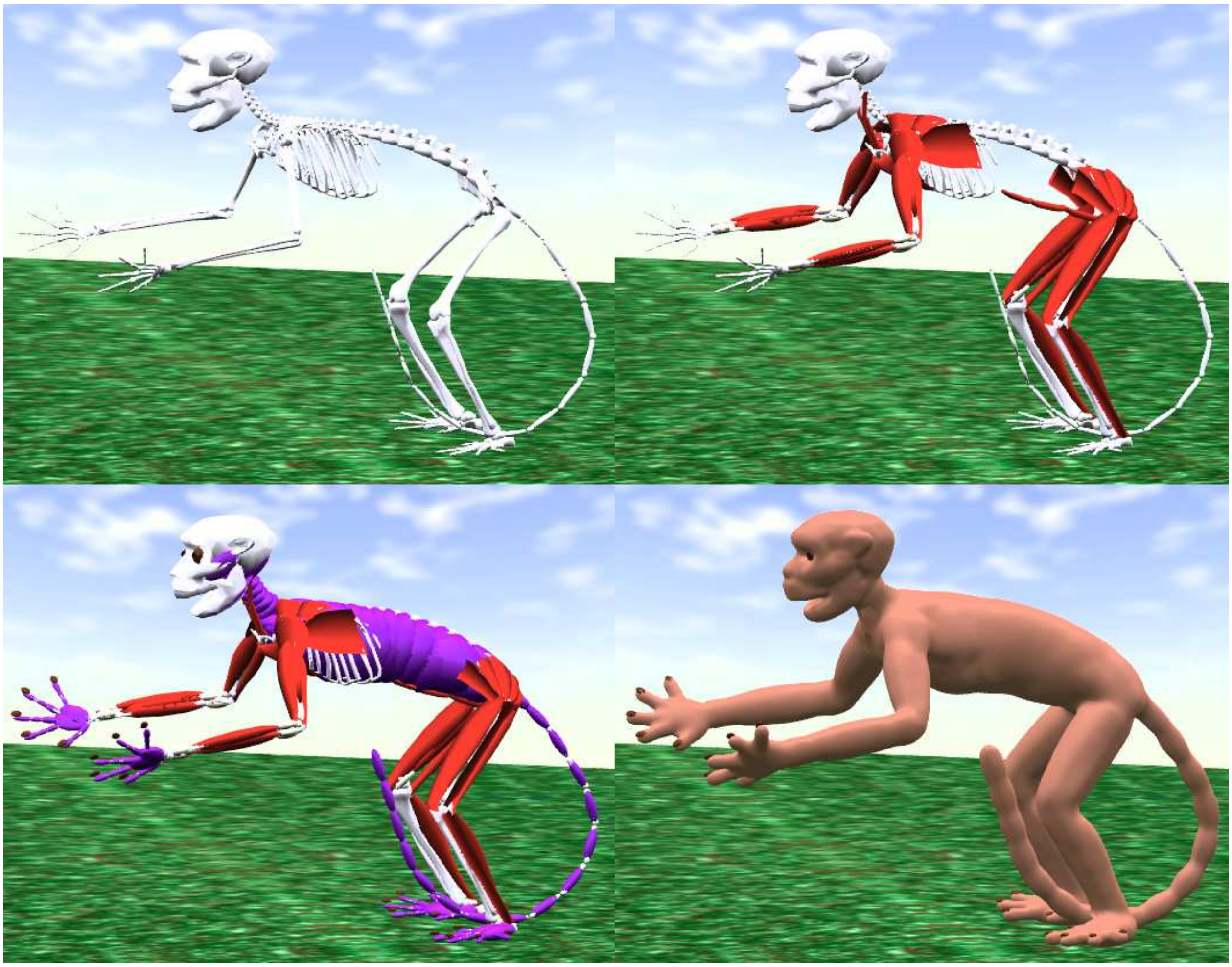

Figure 1: Anatomical components in the default resting posture. The skeleton is shown in white, the muscles in red, and the generalized tissue in purple. The skin with external features (eyes and nails) is shown in the lower right.

