Exploration of Augmented Reality Applications

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Goals:

Inspiration: http://www.youtube.com/watch?v=frrZbq2LpwI

The goal of this project is to explore the applications of augmented reality. Initially, we would like to develop a system that is capable, in real time, of recognizing a visual marker in a video stream, computing the transform from camera space into the reference frame of that marker, and replacing the marker with some other image (mostly inspired from [Rekimoto 1998] and the inspiration video linked above). This will serve as a baseline of the system.

From there, we hope to be able to build a more interesting application based on this system. We have two options that we are currently considering:
1.) Rendering live video in a scene. It would be similar to the newspaper example in the above video: recognize a marker, e.g. on a newspaper, and replace it with a relevant live video.
2.) Adding 3-D objects in a scene. The example we have in mind is a product box with a marker on it: when shown to our camera system, a 3-D model of the product will expand from the box to allow the user to preview it on his/her camera screen.

Once we have the initial marker recognition system in place, we will have a more concrete idea of where we want to take it. The two ideas above are very interesting to us, but we will continue to explore online demos and examples, and brainstorm other possible applications of the technology. Ultimately, we would like to produce an interesting demonstration of the technology that might be useful in a real-world scenario.

Images:
References:


http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4079263

http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=704151&isnumber=15197