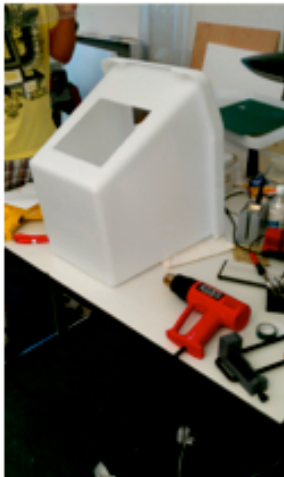# HCI Project: Underwater Motion Capture using Depth Cameras

Abstract: your goal

Build and test **an underwater depth camera based system**, using a custom-made time-of-flight depth camera**.** The goal is to allow divers (recreational, marine biologists, and so forth) to interact with **devices using gestures and touch input, while submerged**.

Your predecessors, the SoSe 2012 masters project testing their equipment in a local pool...

Our lab has teamed up with technology partner *PMD,* which provides pre-release state-of-the art depth cameras. The project will require you to understand the depth camera systems, write and modify, real-time computer vision code 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.


Okay   Stay there   Come here   Going down

Background

Traditionally, divers are not able to interact with input devices underwater. Thus, they are required to carry annotation materials, such as waterproof pens and boards. Furthermore, verbal communication is only available for divers with full head masks and radio gear; hence, **underwater gestures** are very commonly used for signaling messages to fellow divers.

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Masterprojekt Wintersemester 2012

Description: your objective

Create a gestural interface that works underwater. Overcome both software and hardware challenges. Such as: data acquisition from depth cameras, whole body gesture recognition, and also additional hardware challenges, such as **designing cases for submerging gear**, **hacking depth cameras**, water to surface communication, and experimentation with output devices such as **waterproof headphones and speakers.**
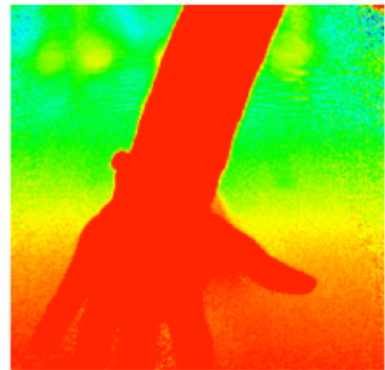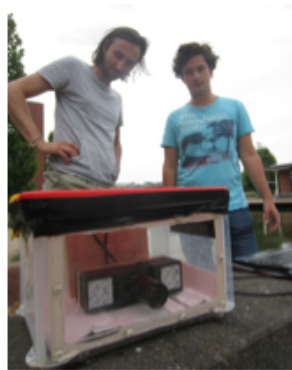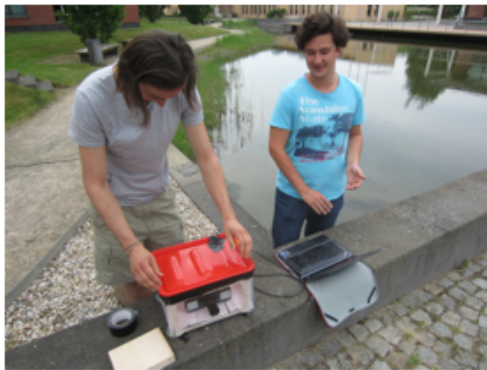
References to get you started

- 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

Contact

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