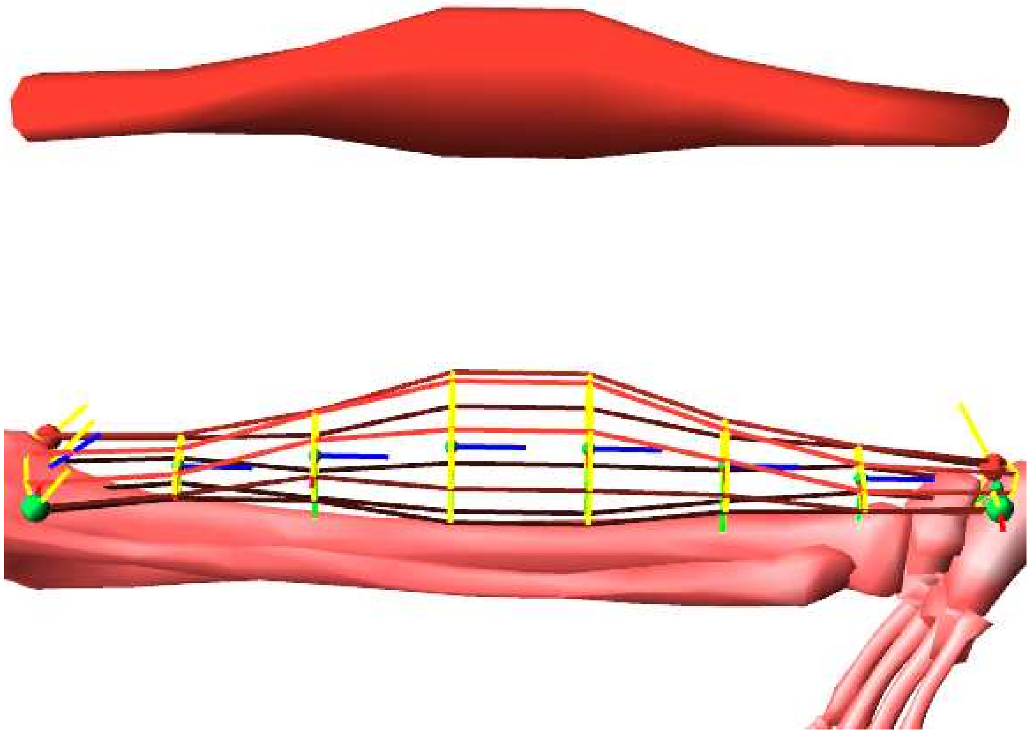

Figure 2: Typical default *deformed-cylinder* muscle, also illustrating anatomical terminology. The *proximal* direction is left, *distal* is right. The muscle is defined by two *origins* (red and green spheres at left) and two *insertions* (same at right). In the wireframe view below, eight yellow cross-sectional slices are connected by red edges to form a polygon mesh. The short blue and green lines are slice coordinate frame $Z-$ and $Y-$axes. Note how the $Z-$axes rise from the origin bone at the first (left) slice, continue along the longitudinal axis of the muscle, and bend down into the insertion bone at the 8th (rightmost) slice. The shaded polygon mesh is shown above.

