HCI Project: Underwater Interaction

Abstract: your goal
Build a gesture-based interaction system that works under water. The goal is to allow divers (recreational, marine biologists, and so forth) to interact with devices using gestures and touch input.

The WiSe 2012 masters project testing their custom-made motion capture suit in a local pool. The overlays show how the software has recognized the markers and reconstructed their position is space.

Background
Traditionally, divers are not able to interact with devices underwater. Unless they wear full head masks and radio gear they communicate using waterproof pens on boards, as well as underwater gestures.
What you will do

Create a gestural interface that works underwater. This will require you to understand motion capture technology, camera systems, write and modify real-time computer vision code, and work with skeletons and inverse Kinematics in order to recognize full body gestures. Placing components underwater (e.g., cameras and speakers) will require some basic material handling skills, such as laser cutting and hardware hacking.

References to get you started

- Watch “OpenNI kinect as3 wrapper skeleton” on Youtube
- Check out the “Underwater Signals” from the ukdivers.net
- Read “A 3D Time Of Flight Camera for Object Detection” by Thorsten Ringbeck

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