

The Alias PA face modelling tutorial



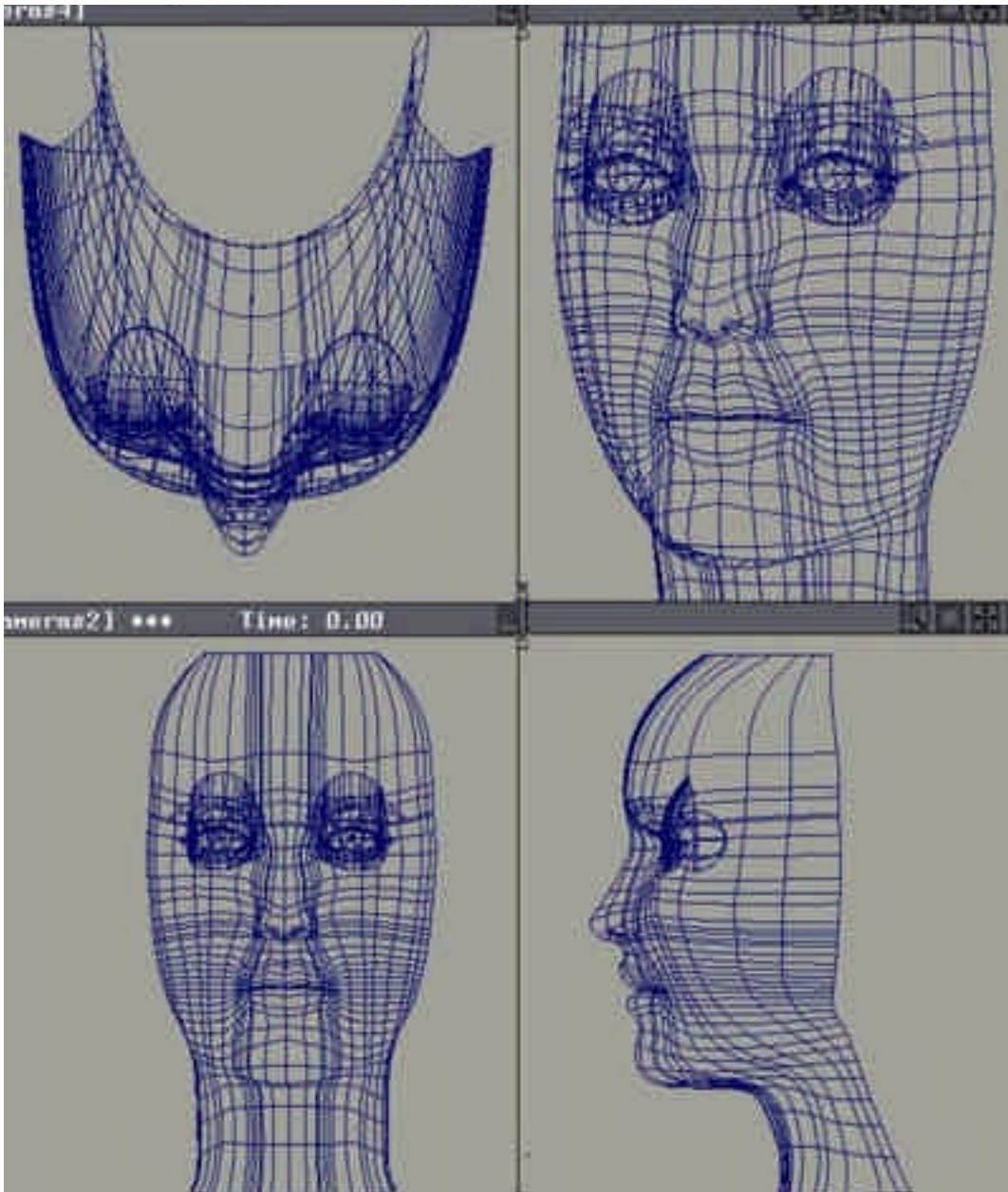
Test image of my virtual actress; here I was checking jaw and upper eyelid movement.

Introduction

Hello, I'm Steven Hägg-Ståhlberg, I was born in Adelaide Australia in 1959, and grew up in Sweden where I studied fine art. During the time that I wrote this tutorial I was living in Hong Kong, working as a professional CG artist and Illustrator; I now reside in the USA. Back in 1991, I bought a used basic 4D20, with some free demo software by Alias and Wavefront. I then found Alias Animator, and later moved on to Power Animator which I use to this day. This tutorial works best if you have Alias PowerAnimator, although it will likely be of value to people using other software like Softimage, Maya, Rhino, etc. For those of you just starting off or who require more general CG advice, check out this page: **About Computer Graphics**