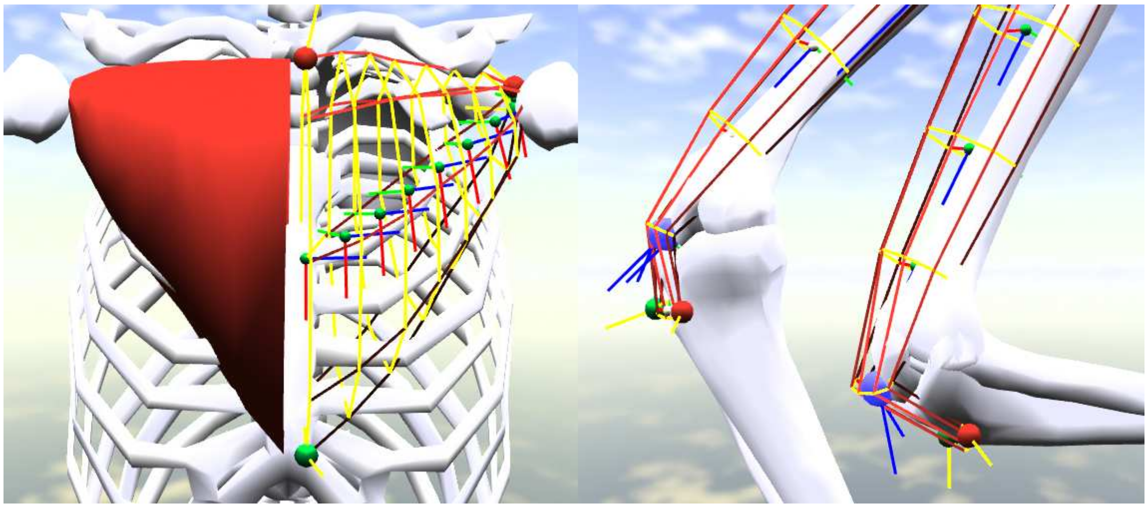

Figure 3: A. (at left) The right pectoralis major muscle, shown shaded, and the left, shown in outline, illustrate a non-default muscle shape set interactively by the user. B. (at right) The quadriceps femoris muscles illustrating the use of a pivot. The right lower leg is in the rest position, and the left lower leg is flexed showing the muscle bending around its pivot.

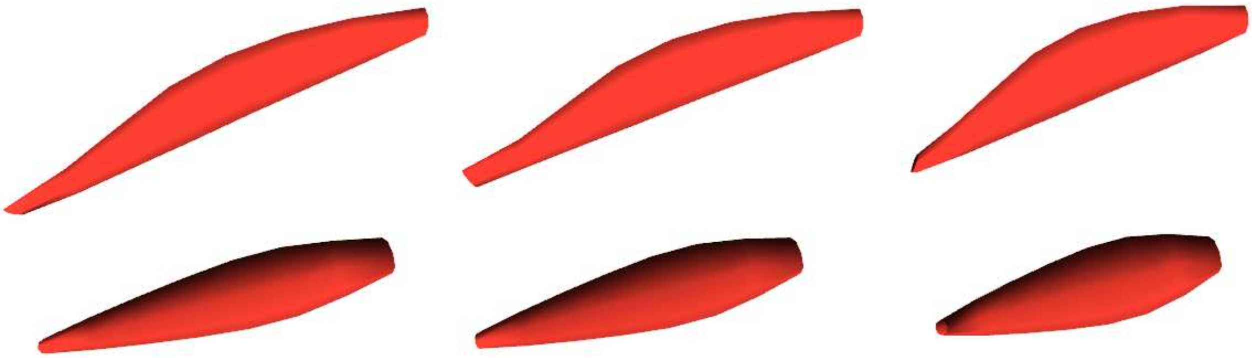

Figure 4: A muscle seen from side and in front at three different levels of contraction.

Figure 5: Four images showing shoulder muscle deformations (shown in red outline) during motion.

