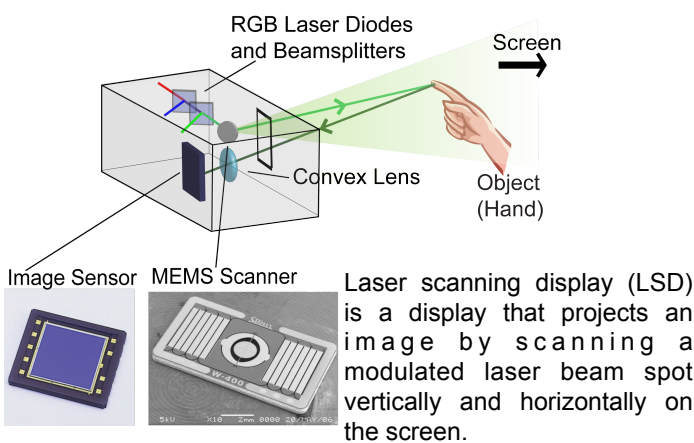


A MEMS INTERACTIVE LASER PROJECTION DISPLAY WITH A BUILT-IN LASER RANGE FINDER

S. Jeon, H. Fujita and H. Toshiyoshi

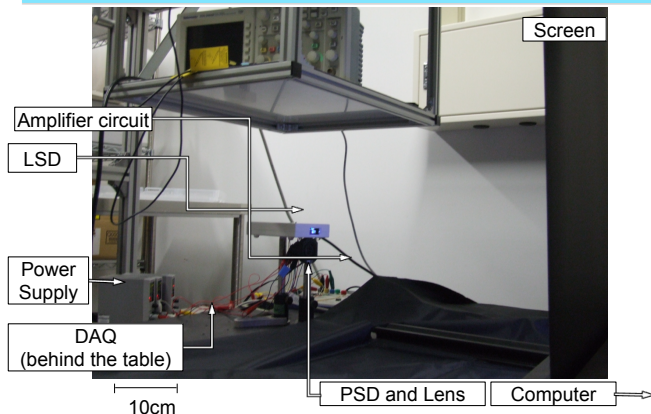
We demonstrate a novel portable interactive display using a MEMS optical scanner for both of display and sensing. While an image is displayed by 2D-raster scan and high speed modulation, space profile data is acquired by laser range finder inside the device.

Introduction



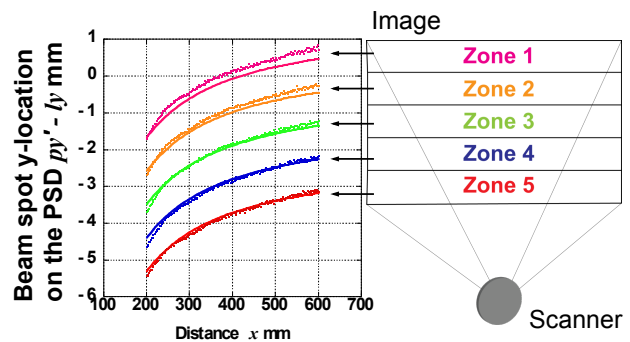
LSD is as small as cigarette case and it gets smaller. It overcomes the limitation of the LCD : Device cannot be smaller than display size. To make this display interactive, a proper input device is needed. Here we propose a 3D profiling system for gesture capture. This is built by adding just an image sensor to the display.

Experimental setup



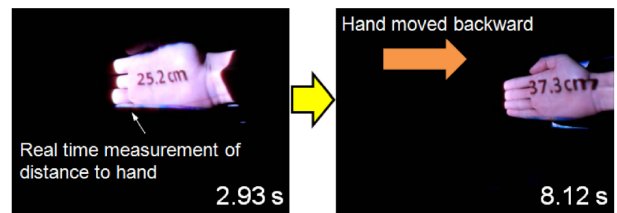
An image sensor (PSD : Position sensitive detector) is located under the LSD for triangulation. The output from the PSD is converted to digital signal by data acquisition device(DAQ) and transferred to the computer. Data readout is synchronized with the scanner movement to know the timing of the readout Computer is used to calculate distance and make feedback to the display.

Result



Y-axis shows the Beam spot location on the PSD calculated from the PSD output. Measurement is synchronized with the scanner movement so distance of multiple area can be measured. If the area gets small noise increases. Dots are measurement and lines are calculation result and as shown in figure above dots were on the lines.

Conclusion



We proposed and built an interactive display based on laser scanning display and laser range finder that is able to input commands by hand gestures.

One cm distance resolution was shown within 60cm distance. Noise problem should be solved to make higher plane resolution.

Contact: name@iis.u-tokyo.ac.jp