



SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

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Department of Information Technology & AI&DS

Course Name – COMPUTER GRAPHICS

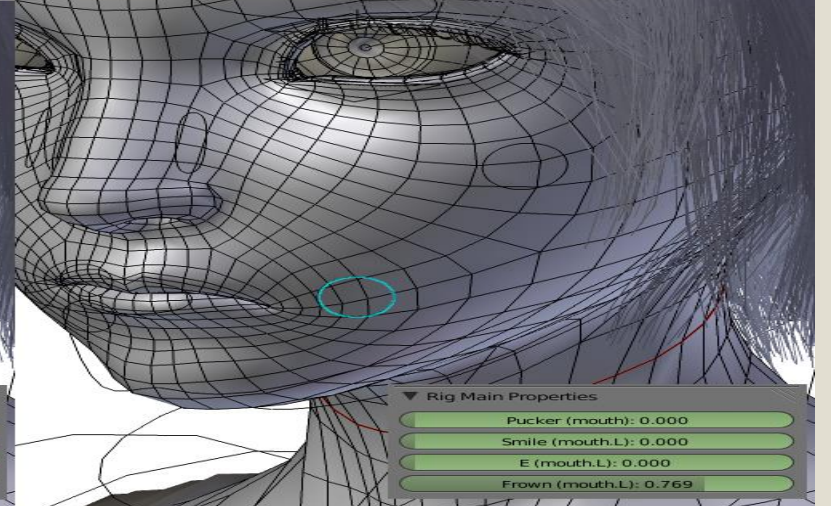