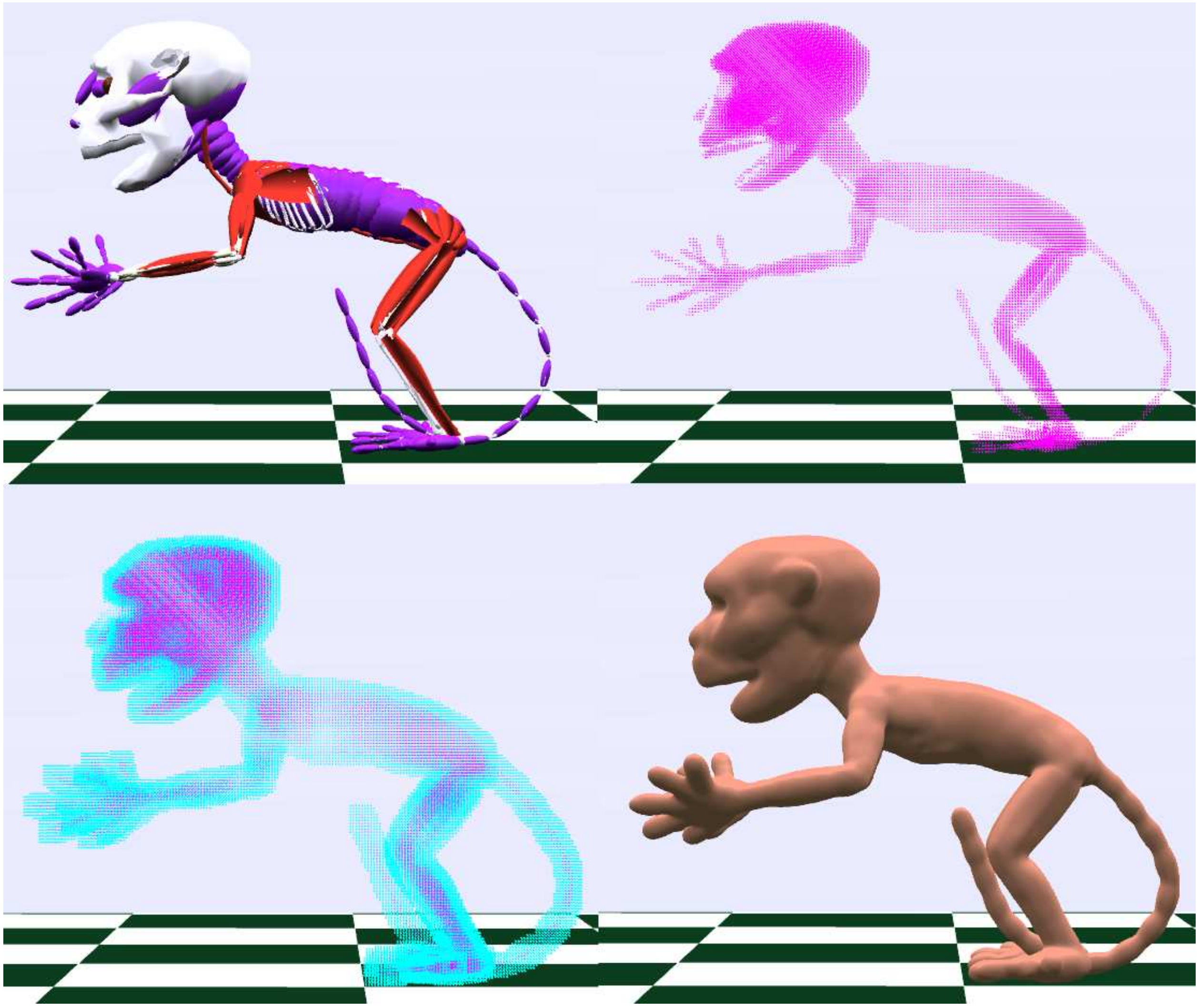

Figure 6: Voxelization and skin extraction illustrated: Upper left is the monkey with enlarged head and extremities for increased skin detail in those areas. Upper right is the initial "density" function over voxel grid whose maximum resolution is 200, showing positive densities in magenta. Interior points are given a value of 200. Exterior points are given a value of 0. Lower left is the "density" after filtering, showing grid points with positive densities in cyan. Lower right is the extracted skin, with an isosurface value of 30. Refer to Section 5 for further discussion.

Figure 7: This figure illustrates the concepts of anchors, virtual anchors, and elastic relaxations, on a raised left arm and shoulder. In the left image, skin vertices have been mapped from the positions of their virtual anchors into world space but no elastic relaxation has been done. The yellow lines connect skin vertices to their muscle anchors; magenta lines connect skin vertices to anchors on bones. At this point, the skin vertices and their virtual anchors are in the same position. In the right image, elastic relaxation has occurred and skin points are close to an equilibrium state. In this image, the red lines connect the skin vertices in their adjusted positions to their virtual anchors, showing the displacement necessary to equalize spring forces.

