

Stereoscopic Displays and Applications XIX

Andrew J. Woods
Nicolas S. Holliman
John O. Merritt
Editors

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Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

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IS&T—The Society for Imaging Science and Technology

7003 Kilworth Lane, Springfield, Virginia, 22151 USA

Telephone +1 703 642 9090 (Eastern Time) · Fax +1 703 642 9094

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Introduction

Welcome to the proceedings of the Stereoscopic Displays and Applications XIX conference, the nineteenth annual event, held over the three day period 28–30 January 2008. The conference was part of the 2008 IS&T/SPIE Electronic Imaging: Science and Technology Symposium, held at the San Jose McEnery Convention Center, San Jose, California, USA, in January 2008. This proceedings volume contains the technical papers in support of the presentations presented at the conference.

For the last fourteen years a single proceedings volume has combined the technical papers from both the Stereoscopic Displays and Applications conference and The Engineering Reality of Virtual Reality conference. This year a separate proceedings volume is being printed for each of the conferences. As such, the name of each proceedings volume is now the same as the name of each conference – just as it was for the first four years of the Stereoscopic Displays and Applications conference.

This year's conference was the best attended in the entire history of this conference. It featured a broad range of topics, presentations, and events. This introduction provides an overview of the conference: a reminder for those who attended, and an insight into what happened for those that weren't able to attend.

The **first day** of the SD&A conference hosted four technical sessions: Stereoscopic Image Quality and Image Processing (chaired by Nick Holliman), Volumetric Displays (chaired by Gregg Favalora), Stereoscopic Human Factors (chaired by John Merritt), and Multiview 3D Content (chaired by Neil Dodgson). The technical sessions form the backbone of the conference, and their content is detailed in the papers contained in this volume.

The final formal session of the first day was the two-hour 3D Theatre Session, chaired by Andrew Woods and Chris Ward. The purpose of this regular event is to showcase how 3D video is being used and produced around the world – in application areas including industrial, medical, and entertainment. This year, we screened the following 3D content (or segments thereof) on the conference's two high-quality circularly polarized stereoscopic rear-projection systems:

- "Family Guy - Tie-Fighter vs. Millennium Falcon" by 20th Century Fox (USA)
- "Before and After" by Jim Long (USA)
- "Granny" by University of Cambridge (UK) and Pictures on the Wall (UK)
- "Bungee Fishing" by Michal Husak, Gali-3D and Bronislav Vavrinka, Secondary School of Applied Cybernetics (Czech Republic)

- “Chain vs. Rock” by Curtin University (Australia) and Welaptega Marine (Canada)
- “Moving Still” by Santiago Caicedo (France)
- “Seeing the Sun in 3D” by NASA’s STEREO Mission (USA), Editing: WASP (Australia)
- “The Complete Perseus” by The Visualization Laboratory, Durham University (UK) and The Initiative in Innovative Computing, Harvard University (USA)
- “da Vinci 3D HD surgical endoscope clips” by Lightspeed Design Group (USA) and Intuitive Surgical (USA)
- “Strabismus - Corrective Eye Surgery” by Tree-D films (USA) and TrueVision Systems (USA)
- “Visualizing and Recording Stereoscopic Medical Operations in Real-Time” by ANDXOR Corporation (USA)
- “Dive!” by Lightspeed Design Group (USA)
- “Stereoscopic projection: adding value to 4D computational geoscience” by CSIRO (Australia)
- “Woods of the Heart” by NHK Technical Service (Japan)
- “Slow Glass” by Stereo Club of Southern California (USA)
- “The Towers of Simon Rodia” and “The Ennis House” by Thomas R. Koester (USA)
- “The Little Match Girl” and other sport and concert 3D footage by Stereopia (South Korea)
- “3D Sun” by K2 Communications (USA)
- “Philips WOWvx 3D technology demo” by Philips (Netherlands)
- “TRIAL” by Stereoscape (Finland)
- “The Time of Illusion” (BEST OF SHOW live action – SD&A 2007) by NHK Technical Service (Japan)
- “FIFA World Cup Trophy Tour” (BEST OF SHOW CGI – SD&A 2007) by Haptics (South Africa) and Crew 972 (Israel)
- “Dzignlight 3D demo reel” by Dzignlight Studios (USA)
- “3D Skydiving” by Dzignlight Studios (USA)
- “Fly Me to the Moon” by nWave Pictures (Belgium)
- “Majestic Lion” by nWave Pictures (Belgium)
- “African Elephant and White Rhino” by nWave Pictures (Belgium)
- “Bugs” by SK Films (Canada)
- “21st Century 3D demo reel” by 21st Century 3D (USA)
- “HUMIRA Freedom” by 21st Century 3D (USA)
- “Super Sonogong” Digital Magic Entertainment (South Korea)
- “Wacky Wolf” by Digital Magic Entertainment Ltd (South Korea)
- “Night of the Living Dead 3D” by Lux Digital Pictures (USA)
- “Beowulf 3D” (excerpts) by Sony Pictures Imageworks (USA)

