TK2a-02 3D Digital Image Viewer

Student Name: Chan Billy (00139667)
Lam Tania (00110623)

Supervisor Name: Dr. C.W. Kok, Ted
3D image morphing (View morphing) is a technique that creates images at various points of view of an object without use of 3D model, provided that two images of different views of the same object are given. For instance, if two images, each one of taken from the left side and the right side of the same person is given, we would like to produce view morphing results that consists of a sequence of images that show the face of that person at different point of views, similar to those obtained by taking photos of the same person with camera moving continuously from the left side of his face to the right side. Thus, view morphing between two images of an object taken from two different viewpoints produces the illusion of physically moving a virtual camera. The most powerful feature of this technique is that we do not need to know to know, nor calibrate the camera pose before taking the photos to be used in the view morphing.

The view-morphing tool has high commercial value. For example, e-business over the Internet requires 3D models to be provided to customer to preview retailed goods. Building and transmitting a 3D model is both time consuming, requires a lot of bandwidth, and difficult and expensive over to the customer’s computer from the e-business server. With view morphing, the 3D model can be built from two 2D images. The time-delay between the viewer selections and the display of the 3D models can be greatly reduced, and thus result in a greater chance to attract the customers. Besides reduced transmission bandwidth, it is cheaper and easier to produce the 3D viewing models through view morphing than the conventional techniques. Furthermore, repeated use of view morphing will allow the production of full 360° view of the retail goods from just four 2D images. Besides, the potential in e-business, view morphing also has a lot of potentials in other computer graphics applications. For example, image morphing that allows one image to be morphed to another totally different image has been used in the production of TV commercials, MTVs, and even Hollywood movies. The view morphing system that we are proposing in this project will allow, simultaneously, the morphing from one object to another. So view morphing is a technique that has tremendous potentials.
Specify corresponding quadrilaterals

Apply affine transform to each pair of corresponding quadrilaterals

\[
x' = \frac{m_0x + m_1y + m_2}{m_6x + m_7y + 1}
\]

\[
y' = \frac{m_3x + m_4y + m_5}{m_6x + m_7y + 1}
\]

Hole filling

New image file(s)