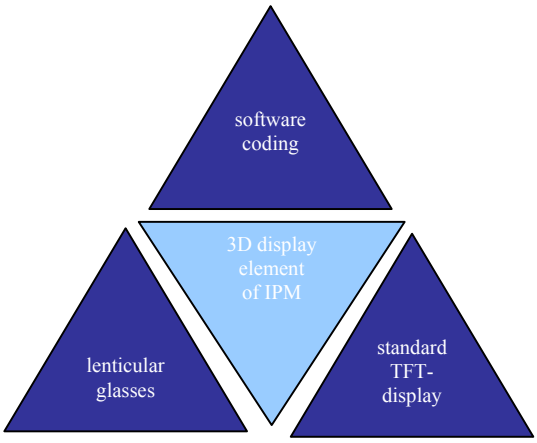
3D display technology for highest stereo resolution

UNIKASSEL VERSITÄT

3D game laptop

Short description

The Institute of Peripheral Microelectronics (IPM) of the University of Kassel is developing for several years now new ideas for a 3 dimensional digital demonstration of images and scenes.
The highest achieved resolution on laptops is presented in full color quality on the basis of an optimized 3D color coding method and an adaptive sub pixel multiplexer being accelerated by software. The 3 dimensional image quality is being doubled in comparison to other competing methods.



New scalable 3D system

The Institute of Peripheral Microeletronis developed a high resolution 3D monitor that can emit up to 64 perspectives in nearby directions with approximately 400 horizontal pixels per perspective. The horizontal resolution normally goes down by increasing numbers of perspectives performed. Therefore a scalable principle has been introduced to choose an optimal resolution for an acceptable number of perspectives. The scalability goes down to 2 perspectives for a single user 3D display.

Doubling of color quality

The 3D photo laptop shows that the subjective image quality of a right and a left image can be just as good as the original image in 2D. That means for both eyes that the perceived image quality can be doubled with the help of the optimal coding for TFT displays with adequate lenticular glasses – that gives an additional 3D win. This benefit is achieved through a new HR sub pixel coding with brightness and color filtering.

Exhibits at CeBIT 2006

3D game laptop: 17“ DELL laptop, upgraded to a 3D laptop with games. It is being activated position adaptively with the help of an infrared head tracker. Small infrared rejectors on the front of the users serve as head tracking. The present operation system is DirectX.

3D photo laptop: 15,8“ DELL Laptop presenting high resolution 3D objects in a slide show. The images show the highest auto stereoscopic 3D photo quality with a resolution up to 2x1920x1200 color pixels for both perspectives.

3D photo laptop

Calibration and compensation of color interferences

This new scalable 3D system even allows a slight aslope position of the lenticular glasses in front of the display by using a software calibration. Thereby another benefit can be achieved: minor color-Moiré-interferences can be compensated that may appear when using perpendicular lens directions.

3D technologies using high resolution stereo coding

The high resolution coding presented is a special brightness and colour filtering method developed and patented in IPM Lab which is able to compensate again the horizontal resolution loss due to the stereo multiplexing for the subjective perception. This leads to a stereoscopic win in comparison with 2 dimensional displaying.

Based on this Technology 3D laptops are exhibited. A standard laptop can be converted into a 3 D laptop with the help of low priced, special produced lenticular glasses and adequate 3D software.
The lenticular glasses are put on top of the display. One of the laptops was upgraded to a 3D photo laptop showing brilliant 3D photos with 2 perspectives; every perspective had the familiar high 3 D colour quality. The other laptop was converted into a 3D game laptop showing games in real time 3 D quality. The 3D game laptop could also be added up to a person adaptive system by putting up and connecting a standard head tracker.