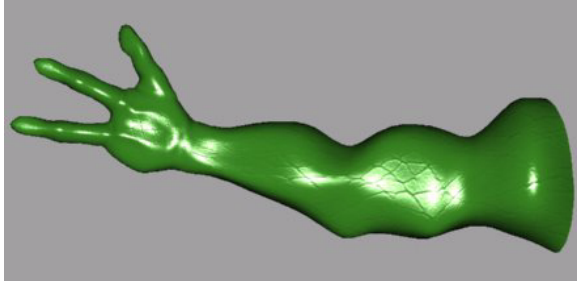# Modeling a Monster Arm

By Jonathan Block

Define the arm shape

This arm was created as part of a creature I was modeling, it doesn't have fewer fingers out of laziness. Few modifications are required to increase the number of digits.

You will draw four curves representing the top and bottom and sides of the arm. Then you will draw cross-section curves through the profile curves and loft the cross section curves.

To draw the profile curves:

1   In the **Front** viewport, use the **InterpCrv** command to draw the top and bottom shapes of the arm from the shoulder to the wrist.

2   In the **Top** viewport, use the **InterpCrv** command to draw the front and back shapes of the arm emphasizing the biceps and elbow.

3   Align the curves with the other curves as shown in the previous two pictures.
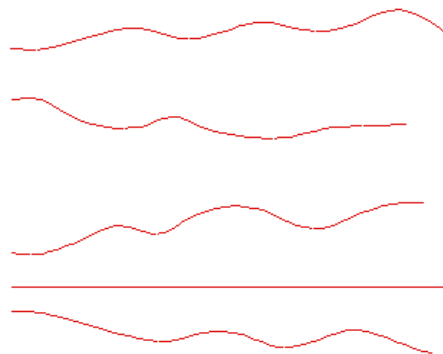
Create cross-section curves

Cross-section curves will be used to define the loft surface.

To draw the cross-section curves:

1   Start the **CSec** command.

2   At the **Select profile curves in order** prompt, choose the curves in the order shown (bottom, front, top, back).

3   In the **Front** viewport, draw lines at approximately right angles to the arm shape curves.

    Make sure the lines cross ALL arm shape curves.

4   Use the **InterpCrv** command to draw curves at each end of the arm shape curves.

    Use object snaps to snap to the ends in the order picked for the cross-section profiles (bottom, front, top, back), and type **C** to close the curve.
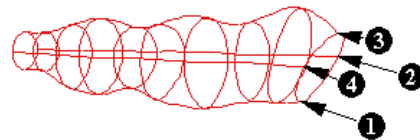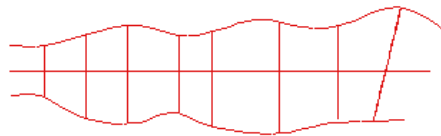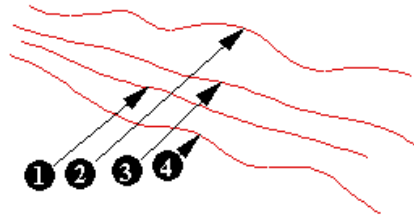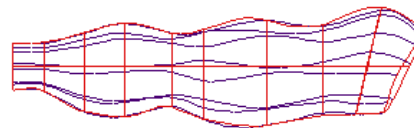
Loft the arm

Lofting creates a surface through curves.

To loft the cross-section curves:

1   Select all the arm curves.

2   Start the **Loft** command.

3   In the **Loft Options** dialog box, use the **Rebuild with control points** option to set the number of control points to **8**.
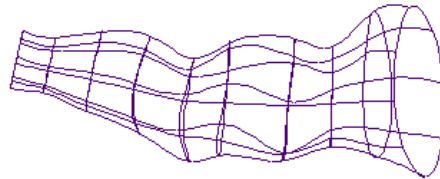
Fine-tune the arm surface

Turn on and move control points to refine the surface.