The source resolution of the material ranged from field-sequential PAL (720×576) right up to dual-channel stereoscopic full-HD (1920×1080). The two-hour session was particularly popular, with over 250 attendees filling the room.

In recognition of the high quality of material shown at the 3D Theatre, this year we again offered two Best of Show prizes. Our judges were Dr. Samuel Zhou, Director of Image Technology at IMAX Corporation (Canada) and Enrique Criado from Enxebre Entertainment (Spain), who chose the following winners:

- Best of Show (Computer Graphics): "Super Sonogong" by Digital Magic Entertainment (South Korea)
- Best of Show (Live Action): "3D Skydiving" by Eric Deren, Dzignlight Studios (USA).

Congratulations to our winners on their beautiful work.

An illustrated listing of the content shown during the 3D Theatre session will be available from the conference website: www.stereoscopic.org/3dcinema

The evening concluded with the traditional, enjoyable meal at the BoTown Chinese Restaurant in downtown San Jose. It was a good chance for over 80 conference attendees to mingle and talk in a relaxed atmosphere.

The **second day** of the SD&A conference included two double technical sessions – one on autostereoscopic displays, an area that has been of considerable interest over the years at the conference, and one on entertainment, an area that is receiving rapidly growing interest in the last few years. The technical sessions were: Autostereoscopic Displays I (chaired by Vivian Walworth), Autostereoscopic Displays II (chaired by Neil Dodgson), Digital 3D Stereoscopic Entertainment I (chaired by Andrew Woods), and Digital 3D Stereoscopic Entertainment II (chaired by Chris Ward). The full papers from these technical sessions are contained in this volume.

An informal lunch-time round-table discussion was chaired on this day by Bernard Mendiburu on the topic, "Stereoscopic tools for 3-D movie making: a look into the future." This facilitated a useful discussion between 3D movie makers and 3D researchers regarding future stereoscopic movie-making tools.

The final event of the day was the ever-popular **Demonstration Session**, which has now run continuously for over 10 years. This year it was, for the third time, held as a symposium-wide event, open to demonstrators from all 20 conferences. It was again pleasing to see such a wide variety of stereoscopic imaging systems on display and to see an even larger audience actively engaging with the various displays. The session was open for a full three hours, and the stereoscopic demonstrators were kept busy for that entire time and more.

