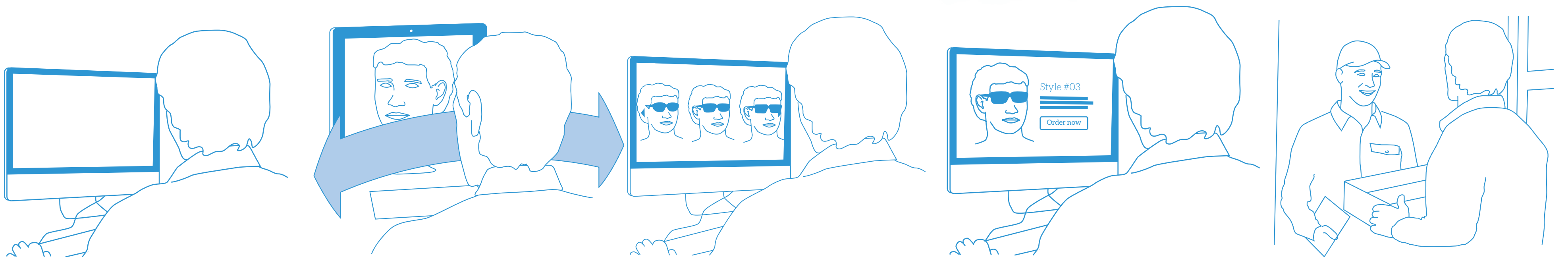


Design of custom fitted sunglasses

The aim of the Rayon project is to develop a service that is able to produce customized sunglasses that fits individual users based on AM techniques.

To develop this service, several technologies have been analyzed to come up with a concept where it is possible to remotely scan a head with a simple camera using Structure From Motion (SFM) principles.

Also anthropometric data is analyzed to find the sizes that make a pair of sunglasses fit well to a head.



Visit the website
To order a pair of sunglasses the customer must visit the Rayon website & start the ordering process on the homepage or one of the product pages

The first step in the progress is to make a video of the head. The user must begin with his or her head right-sided profile and turn 180 degrees to left-sided profile in 30 seconds.

All available styles will be presented to the customer on his or her own head. The user customer can browse the styles to find the style he likes most.

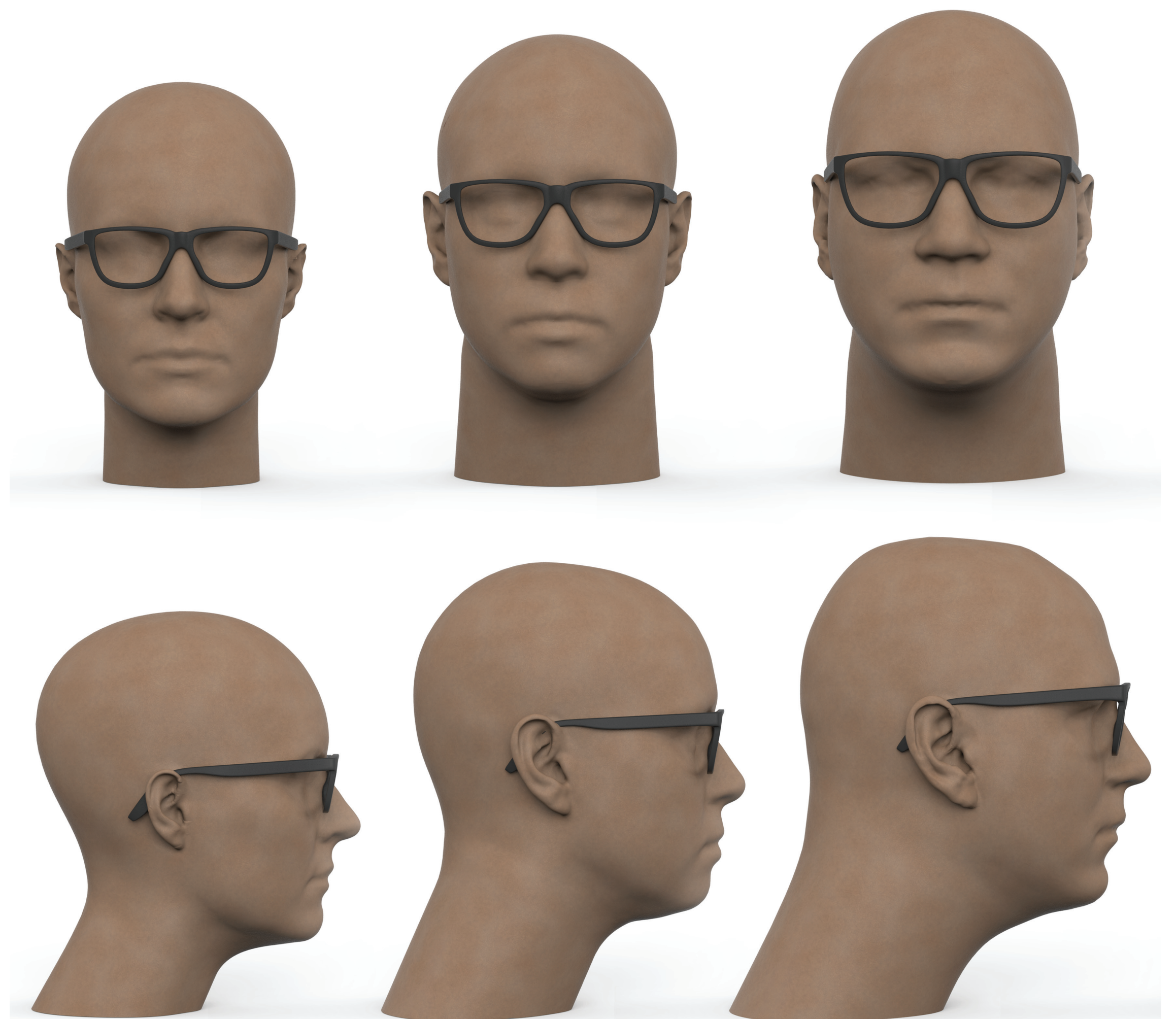
On the product page of the style the customer likes most, he can select a style by ordering this model. Next the order can be finished like a regular web shop order.

When the product is finished it is delivered at the customer's house. All he or she has to do is accept the package.

To verify the design proposal, a fully functional parametric prototype is made of the design. This prototype is made in Rhinoceros with the Grasshopper and T-Splines plug-ins.

The prototype is fitted on five headforms provided by The National Institute for Occupational Safety and Health (NIOSH). The headforms are based on a United States nationwide anthropometric survey of 3,997 subjects in 2003. Based on this survey the NIOSH has made facial scans of five real people that resembles five distinct head sizes. The first goal of the evaluation is to verify whether the prototype is able to fit the five different headshapes properly.

The result of this functional evaluation is positive. As can be seen in image on the right the prototype is able to fit all five of the headforms properly and the design of the frame is still recognisable as the same model.



Rutger van Wijngaarden
Design of customizable sunglasses
based on additive manufacturing Techniques
09-05-2014
Integrated Product Design

Committee

Company

Dr. Y. Song
Ir. A. de Smit
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The logo for TU Delft, featuring a stylized flame icon above the text "TU Delft".