NEWSLETTER of the SID-MID EUROPE CHAPTER

SID - ME

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SID-Mid Europe Chapter meeting at University of Karlsruhe, October 5-6, 1998

The afternoon meeting in Karlsruhe was devoted to **Visual Performance of Flat Panel Displays**. About 63 people were registered for the meeting. The meeting was held in the Lichttechnisches Institut-Institut für angewandte Lichttechnik. The participants were welcomed by *Prof.Dr. Kokoschka*, who gave a short introduction about the Institute. The Institute, one of the oldest in Germany and Europe, was founded in 1922, and has been working on all aspects of light, including measurements and visual perception. In course of time, also displays have become a research item in the Institute.

The first speaker was *D.Theis*, Siemens, presenting Impressions and Highlights of Asia Display 1998, which was held on September 28-October 1 in Seoul, Korea. This was the first time that the conference was held outside Japan. On September 28 a Workshop was organised with 34 invited lectures. At the conference, about 100 papers were presented, of which 20 invited. For the details of the conference we advise you to consult the Digest of Technical Papers.

Next, *M.E. Becker*, autronic-Melchers GmbH, presented a paper on LCD Visual Performance Evaluation. He distinguished between imaging of reality (video, electronic photography, medical imaging) and visualization of virtuality (word-processing, computer-aided design). In the last case, there is no existing original. The electro-optical characteristics of LCDs have different important aspects, depending on the conditions: steady state, quasi static, dynamic, directional and with regard to lateral variations. The different approaches that are used, are: one-detector viewing-cone analysis and conoscopic measurements. In conoscopic measurements, the light leaving the measuring spot of the display in is focussed so, that each angle corresponds to a pixel in a CCD camera. Results are plotted in a polar diagram. This measurement is very fast (a few seconds).

U. Kuhlmann, c't Magazin für Computertechnik, gave a presentation about the comparison of computer monitors, as performed by the Magazin. Their testing goes according a self-developed testroutine, arisen from practice. She ended with a list of recommendations, like brightness adjustable within a large range, contrast adjustment possibility in digital displays and the possibility of rotation of the display only for panels with a large viewing angle.

R. Bräuer, B. Homberg and *M. Olbrich*, Siemens, presented a paper on LCD Monitors for Industrial and Medical Applications. They compared office type and industrial type monitors. Especially the 'working days', operating hours and 'vacation' are very different. The industrial type has 365 working days and no vacation. These monitors have to be economical in the aspects of total cost of ownership, construction, installation and service, and repair. They have to be robust against vibration, temperature, electric and magnetic fields

and dust and liquids. There conclusion was, that LCDs are more economical than CRTs, although the price of an 18"-LCD monitor (DM 10.000) is much higher than that of a 21"-CRT monitor (DM 3000-6000). For medical applications, the image quality is of utmost importance. The demands are: high brightness, high resolution and high contrast. For an X-ray image an extra demand is a very good grey-level fidelity, which means: good grey-level reproduction, good grey-level stability (in time and from one picture to a following). The monitors have to comply to the German DIN standard DIN 6868-57, which applies for all medical devices. They came to the conclusion that LCDs have to be recommended for medical applications.

Next, *B. Herrmann*, Siemens, discussed the topic Human Factor Issues Concerning Flat Panels, which they study using usability engineering. In sessions with customers, working at a monitor, these customers are observed via a semi-transparant mirror, their behaviour is video-recorded and they have to answer questionnaires. As an example, it has been investigated which lighting system has to be used for flat panels. Ten systems were defined and investigated. As a result, there should be a high surrounding luminance with a low luminance on the workplace. The recommendations were to use lighting systems with indirect effect and to use wall washers for consistent lighting of ceiling and walls.

P.J. Haubner, University of Karlsruhe, presented a paper On the Visual Quality of Still Images and Low-Motion Talking-Head Digital Videos. The subject of his presentation was teleco-operation and video conferencing, in which each participant sees a 'talking head'. The data rate can be exchanged for visual quality. He defined a BCD threshold S, the Borderline between Comfort and Discomfort and an Acceptance A, the degree of satisfaction on a 7-point rating scale. From panel measurements, a number of recommendations could be deduced, regarding the window size, the number of pixels per square millimeter, the colour depth (in bit), the number of frames per second and the maximum delay between image and speech (100 ms).

