



HDRi COST Action in the NAB Show

HDRi COST Action was represented in the NAB Show this year (April 5 to 10) in Las Vegas by Prof. Alan Chalmers (University of Warwick), Jon Hatchett (University of Warwick) and Igor G. Olaizola (Vicotech).

The booth of the COST Action was located in the NAB Labs Futures Park area in the North Hall and attracted the attention of many visitors (professionals and journalists).



The University of Warwick, goHDR, Vicotech and SIM2 had the opportunity to show the outcome of their collaboration HDR activities within the context of the COST IC10005: The first end to end HDR video production pipeline in real-time. The presented set-up was composed of a capturing system based either on two Canon 5D cameras or a single Flare camera (IO Industries), connected to a merging and encoding module developed by goHDR. The encoded output was connected to the Vicotech's Tebas system able to manipulate and process the HDR video flow in real time. The processed HDR video was then displayed on a SIM2 HDR monitor.

The system shown at NAB ensures a dynamic range of over 16 f-stops along the entire pipeline and is currently been developed further by the University of Warwick and Vicotech.

Most visitors to the booth agreed on the exciting potential of the HDR video technology as the next big step in video quality improvement. The main concern regarding the adoption of HDR technology was related to interoperability issues and the lack of standards for encoding and transmission for contribution and distribution networks. IC1005 is investigating the possibility of an open standard for HDR video.

The COST Action want's to thank Peter Shirley for his invaluable support.



Real-time HDR video demo in the Future Zone section

Related links:

- <http://www.display-central.com/subscription-news/editorial-categories/technology/nab-2014-gohdr-demos-high-dynamic-range-solution/>
- <http://www.youtube.com/watch?v=XRfdMm6iwIM&feature=youtu.be>
- <http://www.youtube.com/watch?v=TXymwhHCnXc>



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SIM2 Activities on Improving its HDR Monitor

HDR47: SIM2 was the first company in the world to launch in to the display market an HDR monitor platform: the HDR47, based on a 47" Full HD LCD Panel, capable to provide more than 4000 cd/m². The SIM2 HDR monitor is available for the global research community as the display which allows the testing of the entire HDR pipe line, making it a real work and testing tool. Therefore the SIM2 HDR Monitor is particularly suitable for HDR imaging developers in the Industry, Universities, Research Centers, involved on applications as HDR Image Capture, HDR Video Compression and Decompression, Rendering, HDR Photography, etc.

An improved HDR Monitor Platform

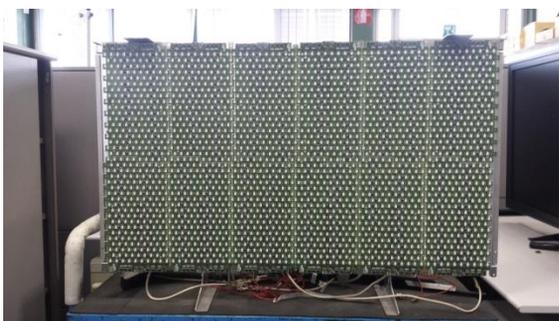
The position of Sim2 about the display is that HDR should faithfully reproduce the dynamics of brightness perceivable by human eyes without adaptation. To achieve this, the brightness must reach thousands of Nits and the modulation must be enough to avoid any solarization.

So, Sim2 in the effort to improve its HDR display intends to move in two directions: to elevate the brightness of the display up to 5000 Nit and to get whole modulation bit depth capacity of 20 bits per color. Both objectives have to be achieved with a strong reduction of the production cost.

For achieving the first of the two targets , the more difficult of the two, SIM2 is working on optimizing the power distribution and improving the LEDs emission uniformity, using innovative technologies for cost reduction.

Moreover, the production technology of LEDs enables a sensitive improvement of their efficiency, elevating the maximum brightness at the same level of power absorption.

Presently SIM2 is working on the re-design of the Back Illumination Unit (BLU) . A prototype of BLU you can see below:



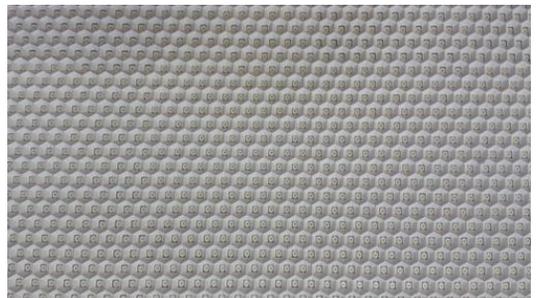
SIM2 is also improving the BLU optical performances for achieving higher local contrast with a more accurate optical design. In addition an important reduction of the assembly complexity will result in a reduction of weight and cost.

