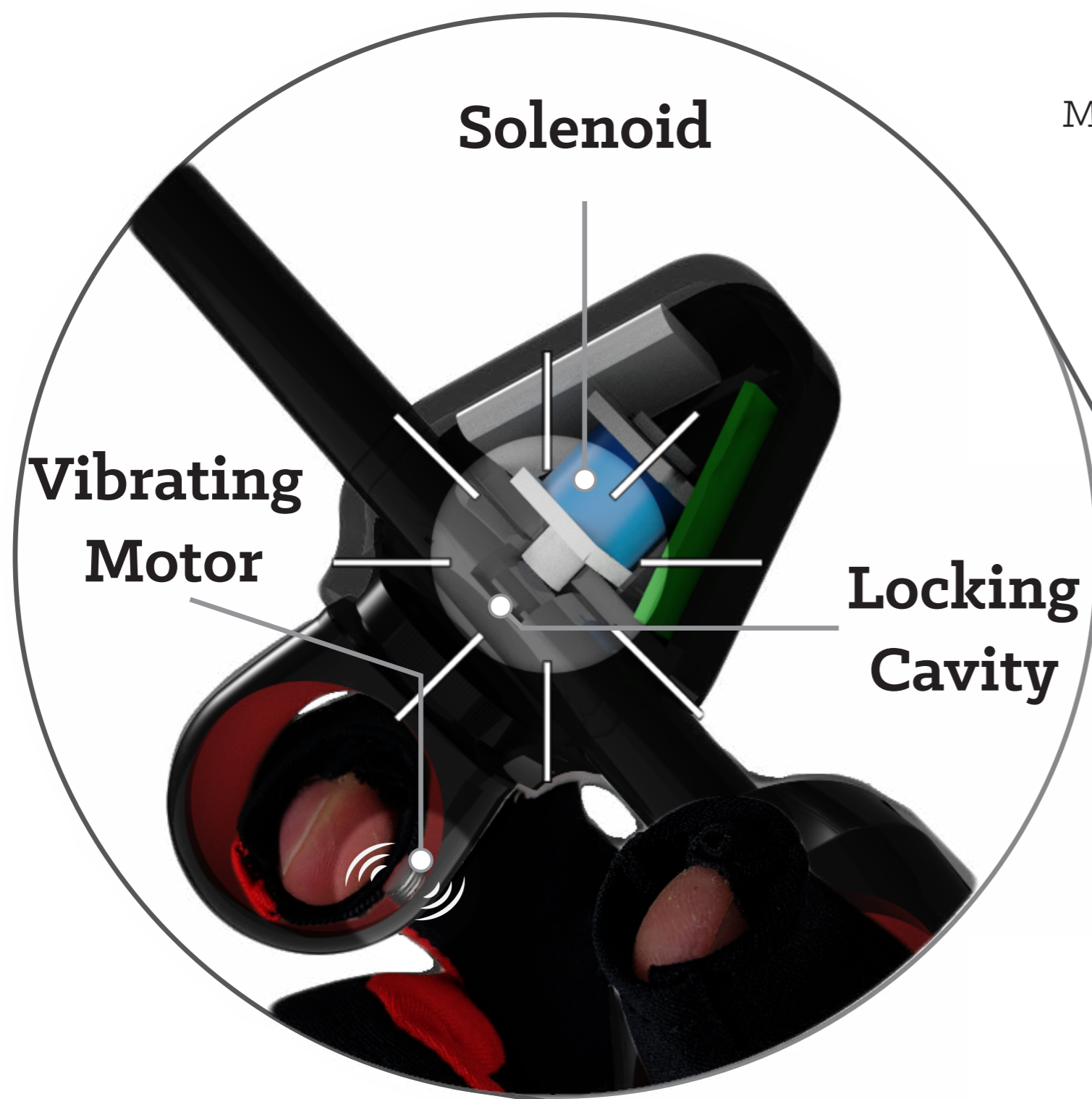


DESIGN IN VR

The creation of a haptic feedback device for improved interaction with VR CAD environments using the Manus VR Gloves