This year the following items were on display at the demonstration session:

- Brad Nelson and David Mark from **Kerner Optical Research and Development** (KORD) (San Rafael, California) demonstrated the new SpectronIQ 46" 3D Full-HD (1920×1080) LCD HDTV (Model number IQ3D-A46), which was viewed using circularly polarized 3D glasses. 3D content shown on the display included the 3D trailer for the upcoming 3D movie, "Journey to the Center of the Earth 3D."
- Chris Ward and Bob Mueller from **Lightspeed Design** (Bellevue, Washington) demonstrated a custom version of DepthQ Capture software for the analysis, optimization and correction of 3D HD video content from stereoscopic camera rigs. Hardware used included a DepthQ 3D projector, rear-projection screen, an eyeball-like stereoscopic camera pair, and NuVision cinema LCS (Liquid Crystal Shutter) 3D glasses.
- Ethan Schur from **TDVision Systems** (Naperville, Illinois) demonstrated the TDVisor, a stereoscopic head-mounted display (HMD) with 800×600 resolution. Content shown on the display included a navigable stereoscopic virtual world and portals to show a selection of stereoscopic videos. A 2D projector was setup to allow the attendees to see what the person wearing the TDVisor could see.
- Scott Robinson from **Planar Systems** (Beaverton, Oregon) demonstrated the SD2420W StereoMirror display, which has 1920×1200 stereoscopic resolution with a 24" diagonal screen size and is viewed with passive polarized 3D glasses.
- Walter Funk from **Hologlyphics** (Oakland, California) demonstrated a small true 3D display showing stereoscopic animations in synchronization with live performed music.
- Atsushi Miyazawa and Motonaga Ishii from **Namco Bandai Games** (Tokyo, Japan) demonstrated a special 3D display non-production version of SOULCALIBUR IV on the Xbox 360 game platform connected to a multiview autostereoscopic display.
- Neil Schneider from **Meant to be Seen** (Toronto, Canada) demonstrated several production games running in stereoscopic mode using the iZ3D stereoscopic game driver and shown on a 22" iZ3D stereoscopic monitor. The monitor was viewed using passive polarized 3D glasses and had a stereoscopic resolution of 1680×1050 per eye.
- Jinwoong Kim and staff from **Electronics and Telecommunications Research Institute** (ETRI) (Daejeon, South Korea) demonstrated a complete 3D DMB (digital multimedia broadcast) system for wide-area broadcast of stereoscopic content to handheld consumer devices with an in-built two-view autostereoscopic display. The system components on show included a stereoscopic 3D video transmitter and a selection of UMPC (ultra-mobile personal computer) mobile devices – all capable of receiving and displaying 3D DMB.

- Shin-ichi Uehara from **NEC LCD Technologies** (Kanagawa, Japan) demonstrated a 1-inch diagonal Transflective 2D and 3D LCD with HDDP (horizontally double-density pixels) arrangement intended for use on 3D mobile phones. In 3D mode the display was two-view autostereoscopic.
- Robert-Paul Berretty and Bart Barenbrug from **Philips 3D Solutions** (Eindhoven, Netherlands) demonstrated the 42" WOW multiview autostereoscopic display (model number: 42-3D6W02). 3D content shown on the display included the WOWvx demo shown the previous night in the 3D Theatre session, but in multiview 3D on this display. The display has a base resolution of 1920×1080 and outputs nine views.
- Nobuaki Abe from **Waseda University** (Tokyo, Japan) demonstrated an interactive stereoscopic viewer system for cultural heritage. The system consisted of a 3D display using micro-polarizer, a touch-panel, and a tilt encoder and was controlled by a Windows PC with special software.
- Shinsuke Kishi from **Waseda University** (Tokyo, Japan) demonstrated prototype software to correct the parallax of stereoscopic image and video content to provide improved viewing safety and comfort. The software was shown on a 24" Hyundai 3D LCD monitor viewed using circularly polarized 3D glasses.
- Satoshi Maekawa from **National Institute of Information & Communications Technology** (NICT) (Kyoto, Japan) demonstrated several new imaging optics using an array of micro-mirrors.
- Paul Gorley and Nick Holliman from the **University of Durham** (Durham, United Kingdom) demonstrated a human visual system based, stereoscopic image quality metric for compression of stereoscopic images. Sample images were shown on a Sharp RD-3D autostereoscopic laptop.
- **REAL D** (Beverly Hills, California) had a table loaded with give-away "REAL D - The Premier Digital 3D Experience" stickers.
- Massimo Sabbatini from the **European Space Agency** (Noordwijk, Netherlands) and Max Collon and Marco Beijersbergen from **Cosine Research** (Leiden, Netherlands) demonstrated the ERB2 (Erasmus Recording Binocular) digital stereoscopic camcorder with 720P resolution, in-built hard drive and stereoscopic view-finder. Live and pre-recorded video output from the camera was shown on a Miracube 24" 3D LCD – a micropolarizer-based stereoscopic display with 1920×1200 resolution, viewed with passive polarized 3D glasses.
- Hideki Kakeya from the **University of Tsukuba** (Tsukuba, Japan) demonstrated a coarse integral imaging autostereoscopic display, which, according to the accompanying paper, enables natural focal accommodation of the viewer.
- John Rupkalvis from **Stereoscope International** (Burbank, California) demonstrated a special lateral-shift stereoscopic video camera, a small passive polarized stereoscopic monitor, and a special parallax-indicating light.
- Chaio Wang from the **University of Southern California** (Los Angeles, California) demonstrated software for the interactive adjustment and manipulation of stereoscopic disparity in an image, using desktop and laptop PCs including a Sharp AL-3D autostereoscopic laptop.