This is done through a new optical stack for optical coupling between BLU and Liquid Crystal panel (Reflector, BEF, Bulk Diffuser). A picture of the reflector structure is shown here below:



More in detail, a new reflector structure ("flowers") is under development. It has been simulated using optical CAD.

The results are in the direction of a better local contrast and a reduced optical cavity depth. A detail picture of "flower" is shown here:



Furthermore, a new heat management solution is under development, permitting a lighter, thinner, more effective , more silent and cheaper monitor mechanical structure. The aim of this improvement is to get more uniform temperature of the heat sink through a liquid-cooled plate and using new radiating elements.

An active cooling solution coming from consumer refrigerator applications represents an elegant solution for the heat spreading, distribution and dissipation, and its suitable for mass production. But forced air cooling will be necessary for blowing away the overall dissipated power.

Dr. Eng. Domenico Toffoli

Cofounder and R&D Director of SIM2

HDR Toolbox

The HDR Toolbox (https://github.com/banterle/HDR_Toolbox) is a collection of functions and scripts for reading/writing, assembling, processing, compressing and visualising HDR content, both images and videos.

The toolbox is designed to run on MATLAB and it is compatible with its open source alternative Octave.

The main purpose of this toolbox is to give access to researchers and professionals in the field to reference implementations of HDR imaging algorithms; following as close as possible the original ones as they were presented in the papers describing them.

The toolbox is distributed under the GPL version 3.

Next HDRi Workshop in Brno

The next HDRi COST Action meeting will be held in Brno from 5-11 October 2014. The week will start with a Training School (5-8 October) where leading HDR experts from the COST Action will provide courses on a range of HDR related topics. The scheduled has not been confirmed yet, but courses proposed include: HDR video tone mapping and HDR imaging with ease in C++ on Piccante.

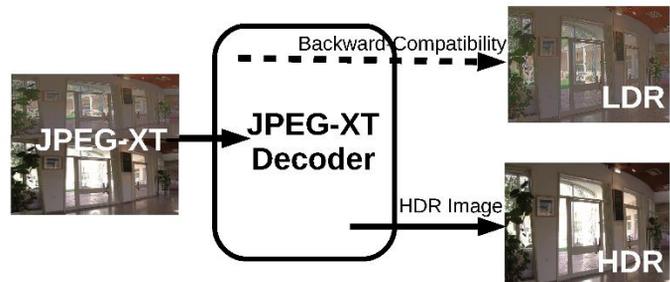
On Thursday morning 2 leading female role models will address Gender Imbalance to invited young high school and University women. The key HDRi Working Group meetings take place on Thursday and Friday (9-10 October). The HDR video compression algorithm being considered as the standard for IC1005 will be discussed in detail and methods to increase the number of early adopters of the method will be tackled. Further details will appear on IC1005's website:

<http://www.ic1005-hdri.com/>

JPEG XT coding for HDR still images

Dr. Alessandro Artusi as member of IST/37 Committee has participated to the development of the forthcoming standard ISO/IEC JPEG XT for the coding of HDR Still Images. ISO/IEC JPEG XT is a scalable and backwards compatible extension of the well-known JPEG coding system (ISO/IEC 10918-1).

The extensions address the need for coding images with higher bit-precision and coding of radiance images. ISO/IEC JPEG XT provides a flexible and extensible mechanism for representing such images, while staying backwards compatible to the set of applications based on JPEG.



Dr. Artusi has been involved in all stages for the development of ISO/IEC JPEG XT including its specifications and reference software implementation. He played an instrumental role during the JPEG XT standardization process providing technical support for integrating the XDepth technology into the standard.

As result of this, he is co-editor of the Parts 2 and 7; and he is working on the upcoming working drafts for the Parts 4 and 5.

Dr. Allessadro Artusi is the representative from Cyprus (University of Nicosia Research Foundation) of the HDRi Cost Action (ICT Action 1005).

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