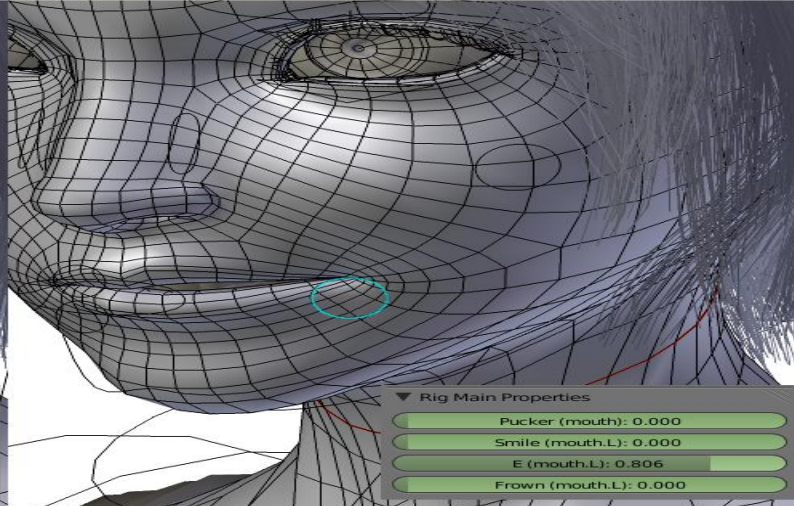
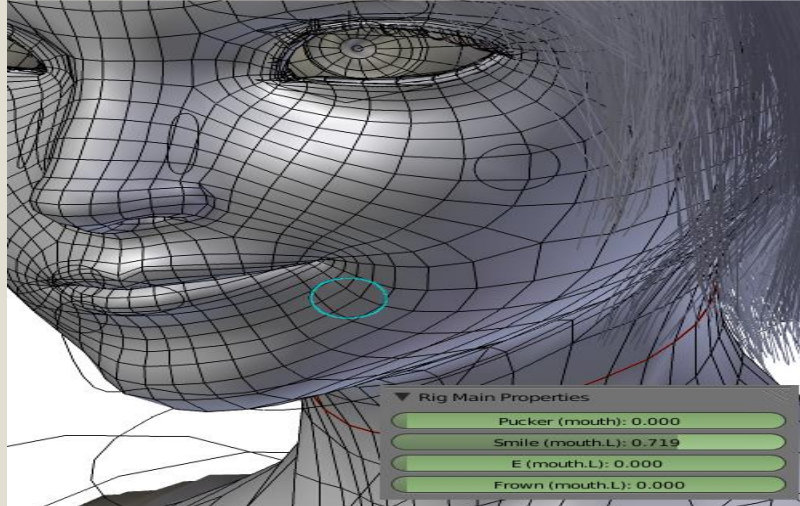
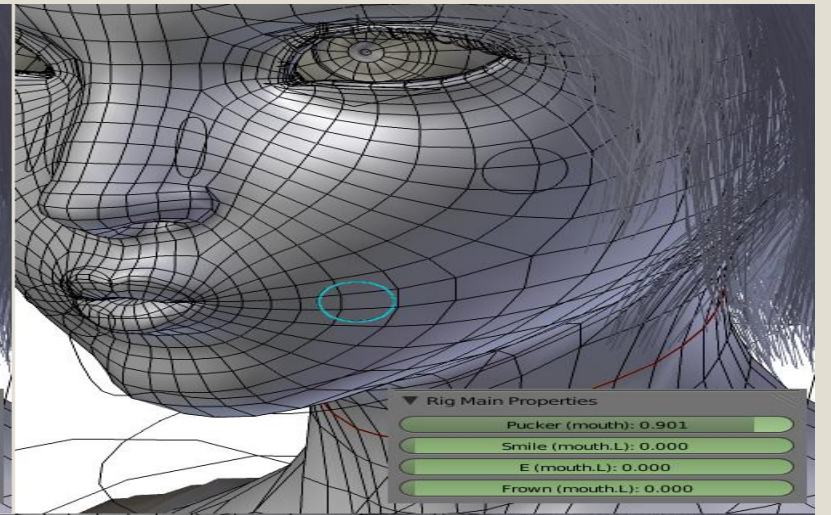
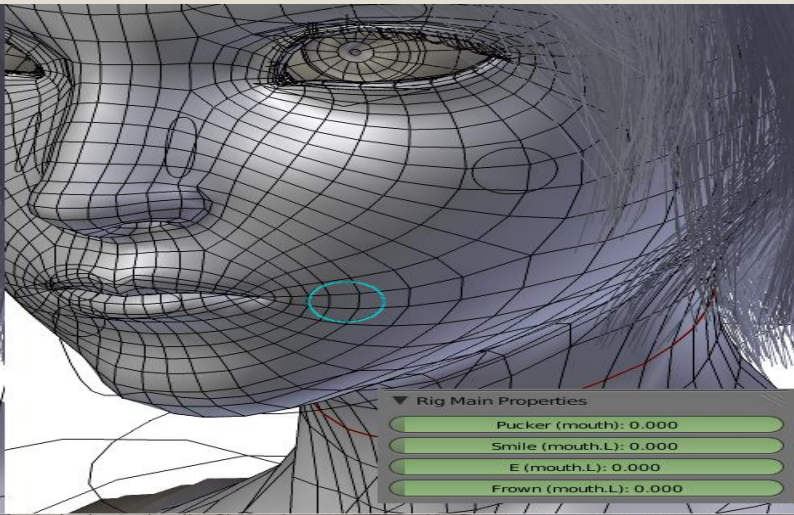
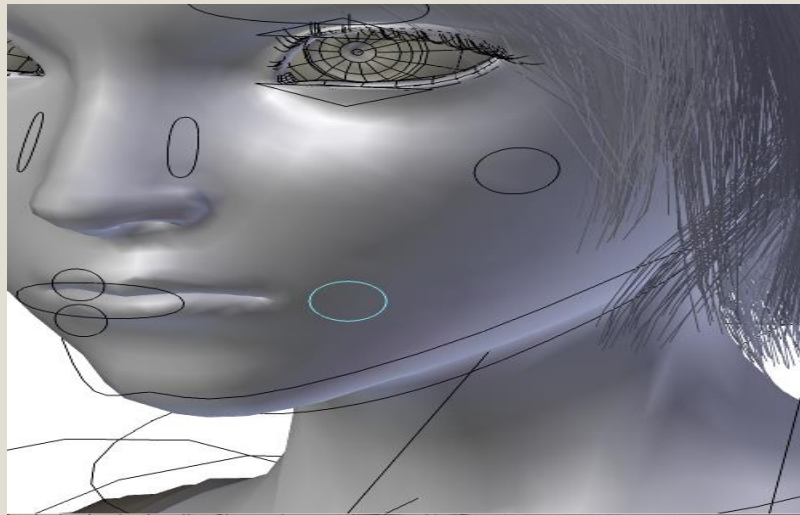
III Year / V Semester