To refine the surface:

1. Turn on the surface **control points**.

2. Drag and **Move** the control points to fine-tune the muscle groups and position the arm.

Tip: Move control points in groups to get uniform results. **Move** and **Scale** are particularly effective for shaping surfaces.
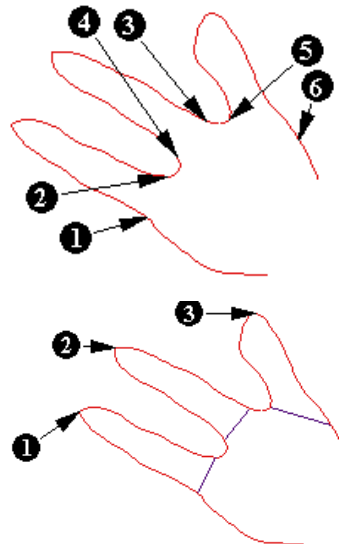
Create the hand

Hide the arm first, so you can work on the hand.

To draw and prepare the hand:

1. **Hide** the arm surface and curves.

2. Use the **InterpCrv** command to trace the outline of a hand.

3. **Split** the curve at the point as shown with the **Point** option.

   Each of the fingers and thumb will be created separately using the same technique as was used for the arm.

4. **Split** the finger curves at the tips.

5. Use the **Line** command with the **End** object snap to draw lines at the base of the fingers as shown.

To create the top and bottom profile curves for the fingers:

1. Select the two curves of the finger.

2. Start the **Rotate 3-D** command.

3. For the first axis point, pick the intersection of the finger curves and for the second, pick the midpoint of the line at the base.
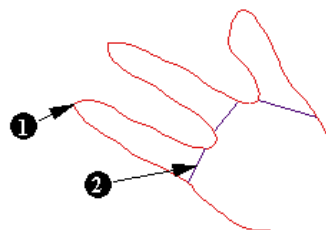
4   Use the **Copy** option, and in the **Right** viewport, use **Ortho** to rotate the curves 90 degrees from each other.

5   Select the upper and lower finger curves and turn on their control points.

6   **Move** the control points to define the knuckles and fleshy parts of the finger.

7   Repeat this procedure for the other finger and the thumb.

   Tip: Move the control points towards the middle of the fingers more than the ones on the ends.
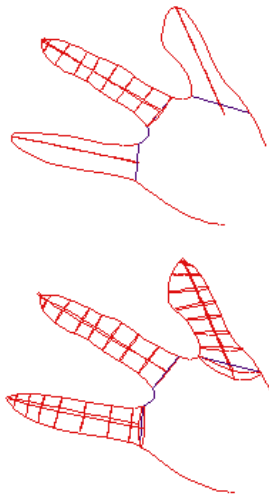
Create the finger surfaces

The creation method for the fingers is similar to the one used for the arm.

To create the cross-section curves for the fingers:

1   Use the **CSec** command and choose the curves for the index finger (bottom, front, top, back).

2   Draw the sections perpendicular to the finger shape curves, making sure they pass through all four curves.

   The number of cross-section curves you use depends on the detail you want around the joints

3   Use the **InterpCrv** command with the **End** object snap to create a curve at the base of the finger using the same order as for the CSec command (bottom, front, top, back), type **C** to close the curve.

4   Repeat the previous three steps for the other finger and the thumb.

To use a lofted surface to create the fingers:

1   Use the **Point** command with the **Int** object snap to create a point object at the end of the index finger.

   This point helps guide the loft closed.

2   Repeat this step for the other finger and thumb.

3   Select the finger curves and the point object.

4   Start the **Loft** command.

5   In the **Loft Options** dialog box, use the **Rebuild with control points** option to set the number of control points to **8**.
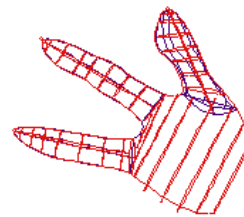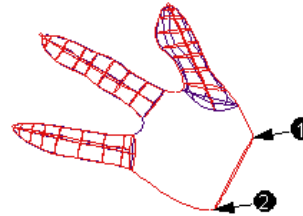
Create the main hand surface

To make the hand surface, you will draw and copy an ellipse curve for lofting the hand surface.

