

Gesture-based Dicom Image Viewer Control



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Goal

- To control a DICOM viewer with gestures



How?

- Mouse control
 - Two axes
 - Two buttons
- Wheel emulation



Why Kinect?

- It's new
- Cheap
- Learn something new
- Symbol of Enterface11 :-)



Kinect

- Depth sensor
 - Infrared laser projector combined with a monochrome CMOS sensor
 - 11-bit depth - 2,048 levels of depth
 - Practical ranging limit of 0.7 – 6 m
- RGB video - 640 x 480 px 8-bit
- Microphone array (acoustic source localization)

Technologies

- OpenNI + NITE
- Kinect MEX for Matlab 1.3
- Matlab (Computer vision computing)
- Java (generating mouse and keyboard events)
- ImageJ (DICOM viewer)
- GIT, YAML, Redmine, Facebook

Computer Vision

- Depth image thresholding
- Preprocessing - morphological operations
- Fingertips search => Position + handshape
- Position signal smoothening



Demo

- video1 - DICOM data browsing
- video2 - 3D reconstruction viewing



Conclusion

- We developed a system for mouse control via Kinect
- Works well on lower screen resolutions
- General - usable for any application controlled by mouse



Team

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