Animated Skull

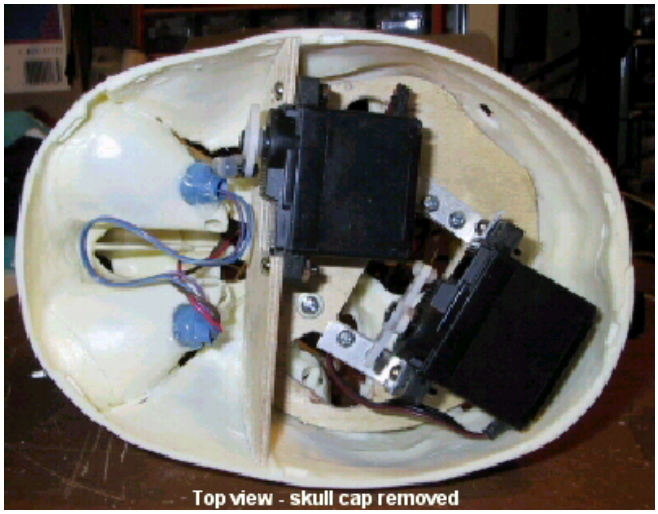
I thought it would be cool to make a skull that could speak to the kids as they approached the house... I ended up doing quite a bit more than that. The skull I made for Halloween 2000 has a moving jaw and it rotates and tilts by remote control. The glowing red eyes can be turned on and off by remote control as well.

As you can see, I used the skull to make a Grim Reaper. As people came up to the house, the Reaper (with my altered voice) turned his head and welcomed them to my haunt. This freaked a few people out ! The kids were fascinated by it - they would come up, look at it, talk to it - and I talked back to them thru a speaker under the Reaper's robes.

The head motion is controlled with an airplane or car remote control unit. Its actually quite eery to have a skull turn its head and look at you with devil red eyes - then open its mouth and laugh insanely ! Its a great effect, but a bit complicated to build. If you have to buy everything including the radio control unit it would cost you $250 or so.

I started with a Skillcraft human skull model which I assembled leaving out a few of the inside parts which would get in the way of the robotics. Since I'm an R/C plane pilot I decided to use servos to move the jaw and skull. I cut thin plywood to the shape of the inside of the skull and glued it horizontally behind the eye sockets. The head tilt servo was mounted to this piece on aluminum brackets as you can see in the photo. A second piece of plywood was used to mount the jaw servo (its the upper one in the photo below).

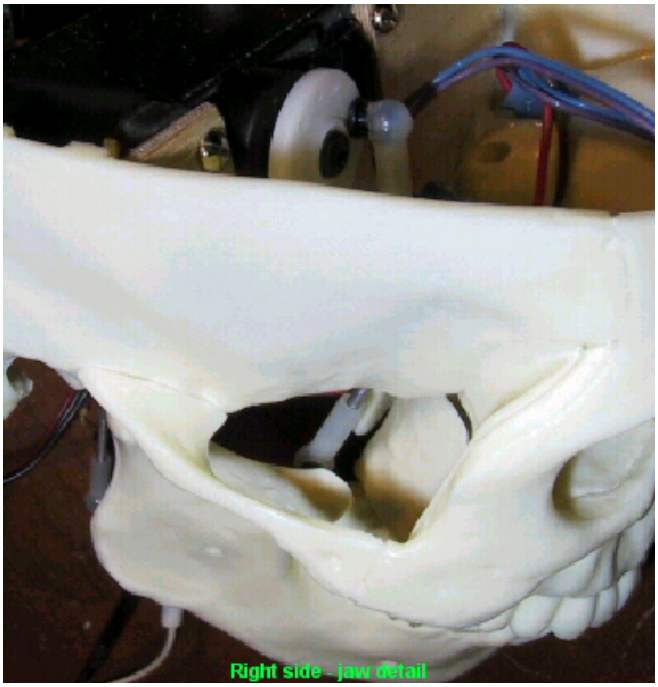
The blue things with wires are heat shrink tubing with #47 incandescent bulbs inside for the glowing eyes. The red eyes are plastic jewels as used on front panel pilot lights.