- Alexander Sawchuk from the **University of Southern California** (Los Angeles) demonstrated a 3D interactive navigation device and a set of computer games to measure visual and motor characteristics of human subjects.
- Ianir Ideses from **Tel-Aviv University** (Tel-Aviv, Israel) demonstrated 3D images and spatially produced depth maps using 3D visualization devices.
- Kazuhisa Yanaka from **Kanagawa Institute of Technology** (Kanagawa, Japan) demonstrated how full parallax is obtained by piling up one of two kinds of hexagonal fly's eye lens sheets on an LCD monitor of a PC.
- John Dammann from the **Army Research Laboratory** (Adelphi, Maryland) demonstrated a stereoscopic visualization of electrostatic charges moving around a helicopter in flight on a Sharp RD3D autostereoscopic laptop. The motion of the blades causes the flow of charges, and the interactive visualization allows the user to zoom, pan and control the blade motion.

In addition, stereoscopic products were also on display in the exhibit area on Tuesday and Wednesday:

- Wayne Bickley and Doug Boyer from **Christie Digital** (Cypress, California) demonstrated the "HD Mobility" – a full high-definition 80" rear-projection stereoscopic display based on the use of a Mirage HD3 Active Stereoscopic three-chip DLP Projector with 2,800 ANSI Lumens. The display was viewed using the new NuVision Cinema LCS 3D glasses, and 3D content shown on the display included 3D stills and interactive stereoscopic models of protein molecules, using a molecular modeling program called VMD from the University of Illinois.
- The **3D Consortium** (Japan) facilitated the exhibition of stereoscopic products from several 3D Consortium member companies:
 - Atsushi Miyazawa and Motonaga Ishii from **Namco Bandai Games** (Tokyo, Japan) demonstrated a stereoscopic version of Ridge Racer 7 running on a PlayStation 3 and viewed with circularly polarized 3D glasses. The game was displayed on a 46-inch Sony Bravia HDTV equipped with a micro-polarizer filter technology from Arisawa (Japan) with the cooperation of NHK Technical Services (Japan).
 - David Mark from **Mark Resources** (San Francisco, California) demonstrated a 60" diagonal full-color autostereoscopic 3D backlit transparency print of fluorescent minerals.
 - Shaun Cotter from **Seeing Machines** (Canberra, Australia) demonstrated "faceAPI" software for automatic head and face tracking and measurement.
- David Pepy and Philippe Roche from **Alioscopy USA** (San Diego, California) demonstrated the 40" Alioscopy autostereoscopic 3D display which provided 8 views and is based on a full-HD LCD HDTV. 3D content shown included 3D CGI and 3D live-action footage. Also displayed were some 3D Alioscopy posters giving examples of client work.

