Photogrammetry TPU Rubber Earplugs

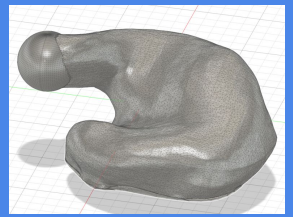
Problem:
I have tinnitus, which I inherited from my father and did *not* get blasting my eardrums with loud music thank you very much. I can't cope with being in particularly loud areas for long amounts of time. I wanted comfortable ear plugs, that let in a little bit of sound- which I could wear all day.

Design:
I had an idea to build ear plugs which conform to my inner ear. I used safe modeling foam to make a mold of my inner ear, which I 3D-Scanned on a little rotating table I built for photogrammetry. I made the resulting mesh smaller, cleaned up the backside of it and added a ball end.

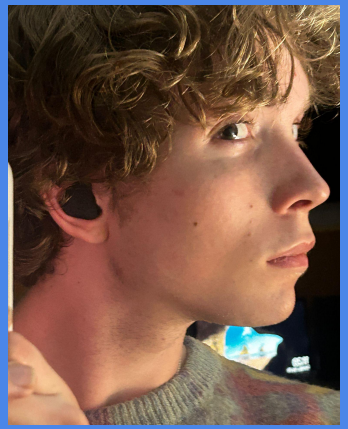




Build Process: I 3D Printed the piece in TPU 95A. I prototyped a couple of different infills and layer heights. I settled on a 0.12 mm layer height and a 65 percent infill. After I was done printing each earplug I heated them each up with a solder reflow machine to get a smooth texture







Results/Retrospective:
I learned later that similar projects do exist, so please keep that in mind. The end result works great, it's a fairly simple project. I do use them, and I will definitely be remaking these soon with labels