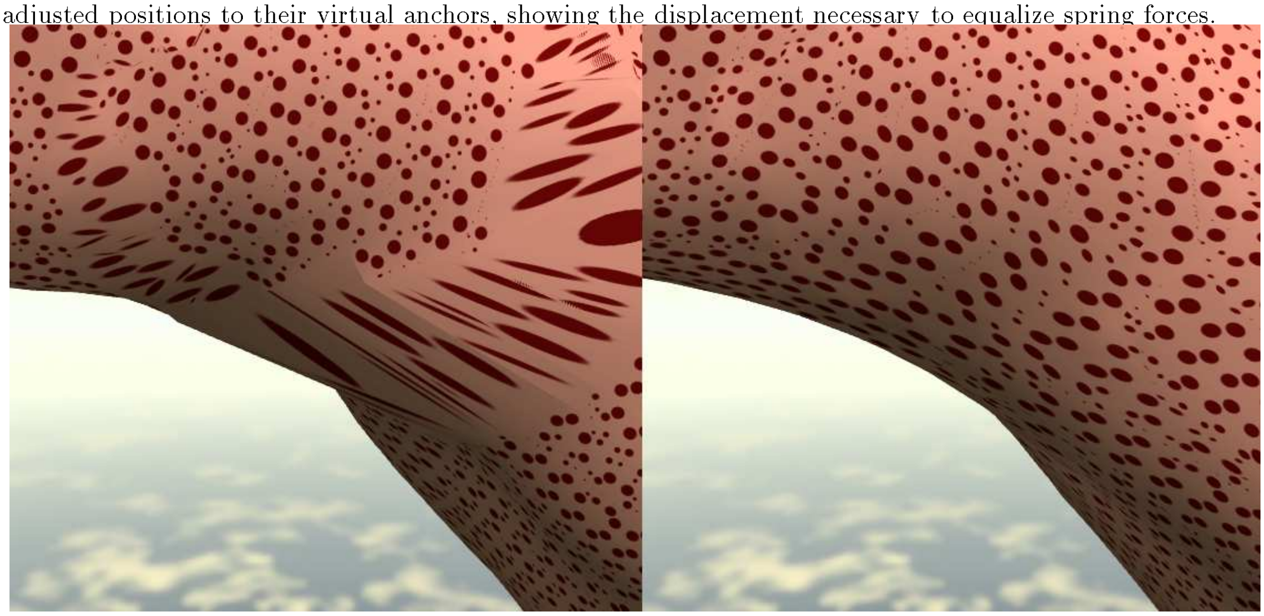

Figure 8: This figure illustrates the effect on skin of elastic relaxation, using the same model and position as in Figure 7. In the rest position, all dots are circular. In the left image, no elastic relaxation has occurred and skin vertices lie on their virtual anchors. In the right image, 30 relaxations have occurred and the skin has largely stabilized.