Also in the exhibit area, the annual **Phantogram Exhibit** was organized by Terry Wilson from Terryfic3D. As well as showing a vast collection of Terry's own 3D phantograms, the exhibit included works from the following phantogram artists: Sam Paechter (UK), Takashi Sekitani (Japan), and Barry Rothstein (USA).

An extensive photo montage and listing of the demonstration session and exhibits will be placed on the conference website over the next few months: www.stereoscopic.org

In parallel with the demonstration session, the 16 SD&A conference poster authors presented their posters in the symposium-wide poster session. The full papers from the poster session are also contained in this volume.

The **third day** of the SD&A conference included three technical sessions: Medical Applications of Stereoscopy (chaired by Mike Weissman), Stereoscopic Display Applications (chaired by Neil Dodgson), and Integral 3D Displays (chaired by Nick Holliman). The papers from these technical sessions are contained in the SD&A proceedings volume.

The special events on this third and final day of the SD&A conference were the discussion forum and the keynote presentation.

This year's **Discussion Forum** was titled, "What's so great about stereoscopic displays, anyway?" The aim of this year's topic was to explore the wow factor of stereoscopic displays and the aspects that are driving their growing usage.

The forum was chaired by Lenny Lipton, CTO of REAL D, and we were privileged to have the following panelists: Susan R. Barry, Professor of Cell Biology, Mount Holyoke College ("Stereo Sue" from the Oliver Sacks article in *The New Yorker* magazine); Christopher W. Tyler, Smith-Kettlewell Eye Research Institute (Inventor of the Autostereogram – Single Image Random Dot Stereogram); Bernice E. Rogowitz, IBM Corp. (Cochair of the Human Vision and Electronic Imaging conference); and Chris Chinnock, Insight Media (editor of *Display Daily* and *Large Display Report*).

Sue Barry kicked off the discussion with a vivid description of her experience of seeing stereoscopically for the first time at the age of 48. She also revealed that she is writing a book on her experiences and has interviewed eleven other people who, like herself, had gained stereoscopic vision in later life after undergoing visual training. The other panelists and audience members also contributed to the lively discussion, and the session could have lasted much longer than the one hour allocated.

This year's **Keynote Presentation**, "Stereoscopic and volumetric 3D displays based on DLP® technology," was presented by Dr. Larry J. Hornbeck from Texas

Instruments. Dr. Hornbeck invented the DMD (Digital Micromirror Device) used in all DLP front projectors and DLP rear-projection displays.

Texas Instruments' DLP technology enables both stereoscopic and volumetric 3-D imaging for a variety of markets, including entertainment, medical imaging and scientific visualization. For the first time in history, stereoscopic 3-D entertainment is commercially viable and is being implemented on a large scale. DLP Cinema® projectors, equipped with enhanced stereoscopic functions, support a variety of 3-D digital cinema implementations. Today, approximately 20 percent of the more than 5,000 DLP Cinema systems currently installed take advantage of this 3-D functionality. In the consumer HDTV market, DLP technology now enables 3-D display modes in DLP HDTVs, with more than 16 models entering the market in 2007. Innovators in the display industry are using DLP technology to advance displays from 2-D image planes to 3-D volumetric space. Interactive, volumetric DLP displays provide real-time 3-D information needed to perform complicated tasks, such as targeting cancer tumors in medical radiation therapy. This informative talk is designed to further the understanding of the role of DLP technology in the 3-D world. Topics include an introduction to DLP technology; the status of DLP technology in the 3-D home entertainment and theatrical markets; the primary attributes of DLP technology that uniquely enable single-projector solutions for stereoscopic 3-D entertainment and volumetric imaging applications; how systems designers are leveraging these attributes to optimize for key application-specific requirements; and some thoughts on the future of stereoscopic 3-D entertainment.

