

Showroom Furniture comparison and viewing using Augmented Reality

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Project Description :

The Project goal is to create an Android based application that allows customers in furniture showrooms to take a picture of the furniture of their choice (furniture with cloth fabric) , and replace the fabric in Augmented reality with another fabric of different color and type.

To achieve this, we will need to segment the fabric on the furniture of interest, determine its orientation, and replace it with another texture image using OpenGL overlay. The furniture of interest needs to be contained inside a rectangle view frame to assist color and texture based segmentation and optionally a hint can be supplied by touching the furniture of interest on the Android screen. The texture based algorithm may need to work in a normal cluttered showroom environment and some colors may match with what is on the fabric of the furniture of interest, but we can assume there is no obstruction to the furniture in view.

Here is a sample image :



The initial color and texture based segmentation could be done using a reference fabric image, to generate the Gabor filter coefficients, generate the descriptor vector, and then use them to compare with the image taken from the Android camera. Reference fiber images at different rotation angles (done through OpenGL or take pictures at different angles) can be used to get the closest match for dominant angles of the furniture. The same transformation is applied to the new fabric before it is augmented to the furniture, preserving same luminance values.

Alternately, a 3D block model of the furniture could be created, to identify the different planes and hence the orientation of the texture.

1. D. Zhang, A. Wong, M. Indrawan and G. Lu, *Content-based Image Retrieval Using Gabor Texture Features*. Gippsland School of Computing and Information Technology, Monash University.
2. Recovering Free Space of Indoor Scenes from a Single Image Varsha Hedau
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3. W. Niblack et. al. "The QBIC Project: Querying Images by Content Using Color, Texture and Shape". Proc. of the Conference Storage and Retrieval for Image and Video Databases, SPIE vol.1908, pp.173-187, 1993