

Abstract

I would like to create the perfect motorcycle helmet made to fit the head of a specific person better. I am gearing my ideas more towards motorcyclists as I am one and when I'm on my bike with my head phones in and with my glasses on I notice they tend to not stay in place and are affected by the wind/ sun and other things. The helmet would have an HUD with a display similar to Google Glass but would not interfere with riding the bike.

Research Question

How can I use 3D scanning to perfectly fit a motorcycle helmet to the specific shape of a riders head while making the design practical and innovative as well?

Precedents and Prior Research

- Recently a company called 'Skully' began prototyping and Beta testing helmets that have the HUD I am going for in this project.
- Helmets are usually sized XS, S, M, L, XL..etc and the sizes are based on the circumferences of an "average" persons head. But just because some people have the head circumference doesn't mean their head are the exact same. Most helmet designers don't take that into consideration.
- So, measuring your head is the starting point for the entire sizing procedure. Due to varying head shapes, heads that are apparently the same size when measured by a tape measure may not necessarily fit the same size helmet and each manufacturers helmet can size differently.
- Internal helmet shell structure on poorly designed helmets can have protrusions or shapes that press through the padding and into a sensitive area on your head and cause pain, rawness and headaches, so ther should be no pressure points
- Google Glasses make hands free driving more feasible and because riding on a motorcycle it is even more dangerous to have to deal with a phone or navigation system a helmet would help tremendously.

Process

- I 3D scanned my own helmet on the iPhone app 123D Catch. It didn't come out great but after exporting I somewhat used this to design the rest of the helmet in rhino.
- I kept the design rather simple to make it versatile when adjusting for size.
- I used an image off Google to give a somewhat accurate look to what the HUD would look like.
- I exported both STLs and 3DM files and uploaded them to the que to be printed on the ZCorp Machine.

Results

By using 3D scanning as the basis for my design I have come up with a way other companies can make better helmets that actual cater to fit each rider which in return could actually make them safer to use.

Conclusion

Overall I am happy with how my helmet came together and turned out. The helmet looks very realistic and practical. I would see my product on the market and used by many people.

References

Skully Helmets Promo - <https://www.youtube.com/watch?v=b7AYfq9uIY8>

Skully Helmet Site- <http://www.skullyhelmets.com/heads-up-display-motorcycle-helmet-beta/>

Head Shape Variations- <http://www.webbikeworld.com/motorcycle-helmets/head-shapes/motorcycle-helmet-head-shapes.htm>

Textures- Google Images