G. Rankl and *G. Kugler*, Siemens, discussed the subject of TFT-LCDs Compared to CRTs in Desktop-Monitor Applications from a user point of view. They stated that, besides the price, TFT-LCDs are better than CRTs for most parameters. There are still some improvements desired, with regard to the brightness uniformity and regulation range, the electro-optical transfer characteristic, the drift of the white point with viewing angle and the pattern-dependent flicker. Brightness turns out to be very important, 200-250 cd/m^2 is sufficient. Even more important is uniformity. They recommend to change the standard LCD measurement of uniformity to the method of measuring this in a CRT, in order to be able to compete. Out of 12 purchased LCDs, only one had a 90% uniformity, according to the CRT-definition. All others were between 65 and 75%, which is not very good! The normal monitor is adjusted by the user to 70-110 cd/m^2. For workstations, the standard setting is 30-50 cd/m^2. Therefore, the degradation range from 200 to 100 cd/m^2 is sufficient, if the user has the possibility to adjust the brightness. The CRT has a maximum brightness of 100-140 cd/m^2, adjustable to <1 cd/m^2. For the colour output, the stability is important, especially in desktop publishing. They measured that the colour point of an LCD changes with the grey scale. This reduces the colour gamut of the display. In this respect, an IPS-TFT LCD turns out to be better than a TN-TFT LCD. A CRT has no reduction of the colour gamut, as the shift of the white point is small. The colour shift with viewing angle is also a weak point of the LCDs, while for CRTs this is not a problem at all. While CRTs at 80 to 100Hz frame frequency are absolutely free of flicker, LCDs have always patterns, depending on the inversion scheme used, that give a strong flicker. The conclusions were that film-compensated TFT-LCDs up to 15" are sufficient good for desktop monitors in office applications. For applications, asking for an exact representation, it is hoped that multi-domain LCDs, AM-AFLC or FEDs are the future solution.

Last speaker was *K. Wammes*, Siemens, who presented the paper Technical Aspects of Good Image Performance Under All Conditions of Ambient Light. It is difficult in cars and trains to have a good visibility of the display under all circumstances, e.g. going from the sunlight into a dark tunnel. After screening of the market, it turned out that no product was available that fulfilled the demands. Therefore, they defined an own product, having a real industrial profile, and which is made by a third party. It is readible under all conditions, gives a stable optical impression and is easy to use and has built-in robustness. They solved the problems with another colour filter technology, a brighter backlight, adjustable from <3 to 500 cd/m^2, using better match between the human receptor, the backlight spectrum and the colour filter, another cell structure to avoid image sticking and another LC. More details can be found on *http://www.i-sft.com.*

Next day, at 9 o'clock, we were received by autronic-Melchers. For this excursion 20 people had registered.

M.E. Becker welcomed us, after which *J. Kreis* of Sales and Marketing gave an introduction to the company. It was founded it 1973. In 1985, M. Becker and J. Neumeier designed the DMS-700. In 1987 the DIMOS software was developed. In 1993 a joint venture was closed with C. Melchers & Co. The products range from evaluation of visual performance (the DMS series 300, 500 and 700) via LC-cell and material evaluation (LCCS, VHRM and TBA) to modelling software (DIMOS, 2dimMOS). The competitive advantage of the company is the integration of measuring equipment and modellation software. Local support for the customers is available in Europe, Japan, Korea, Singapore, Taiwan, China and the USA. Further, autronic-Melchers contributes to committees for standardiza-

