

Augmented Reality as a Design Tool

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The designing and prototyping of an Augmented Reality or AR design tool. This assignment was proposed by the University of Twente's Design Engineering group, a group within the Design, Production and Manufacturing department of the University. The Design Engineering (or DE) group is interested in keeping design tools up to date and helps students and companies fulfill their engineering tasks. With the addition of the Microsoft HoloLens they wish to explore if it is possible to design an augmented reality tool which can benefit Design Engineering. According to them, students are capable of coming up with solutions that they might overlook. Therefore, this assignment was offered to Industrial Design students at the University of Twente.

The assignments objective contributes to the field of Design Engineering by making the Microsoft HoloLens a more accessible tool to students and companies in the field of engineering. It also hopes to contribute to the public identity of the Microsoft HoloLens and Augmented Reality at the University of Twente. With the development of a relevant design tool it can contribute to further exploration and use of the possibilities of AR.

To develop a useful and relevant new Design Tool making use of Augmented Reality knowledge about the Microsoft HoloLens and important side information was gathered. Information on the possibilities and functionalities helped create and brainstorm for ideas whereas information on the Virtual Reality Lab at the University of Twente helped formulate criteria for these ideas. With the help of these criteria a relevant concept is chosen and further developed. With user interface design research supporting the decisions of the designer a concept for the AniMate application is defined. Extending the visualisation, communication and interaction possibilities that the Microsoft HoloLens offers by developing a framework for the animation of 3D models realises the goal of creating a relevant design tool for Design Engineering. With the help of prototyping and Usability testing the outcome of concept development is evaluated and recommendations are made. Testing showed that users believe the AniMate application to be a successful addition to the VR-lab toolset and verifies the designers vision that a design tool for animation can help users produce results within two hours of working. The positive results of this test are promising as the prototype has many flaws that can potentially inhibit usability and effectiveness of the application.

Being limited by programming knowledge and time the designer could not develop a prototype which resembled the developed concept close enough to confirm all assumptions made regarding the usability of the application.

With the AniMate application a useful design tool capable of being used both by the DE department and VR-lab users has been developed. By investigating the possibilities of Augmented Reality and the usage/users of the VR-lab a tool which extended the functionality of the Microsoft HoloLens was made to benefit Design Engineering. To benefit fully from the AniMate design tool work will have to be done on several aspects. The usability of the developed concept can be improved by looking at design decisions made for other HoloLens applications along with developing and testing a more resembling prototype. To realise correct usage of the AniMate application it is also recommendable to further develop a user manual with video support including error resolving instructions. Furthermore it is recommendable for any reader partaking in a similar assignment to invest more time in contacting different experts on design engineering and augmented reality to reach a more broad idea generation.

