Pose estimation and tracking with range cameras.

The use of cameras that give range information increases rapidly. One type of cameras is the time of flight camera (http://www.mesa-imaging.ch/), the other type is stereo cameras (http://www.ptgrey.com/products/stereo.asp).

The data generated by the camera is a set of 3D points that describe surfaces that are visible from the camera. These data are noisy or can be unreliable in other ways.

In the M.Sc project the student will develop methods to infer the pose of the human body on the basis of range data from a camera. In particular recognition of body parts (head, hands, feet) will be a central issue. If this is done with sufficient robustness, recognition can be extended to multiple persons and their body parts.

We have the availability of both a time of flight camera and a stereo camera, and thus can provide realistic data.

As a first step the data will have to be separated into background and foreground. The foreground data will then have to be clustered into different objects. As a third step is has to be determined whether it is a person and what the pose of the person is. This will be the largest challenge.

We will use probabilistic methods that are common in our group and use and extend methods that are used in regular or multi camera pose estimation. The application field is natural interaction and gaming.

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