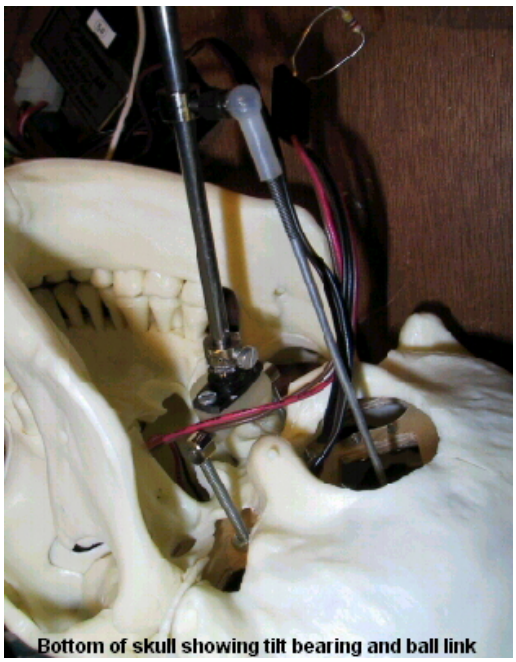
Top view - skull cap removed

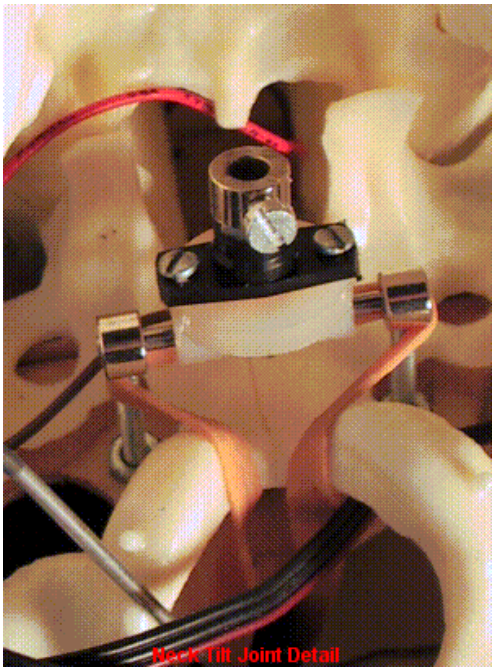
The photo below shows some detail of the jaw servo mechanism. The servo wheel is attached to the jaw using ball joints and threaded rod which can be obtained from any good R/C supplier. The ball joints allow both ends of the rod to move freely -

necessary because of the odd angles at which servo and jaw move. A ball joint is screwed into the inside of the jaw where it wont be seen - you can see the white nylon socket thru the side of the skull in the photo below



The next task was to mount the skull so it could rotate. I originally mounted a servo in the skull with the output arm pointing down as the “neck” - you can see the hole I cut for it in the top view photo. While this did work, the skull and servos are heavy enough that any jerky motion in the servo caused the skull to shake pretty badly. I decided to make a tilt/rotate joint and couple the servos to the skull with pushrods. This worked perfectly. The joint is a bit tricky since there are two axes of motion to consider. I ended up mounting the tilt servo in the skull (seen in top view above) and the rotation servo is mounted to a wooden base that forms the shoulders of the Grim Reaper. The tilt bearing is made from parts of a Du-Bro V-Tail Mixer used in R/C airplanes. It is mounted on a music wire shaft which serves as the “neck”. The wire shaft goes into a Goldberg nose gear mount (R/C airplane stuff again) which is basically a bearing in which the wire turns, coupled to the rotation servo with a control horn and pushrod. The tilt servo couples to the “neck” wire via a ball link. I’m sure other parts would work, this is just what I had on hand to work with. You could probably achieve the same results by using R/C cable links too. This is probably very confusing, so look at the picture !




Neck Tilt Joint Detail