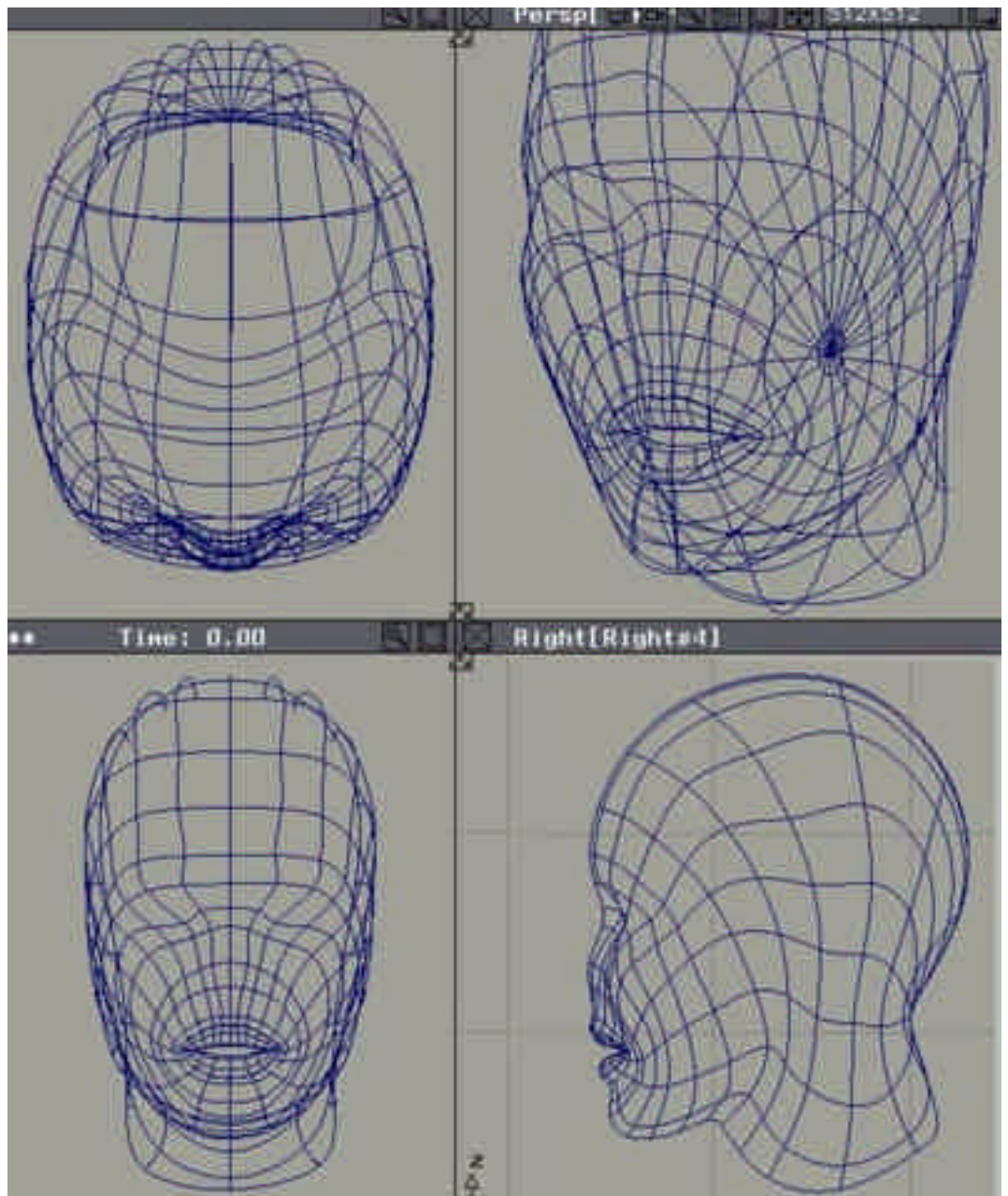
Modelling a face

First off, we will look at the topic of parameterisation, that is, how the isoparms (isoparametric lines, for more information check the user manual) are organized; this is much more important with NURBS than polygons. The screenshot below shows an approach based on a square grid going from top to bottom, left to right.



(Figure A) The screenshot on the left shows a face constructed with a typical North/South pole parameterisation.

(Figure B) The screenshot on the right shows a face constructed using a front/back, radial/circular parameterisation method, with one pole placed in the mouth and the other in the nape of the neck:



Research and development on my models is an continual process. There's an elapsed period of 5 years between these 2 wirefiles. This is what the North/South wirefile looked like 1993 (below left), and the Radial one looked like in 1998 (below right).



Multiple component vs single component surfaces

Overall, I prefer the radial (circular) parameterisation method. In addition, another choice you will be confronted with when using NURBS (not h-splines) is: do you make a multiple component surface (mc), or a single component surface (sc)?

The mc face consists of many separate surfaces, usually blended with each other using special blend-surfaces with construction history (so they update and follow all deformations). In the sc face everything is a single surface - the ears, the nose, the eyelids and so on.

Some people prefer the sc type because they (rightly) fear the blends with construction history. (The reason being, that they are extremely slow in updating, and produce uncontrollable surfaces prone to wrinkling.)

I prefer the mc type WITHOUT CONSTRUCTION HISTORY BLENDS (let's call it mc-plain), because the sc type has problems with wrinkles in areas where the isoparms bunch up, for instance at the corner of the mouth. The nostrils also contribute a lot both in the U and V directions, and the ears, and the eyelids. Look at the screenshot (Figure A) shown previously - see how much denser the isoparms lie, and it's not even a complete sc; just imagine how dense it would be if you'd try to merge the ears and the eyelids with the face as well! Note that to have a proper opening mouth, not just a shallow dip between the lips, you'd need even more isoparms. As you can imagine, this is an impossible method to animate.

Maybe you're wondering 'how can you have blends without construction history when animating?' Don't worry, it's all part of the magic of illusion and I'll show you how this is done a bit later in the tutorial!

The only disadvantages to an mc surface head is that in some parts of the face you have more editing work, about as much as with a single-surface, and you have more shaders to contend with and so obviously more shading work.

To recap: the advantages of using an mc-plain type radial head are that it produces a smaller file-size, updates more quickly, is easier to edit and change, and easier to animate. (Of course with Hierarchical B-splines, or h-splines, a single surface would be the way to go, so if you have access to that sort of technology, skip the steps in this tutorial which relate to blending together the separate surfaces.) In the next section I'll show you step by step how I go about constructing a female head.