Dr. Hornbeck's presentation was informative and entertaining and was a highlight for many attendees.

Several sessions at this year's SD&A conference were video recorded – the keynote presentation, the discussion forum, and all 12 papers in the double technical session, "Digital 3D Stereoscopic Entertainment." The process of editing all of the content has already started and the plan is to make the content available sometime through this year via the conference website www.stereoscopic.org

Many individuals and companies contributed in various ways to make this year's SD&A conference very successful:

- This year's conference was formally sponsored by **IMAX Corporation** (Mississauga, Canada) and **REAL D** (Beverly Hills, California). Conference sponsorship is a valuable way for companies to support the running of the conference and to gain marketing exposure. Both of these companies are at the forefront of stereoscopic developments, and we thank them for their support.

- We also appreciate the support of this year's stereoscopic projection sponsors: **Christie Digital** (Cypress, California), **JVC Professional** (Cypress, California), **DepthQ Stereoscopic** (Bellevue, Washington), and **Kerner Optical Research and Development** (San Rafael, California).

The ability to present high-quality large-screen stereoscopic images and video at the conference is vital to the conference's success. This year's setup was again a feast for the eyes.

The two stereoscopic projection systems set up in the SD&A conference room were: a Christie Digital "S+4K" projector (1400×1050 resolution, 3 chip DLP) projecting onto a 8×6 foot rear-screen outputting frame-sequential circularly polarized 3D (at up to 120Hz) by way of an active polarization modulator, and a stereo-pair of JVC "DLA-RS1" projectors (1920×1080 resolution, 3 chip LCoS) projecting onto a 8×4.5 foot rear-screen. Both projection systems output circularly polarized full-color 3D images and video, and members of the audience were provided with circularly polarized 3D glasses. DepthQ Stereoscopic provided a pair of DepthQ stereoscopic media servers (one for each stereoscopic projection system) for playback of all of the stereoscopic video content shown during the 3D Theatre and also many other times during the conference. Kerner Optical R&D provided the 8×4.5 foot rear-projection screen, stereoscopic projector stacker, 3D demultiplexer, 3D Scan Doubler, and DVD player. Particular thanks go to: Wayne Bickley and Doug Boyer from Christie Digital, Rod Sterling and Rob Buddle from JVC; Chris Ward, Bob Mueller, and Dan Lawrence from DepthQ Stereoscopic, and Brad Nelson and David Mark from Kerner Optical.

- We thank our media sponsors: Veritas et Visus, Stereo World magazine, 3D BizEx, and Meant to be Seen 3D.
- We very much appreciate the dedicated support of Stephan Keith (SRK Graphics Research), who helped meet the AV needs of all of our presenters.
- We are grateful to all of the providers of 3D content for the 3D Theatre session for allowing their content to be shown to the conference audience.
- The conference committee plays an important role throughout the year, ensuring the correct technical direction of the meeting. Sincere thanks go to Neil Dodgson, Gregg Favallora, Janusz Konrad, Shojiro Nagata, Steven L Smith, Vivian Walworth, and Michael Weissman. We also wish to welcome incoming committee members Chris Ward and Takashi Kawai, and we thank Steven Smith, who is leaving the committee, for his past efforts.
- Thanks to the demonstration session presenters for bringing equipment to show. Some equipment traveled from overseas, making the contribution to the meeting particularly worthy of praise.
- Thanks to the following reviewers who helped the conference committee peer review selected technical papers: Ian J. Grimstead, Cardiff University (UK) and Geng Sun, Durham University (UK).
- Thanks also to the staff at IS&T and SPIE, who were instrumental in helping to organize the meeting.
- Most importantly, we thank the conference authors and attendees, who ultimately made this meeting such a successful event.

