Interactive Decal Compositing with Discrete Exponential Maps

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Figure 1: *The base texture and feature textures for this dog were segmented from a few photographs, two are shown in the figure. Generating the lapped base fur texture takes from a few seconds to a few minutes, depending on the number of decals and the sampling rate of the underlying point set. The eyes, nose, and extra fur textures take only a minute to position. The extra fur textures (and the fur on the edge of the eyes) help break up the semi-regularity of the base texture, creating a much more compelling result.*

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Figure 2: *An implicit model of the clay elephant statuette in the photograph was created with sketch-based modeling software in under an hour. Then, photographs of the statuette were taken and from those photographs a set of feature textures were extracted (upper right). A base texture was also extracted, which was lapped to create a base model. Then the feature textures were interactively placed over the base model. Texture placement was very quick, the total time including taking photographs and cutting out the relevant features was approximately an hour. However, low lighting conditions and "automatic color balancing" hardware on the digital camera resulted in each photograph (and its feature textures) having a slightly different color balance from the base texture and eachother. Manual color balancing took an additional two to three hours.*

Figure 3: *This implicit gremlin model was textured using the 19 images shown in the top right. The base skin texture is created by lapping an image taken from the photograph shown on the middle right. The model was textured separately in 4 parts - arm, head, body, and leg. The arm and leg were duplicated, and then the parts were assembled. Of the 392 decals used in total, 78 were manually placed, including 24 for the hand. The rest were generated automatically, either with texture lapping or by duplicating the arm and leg.*
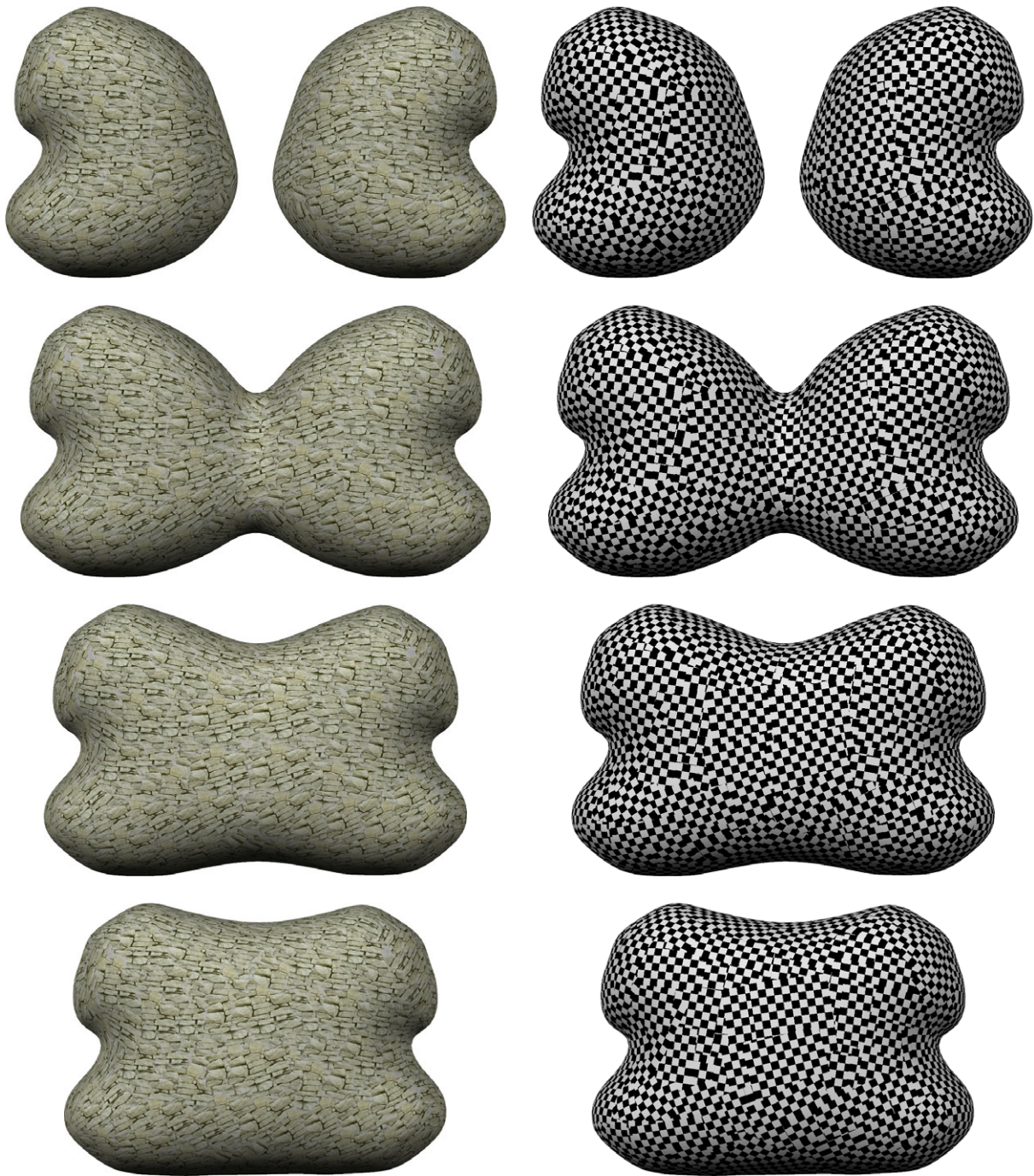
Figure 4: *Snapshots from an animation of two implicit surfaces blending, where each surface is textured with lapped decals. The left column shows the lapped textures, the right column shows the same decals with a checkerboard texture. The decals smoothly flow into the blending region, and appear to slide together in the video. Only the decals covering the portion of the changing surface are affected, decals on the far sides of each object are stationary. There is very little distortion in any particular decal, as can be seen from the checkerboards.*