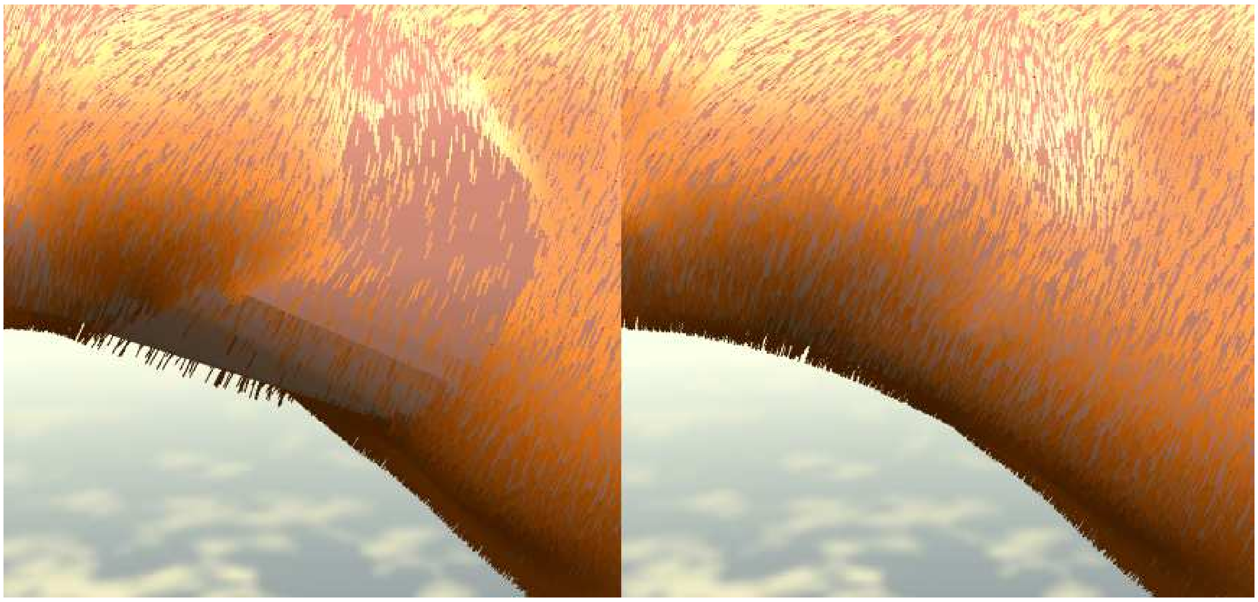

Figure 9: This figure illustrates the same effect as the previous two Figures 7 and 8 when fur is attached to skin triangles. In the left figure, the unequal stretching of the skin produces gaps in the fur, as well as irregularities in the skin surface. On the right, the fur and skin appear normal.

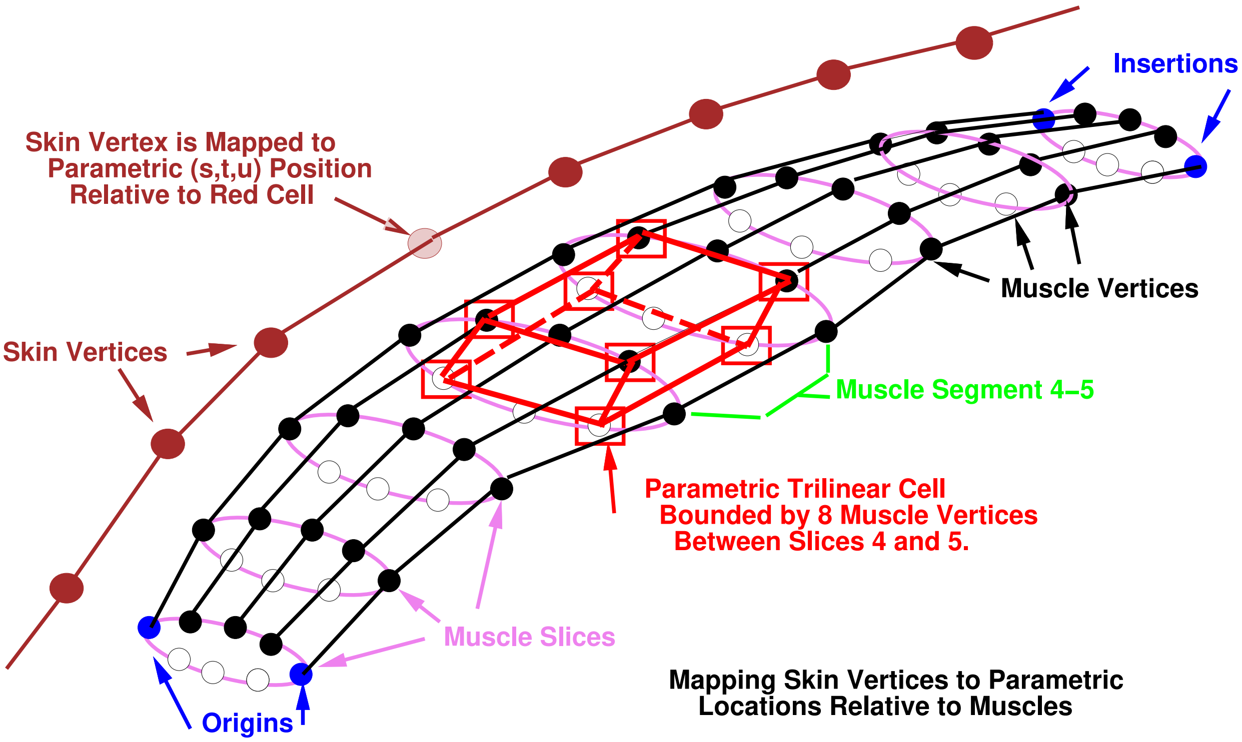

Figure 10: Illustration of mapping skin vertices to parametric trilinear functions over muscle segments. The lightest skin vertex lies between muscle slices 4 and 5, and is mapped into an (s, t, u) coordinate system defined by the eight muscle vertices shown in red.

