

Scanning dynamic water surfaces using a Kinect as a sensor

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Idea

The Kinect motion detector, designed for the Xbox 360 game console, is the first mass produced device that incorporates a 3D scanner. Through the efforts of the online hacking community, drivers were developed that allow users to connect the Kinect directly to their computers and use its input for unintended uses outside of gaming.

In hydraulic (laboratory) research, the shape of an entire watersurface is a hard to measure, but a vital variable of interest. In the research presented here it was tested whether the Kinect can provide a low cost sensor for measuring watersurfaces.

Technology

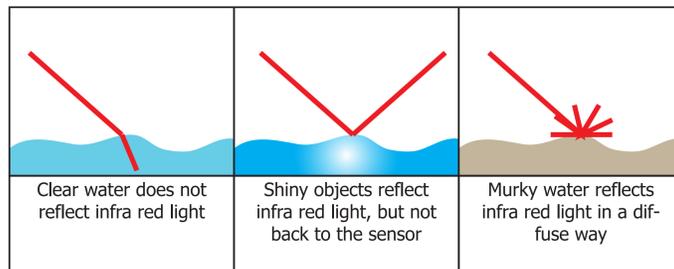
The Kinect uses a structured light scanner: a grid of infra red points is projected by the sensor. An infrared camera looks at this grid under a slightly different angle. Using the distortion of the grid, the hardware can reconstruct a 3D image of the objects on which the grid was projected

intended vs unintended



Limitations

The objects on which the infra red grid is projected must scatter infra red light in a diffuse way for the Kinect to "see" them. This means water has to be sufficiently murky, for example by china clay.



Test it!

The Kinect presented here measures the water surface in the tub. Try making (subtle!) waves and see the effect onscreen. The waves are visible on the screen of the laptop that is connected to the Kinect.

