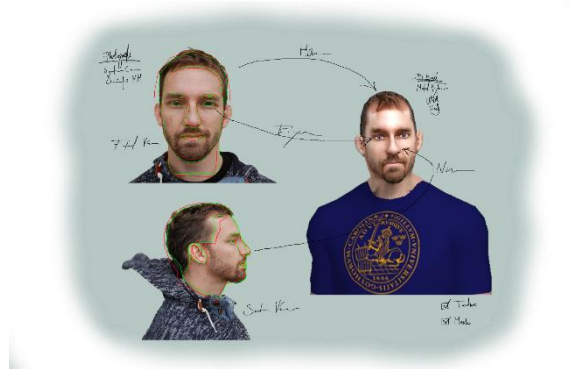


Selfie to Avatar

Creating a 3D Model of a Face from Front and Side View Photos



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In computer games player avatar creations become more and more advanced to the point where they are almost able to recreate a real life person, given enough time. Many players seem to spend hours trying to recreate themselves in order to be the hero of the game they are playing. Enter Selfie to Avatar. Rather than spending hours creating an avatar that will remind the player of herself, the Selfie to Avatar system takes two photos of the player and constructs a 3D copy of her.



Figure 1 Process overview. Top row: Photos where the algorithm has determined the shape of the face from two views. Bottom row: The resulting avatar.

By using image analysis techniques, the algorithm finds the shape of the users face in the photos, one from a front view and one from a side view. This determined shape is applied to a 3D model of a generic face. The algorithm then projects the face pixels to the texture of the 3D model giving the finished avatar not only the correct shape but also the correct color. The result is a finished 3D model avatar that is animated and ready to use in any game or application. The developer of each app must of course implement a client package to interface with their own system so unfortunately the avatars cannot be directly used by existing games unless their developers take the time to do this implementation. Given the improvement of immersion offered by being able to play a game as yourself it is likely that game developers in the future will be forced to implement some type of automatically created user-like avatars.



Figure 2 Examples of two generated avatars used in a game.

The results were tested by letting respondents try to match real world faces to their corresponding avatars. 82.7% of the faces were matched correctly. In its current state the algorithm does very little to properly model hair. It does not take the shape of the hair style into account in the final model and thus only use the color of the hair. If the volume of the hair style could be modeled as well, the recognition rate would probably increase drastically. This observation is further supported by the fact that the recognition rate was lower for women than for men, probably due to women more often having hairstyles with more volume. Properly modeling hair is thus the most important future improvement of the algorithm.



Figure 3 Some examples of male avatars generated by the algorithm.



Figure 4 Some examples of female avatars generated by the algorithm. Note how the hair in the avatars lack volume.

Who knows, in the future we may be playing games where we and our friends and family are the characters? Maybe we will even be “hanging out” online in 3D worlds populated by our exact copies? Maybe businesses will be able to operate without offices as the employees can interact in virtual reality represented by their avatars? Regardless of what the future brings the creator of this algorithm hopes to have helped with one step of the way.