tion. DMS 703 is one of the Display Measurement Systems. It contains optics, that are a special development of the company. The positioning mechanism has a high precision of <20 µm. As the mechanism stays on room temperature, it does not have deformation. Objects to 60cm diagonal and 18cm thickness may be measured. The DMS 703 may use transmissive or diffuse reflective illumination. The ConoScope is a new instrument of autronic-Melchers. It allows for direct and real time observation of the multicoloured Fourier transform pattern, via a CCD camera, with a spot of 0.2-2 mm. After the introductory lecture, a demonstration of the various instruments and the simulation software was given. This was very impressive. For instance, in the VHRM 105 the voltage holding ratio of 8 cells can be measured simultaneously to high values. In the TBA 105 (tilt bias angle measurement) the tilt in a cell can be measured with great accuracy. The ConoScope measures contrast and colour points in a TFT-display very fast, within 5 seconds. It was a very succesful excursion and we would like to thank autronic-Melchers for the cordial reception and the nice presentations and demonstrations! Altogether, it was a very interesting and useful meeting. Thank you, Dr. Theis, for organizing this meeting!

Annual general SID-Mid Europe Chapter meeting and elections

The next SID-ME meeting is the annual general meeting and will take place March 25-26, 1999, at the Nokia Research Center in Tampere, Finland. The topic of the meeting will be **Displays for Mobile Terminals**.
In this meeting there will be elections for the Chapter Committee. The members of the Committee, whom you will find below, are willing to remain in their functions for another year. If you want to nominate other candidates, please report this to our secretary at least 7 days before the meeting. If everything is according to plan, you will have received an invitation for the meeting together with this Newsletter.

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SID payment in Euro

Starting January 1st, we would like you to pay your contribution to our ME-Chapter **in Euro**. The contribution is **60 Euro** per year (or DM 120, if you are not able at all to pay in Euro), and can be paid directly to our ME-Chapter via our treasurer:
Konto Nr. 206 020 1104
Berliner Sparkasse BLZ 100 500 00
Frank Rochow
Verwendungszweck: SID-Mid Europe,
Contribution 1999-2000.
Please take care that the year is indicated, as otherwise it is extremely difficult to separate the money from e.g. contributions for SID-MEC meetings.
Please take also care that Mr. Rochow receives the exact amount of 60 Euro and that the bank does not subtract an amount for their services! Paying in Euro will help to keep the bank fees as low as possible. Paying the SID contribution via our treasurer gives the Chapter an insight in their members, so that we can keep you informed of the European events of interest. Please notify also your colleagues, which are not yet a member of the SID, or member of another Chapter, to become a member of the SID in this way. Special attention is asked for the possibility of a **sustaining membership** for corporations, which costs $ 750,- a year, in which a maximum of 5 individual memberships are included. This sustaining membership is very favourable in connection with expositions. Details can be found in the SID Directory.

Calendar

January 26-28, 1999
Display Conference, SID-France/Le Club Visu — Grenoble, France

March 25-26, 1999
SID-MEC meeting — Nokia Research Center, Tampere, Finland

September 6-9, 1999
EuroDisplay'99 — Berlin, Germany

Sept.28-Oct.1, 1999
Display Workshop, SID-France/Le Club Visu — Grenoble, France

Final call for papers EuroDisplay'99

EuroDisplay'99 will take place from September 6 - 9 in Berlin. The deadline for submitting papers is **March 1, 1999**. Authors **must** submit a 2-5 page technical summary, including illustrations and a 35-word abstract. **Late-news papers**, containing important new results not available at the original abstract submission date, will be considered if a 100-word abstract and a 1-2 page summary with pertinent illustrations are received by **June 15, 1999**.

Abstracts and summaries should be mailed to
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If you want to place an article in the Newsletter, which is interesting for the European display society, please send it to:
K.E. Kuijk, fax: +31 40 274 33 50,
E-mail: kuijk@natlab.research.philips.com
(preferably as plain text, **not** as a Word or Wordperfect file.)
If you are a member of the SID-ME Chapter but you do not receive a copy of the Newsletter, please contact the secretary:
A. van Calster, Fax: +32 9 264 35 94,
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The Newsletter can also be found on the website of the SID under successively:
www.sid.org, *Chapters & Meetings*, *Mid-Europe*.

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