Figure 11: These three monkeys were made from the identical underlying components and skin as all the other monkeys in the paper. but in the left image the arms are lengthened, in the right image the legs are lengthened, and in the center the skin thickness is increased.

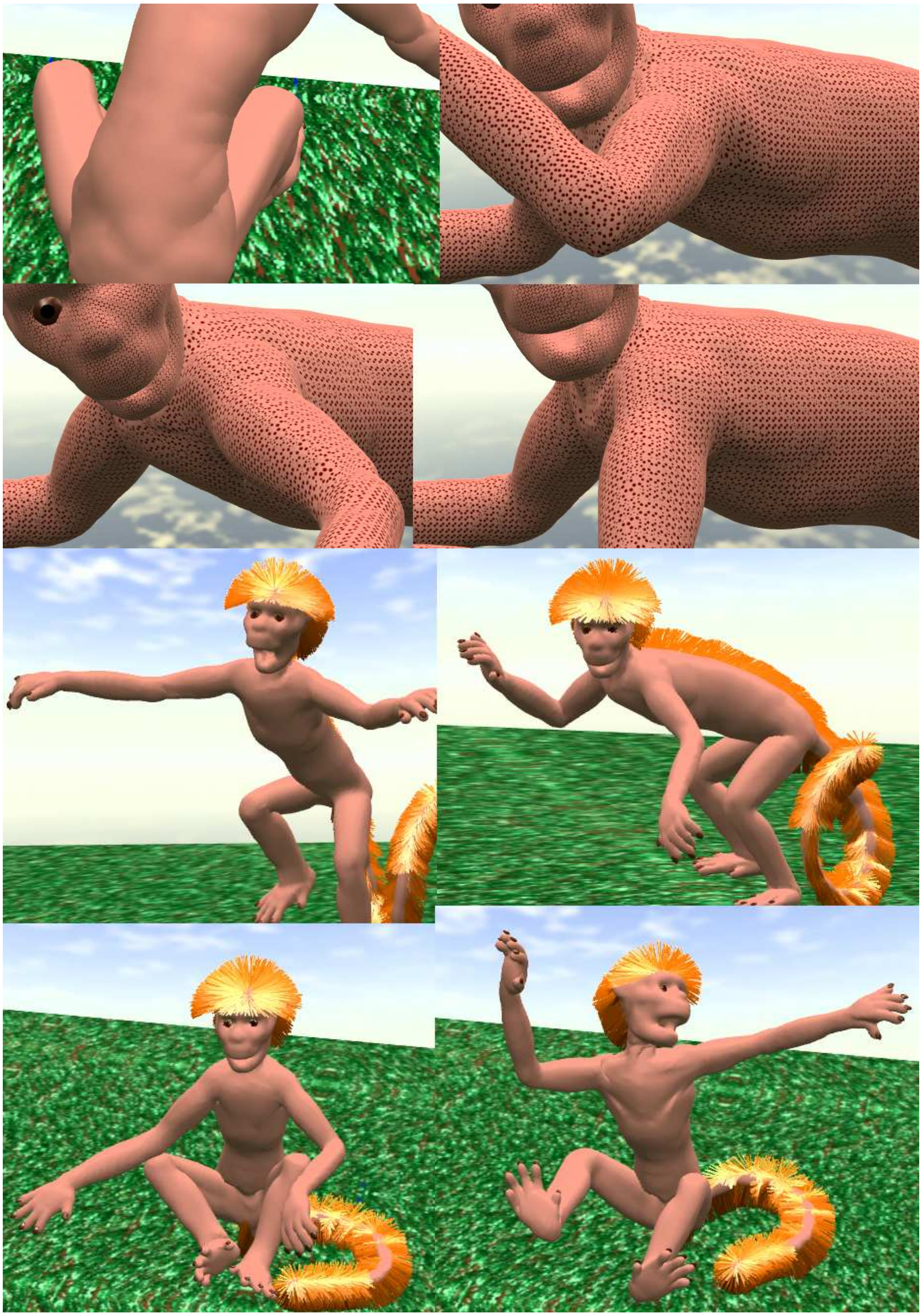

Figure 12: A selection of monkey images. Notice the effect of individual muscles, and the ability of the model to simulate both stretching and folds.