Unit 3 – VIEWING AND VISUAL REALISM

Topic :Morphing



MORPHING





BRIEF INTRODUCTION

- Morphing – derived from the word metamorphosis.
- Metamorphosis means to change shape, appearance or form.
- Example:





WHAT IS MORPHING?

- Morphing can be defined as:
 - Transition from one object to another.
 - Process of transforming one image into another.
- An animation technique that allows you to blend two still images, creating a sequence of in – between pictures that when played in Quick Time, metamorphoses the first image into the second.

Image 1



Image 2



Intermediate Images





HOW IS MORPHING DONE?

- As the metamorphosis proceeds ,
 - The first image is gradually distorted and is faded out.
 - The second image starts out totally distorted toward the first and is faded in.

Steps Involved:

- The morph process consists of :-
 - 1) Warping two images so that they have the same “shape”.
 - 2) Cross dissolving the resulting images .



WARPING

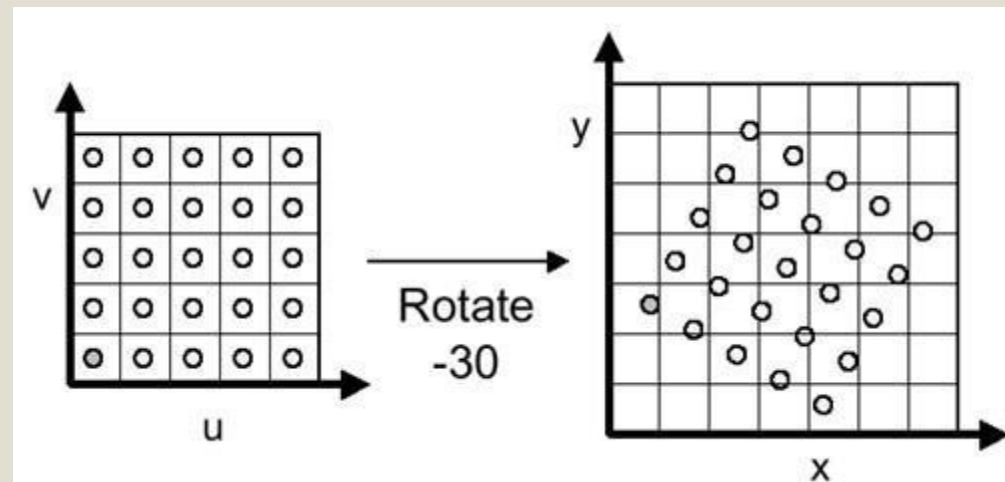


- A warp is a 2-D geometric transformation and generates a distorted image when it is applied to an image.
- Warping an image means : apply a given deformation to it.
- Two ways to warp an image:-
 - Forward mapping.
 - Reverse mapping.



Forward Mapping

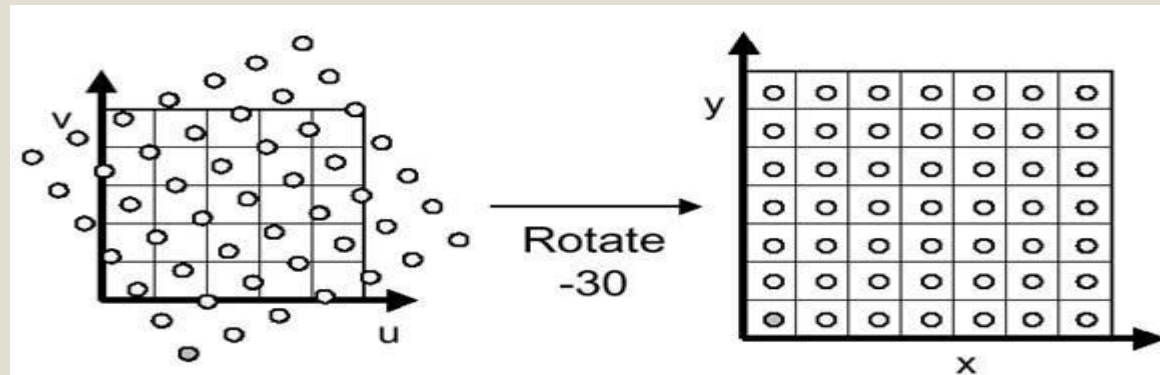
- Each pixel in source image is mapped to an appropriate pixel in destination image.
- Some pixels in the destination image may not be mapped.





Reverse Mapping

- This method goes through each pixel in the destination image and samples an appropriate source image pixel.
- All destination image pixels are mapped to some source image pixel.
- This mapping is used in the Beier/Neely line morphing method.





Cross Dissolving



- A cross-dissolve is a sequence of images which implements a gradual fade from one to the other.



THE MORPHING PROCESS

- Morphing Process
- Step I : Interpolating the lines:
 - Interpolate the coordinates of the end points of every pair of lines.
- Step II : Warping the Images
 - Each of the source images has to be deformed towards the needed frame.
 - The deformation works pixel by pixel is based on the reverse mapping. This algorithm is called Beier-Neely Algorithm.



Beier-Neely Algorithm

For each pixel $X=(x,y)$ in the destination image

$DSUM=(0,0)$, $weightsum=0$

for each line(P_i, Q_i)

calculate(u_i, v_i) based on P_i, Q_i

calculate (x_i', y_i') based on u, v and P_i, Q_i

calculate displacement

$D_i = X_i' - X$ for this line

compute weight for line(P_i, Q_i)

$DSUM+=D_i*weight$

$weightsum+=weight$

$(x',y') = (x,y)+DSUM/weightsum$

color at destination pixel(x,y) = color at source pixel(x',y')



Morphing Software

- There are many morphing softwares available on the internet:
 - 1) Morph Man 3.1
<http://www.stoik.com/morphman/morphman.htm>
 - 2) Morpheus Software
<http://www.morpheussoftware.net/>



Thank you