To create the loft curves for the hand:

1 Start **Ellipse** command with the **Diameter** option.

2 Snap to both curves at the base of the hand.

3 In the **Front** or **Right** viewport, drag the height to be a bit taller than the fingers.

4 **Copy** the hand curve to other positions along the hand.

5 Use the **Scale1D** command to stretch the hand curves to match the boundaries.

6 Place a **Point** between the fingers.

To loft the hand curves:

1 Select the curves and the point between the fingers.

**2** Use the **Loft** command to create the finger surfaces.
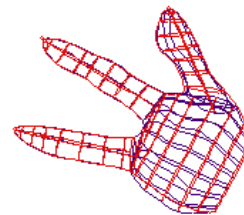
Trim the hand

In the next step, you will trim the hand surface back from the fingers so you can create a smooth blend between the fingers and hand.

To create the trimming surfaces:

1 In the **Top** viewport, use the **Arc** command with the **StartPoint** option to choose the start of arc, the end of the arc, and the direction, to draw arcs that intersect the hand surface as shown.
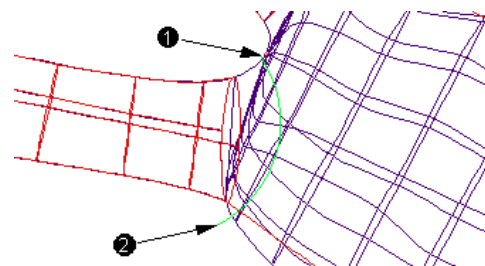
2   Repeat the previous step for the other finger and thumb.

3   In the **Top** viewport select one of the arcs and start **Extrude** command with the **Straight** option.

        In the **Right** viewport, make sure the surface you are creating is thicker than the hand surface.

4   If you need to, **Move** the new surfaces so they completely intersect the hand surface.

Tip: You may want to modify the trimming surface for the thumb to cut away more of the palm area, this will create a more realistic bulgy blend on the underside of the hand where the thumb meets the palm.
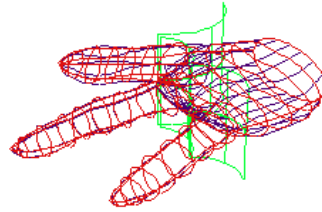
To trim the hand surface:

1   **Trim** the hand near the finger with the new surface.

2   Repeat the previous step for the finger and thumb.

        It may be necessary to use **Split** to separate the other surfaces, then simply delete the unneeded surface.

**3**   **Hide** or **Delete** the surfaces you used to trim the hand.
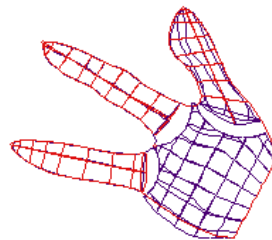
Attach the fingers to the hand

Now you can create a smooth blend between the fingers and hand.

To create the blend surface:

1   Place the surfaces on a different layer and **Hide** all the curves so only the hand and finger surfaces are showing.

2   Use the **BlendSrf** command to create a surface between the base of each finger and the trimmed part of the hand it corresponds to.

        Make sure the direction arrows are aligned.

Tip: If you are getting too much bulge in the blend surface (particularly between the thumb and the hand, try using the **PlanarSections** option. At the **Direction** prompt, in the **Top** viewport draw a line from the center of the trim out towards the tip of the finger you are blending to.
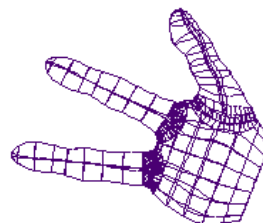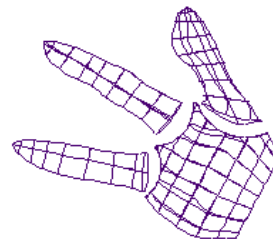
Attach the hand to the arm

Now you can create a smooth blend between the hand and the arm.

To create the blend surface:

1 **Show** the arm surface.

2 Align the hand to its position on the arm.

3 Use the **BlendSrf** command to create a surface between the end of the arm and the base of the hand.

Tip: It may be necessary to **Scale** the control points at the wrist or the base of the hand so the edges are similar. This will result in a more even blend.

4 **Join** all the surfaces.