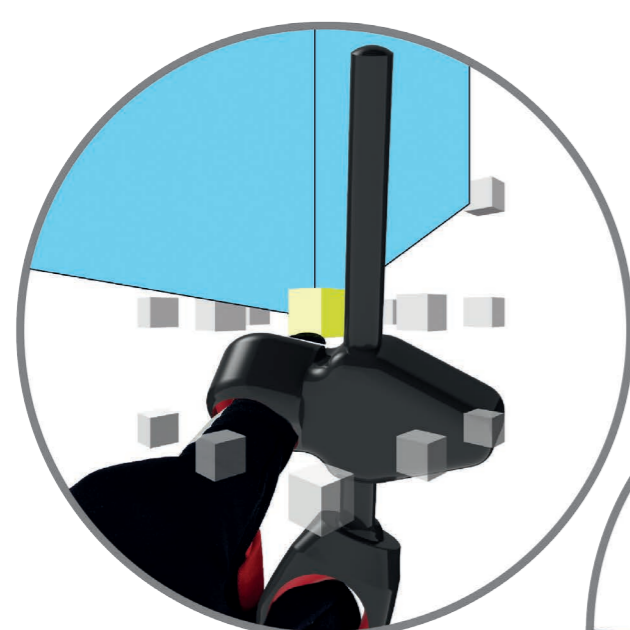
Modern Virtual Reality devices can not only entertain consumers, but can also be put to professional use by businesses. One such area is Computer Aided Design in VR, which potentially has many advantages over CAD on a computer screen, such as seeing your model right in front of you in three dimensions, on a true scale. This will make it easier to (collaboratively) work on models and evaluate them more accurately.

What could be even better is the ability to directly work on these models with your hands. Using the gloves made by the Eindhoven based company Manus VR this is now possible, as it can track your hands and individual fingers in VR. However, one downside is that the interaction is still only virtual. Haptic feedback can be added to make working in VR CAD more intuitive.

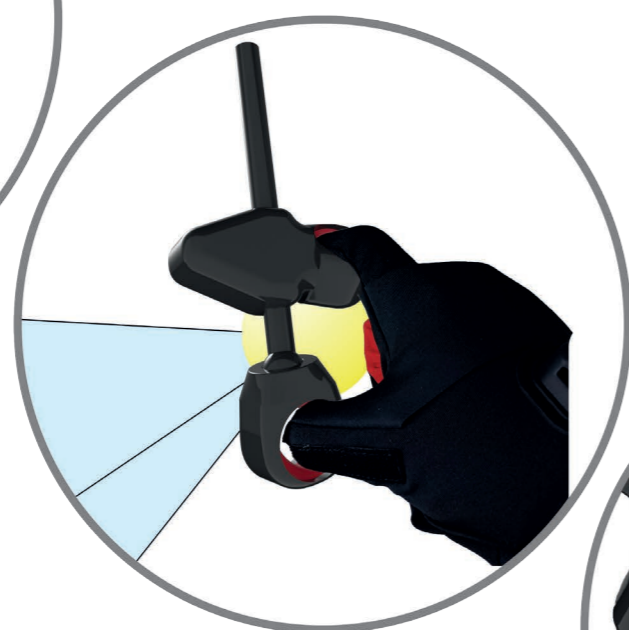
THE PRODUCT

The feedback is added with the designed product, with a focus on three important interactions for VR CAD. First, the point grid interaction, which is present for designers to create models with accurate measurements. When selecting a point using your index finger, a small vibrating motor embedded in the product will give you feedback.

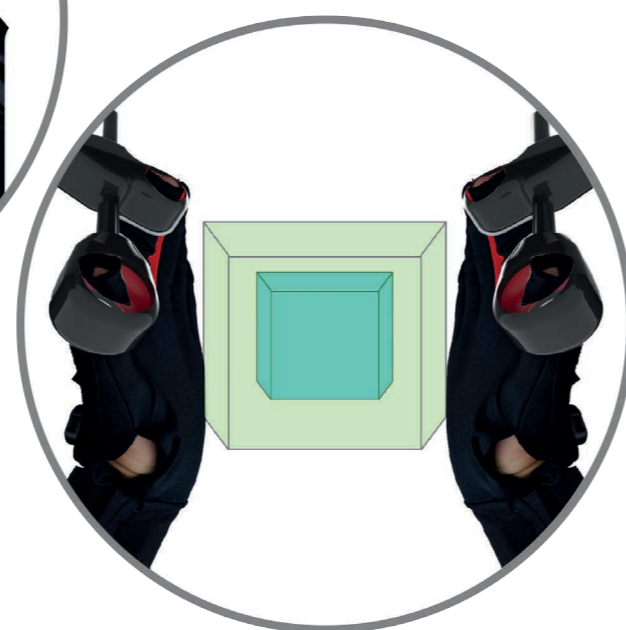
Secondly, the adjustment of models, where the corners of models can be grabbed and moved to another point on the grid. The solenoid locking mechanism creates the feeling of actually grabbing the corners of the model for the user. And finally, the scaling of models, which uses the vibrating motor in the gloves to indicate contact with the sides of the model, which enables to user to change its size. These implementations of haptic feedback create an intuitive and faster interaction in VR CAD.



MAKE



ADJUST



SCALE

Tim Bakker
Design with Hands:
Haptic feedback for a virtual reality dataglove
21-06-2017
Integrated Product Design

Committee Dr. ir. Jouke Verlinden (chair)
Dr. ir. David Abbink (mentor)
Roel van Deventer, MSc (company mentor)
Company Manus VR

**TU Delft**