

HD*live*

Voluson GE Healthcare technology

HD*live* is an extraordinary rendering method generating amazingly realistic images of the human fetus from sonographic data. Through the use of an advanced illumination model, HD*live* supports shadows, a virtual light source and advanced skin rendering techniques. This new method exploits the superb image quality provided by the latest generation of beam forming technology, speckle reduction algorithms and compound resolution imaging technologies on Voluson E8 and Voluson E8 Expert systems.

Conventional rendering methods utilize a fixed virtual light source which reflects the light off the skin surface. HD*live* differs in that it calculates the propagation of light through skin and tissue. As the light from the virtual light source enters the body, a portion of the light is reflected towards the eye while the remaining light enters the area of interest and passes through it. The light propagating through the tissue is continually scattered and attenuated. Shadows will appear where the light has travelled through denser tissue. The user may freely position a virtual light source at any angle relative to the ultrasound volume to enhance details. Positioning the virtual light source behind the scene will show the effect of translucency.

HD*live* is possible by using the second generation Dynamic Rendering Engine which performs computations in a massively parallel implementation on a dedicated graphics processing unit boasting 20 times the processing power of a desktop pc.

Bernard **BENOIT**,
hôpital Princesse Grace, Monaco

Jean-Marc **LEVAILLANT**,
hôpital du Kremlin - Bicêtre





3D Rendering of Fetal Face at 32 weeks using HDlive.



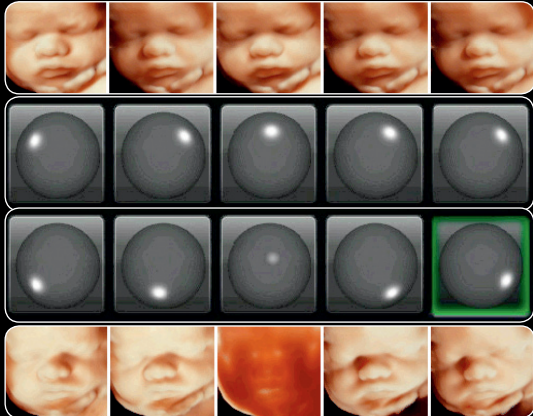
Surface Rendering using a conventional render mode. The light of the area studied comes from the front and cannot be changed.



New HDlive mode with possibility to change the virtual light source. Image on the left: Light from top left. Image on the right: Light from lower left with shadowing effect.



Embryo 8 weeks: rendering HDlive enables better segmentation of tissue structures: example of the amniotic membranes.



Different positions of the virtual light source displayed by the white dot and the result on the rendered image.



Some examples of fetuses at different stages of gestation using HDlive with different light directions.



Second trimester: Virtual light source substantially alters the terrain, drawing and the outlines of structures.



Normal surface and HDlive Rendering of a fetus with Trisomy 18: Better visualization of the insertion of the cord on the omphalocele.



acrania 11w body stalk 13w micrognathia 12w
Malformations in the first trimester. The accuracy of ultrasound in embryology is impressive.



gastroschisis 18w omphalocele 12
Other anomalies: for example, the 18weeks picture shows an important point in the analysis of intestinal loops.



Abnormalities of the fetal face with HDlive rendering. Different positions of the virtual light source highlight important clinical details.



Cleft lip: HDlive allows you to more precisely view the border between the lip and the skin.



Down Syndrome: same picture with classic rendering on the left and HDlive rendering on the right. The criterion of small mouth is well visualized on conventional surface rendering, but the inclination of the palpebral fissures is only visible on HDlive.



GE imagination at work

GE Healthcare GmbH
Beethovenstr. 239
D-42655 Solingen, Germany
T 49 212-28 02-0, F 49 212-28 02-28
www.gehealthcare.com

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