Two prizes were offered at the conference for the best use of the stereoscopic projection tools during the technical presentations. Many presentations used stereoscopic projection as an integral part of their presentations (this was a stereoscopic conference after all) and the two winners chosen by the SD&A conference chairs were:

- Rob Engle from Sony Pictures Imageworks (USA) for his paper, "Beowulf 3D: a case study." Rob's presentation included several stereoscopic stills from the Beowulf movie animated to illustrate the effect of changes to various stereoscopic camera parameters.
- Enrique Criado from Enxebre Entertainment (Spain) for his paper "Original and creative stereoscopic film making." Enrique's presentation included many stereoscopic backgrounds for his presentation slides and also an amusing stereoscopic video sequence at the end of his presentation.

Two further prizes were offered for individuals who placed the SD&A conference banner on their website during the year to help promote the conference. The two winners were Todd Martin from 3dcgi.com and Jim Dorey from Marketsaw. We will be running the SD&A conference banner promotion again for the 2009 conference – please consider placing the SD&A banner on your website.

The Stereoscopic Displays and Applications conference is truly an international meeting with wide representation from around the world. A quick analysis of the oral papers presented at this year's conference reveals that approximately a third of the papers came from the Americas, approximately a third came from the Asia-Pacific, and approximately a third came from Europe (thanks to Bernard Mendiburu for bringing this to our attention). We were asked if this distribution was intentional – the committee can confirm that country of origin does not play any part in the review of abstracts. This distribution merely reflects a strong interest worldwide in stereoscopic imaging research and development.

This year for the first time the conference committee instituted a process of peer review on selected papers in the proceedings. This process was initiated to facilitate the improved quality of the proceedings, provide authors with constructive feedback on their submissions, and also provide academic authors with additional recognition for their publications. There is an increasing importance of peer reviewed publications in academic circles worldwide and the SD&A conference wishes to remain the most relevant place for stereoscopic imaging papers to be published. This year, two reviewers were sought for each paper for which peer review was requested. A single-blind review process was conducted for those papers, and authors were given a two-week window to respond to the reviewer comments. The chairs reviewed the author responses to the reviews and decided whether the responses to the reviewer comments justified the paper being classified a peer reviewed technical paper. This year the peer reviewed papers were:

- [6803-04] "Methods for improving the quality of user-created stereoscopic content," Lachlan D. Pockett, Sr., Marja Salmimaa, Nokia Research Ctr. (Finland)
- [6803-31] "The compatibility of consumer plasma displays with time-sequential stereoscopic 3D visualization," Andrew J. Woods, Kai S. Karvinen, Curtin Univ. of Technology (Australia)
- [6803-35] "A composition tool for creating comfortable stereoscopic images," Katharina Quintus, Michael W. Halle, Brigham and Women's Hospital
- [6803-36] "Radiation therapy planning using a volumetric 3D display: PerspectaRAD," Joshua Napoli, Sandy Stutsman, Actuality Medical, Inc.; James C. H. Chu, Xing Gong, Rush Univ. Medical Ctr.; Mark J. Rivard, Tufts-New England Medical Ctr.; Gene Cardarelli, Rhode Island Hospital; Thomas P. Ryan, Gregg E. Favolora, Actuality Medical, Inc.

Conference activities do not stop at the end of the January meeting. The SD&A conference website provides a focus for conference activities during the time between conferences. We will be seeking abstracts for the 2009 conference in April through June. You can join the conference mailing list to receive conference announcements — just visit the SD&A conference website for details. The SD&A conference website provides a focal point for many activities and provides a timetable for important meeting deadlines. It has an extensive collection of photographs highlighting the activities of past conferences. In addition the website hosts the stereoscopic virtual library, which contains several historically important books that have been digitized, in full, into PDF format, and are available for free download. Visit the website to gain an understanding of the past, present, and future of stereoscopic imaging and, most of all, think now about presenting a paper or attending next year's conference. The Stereoscopic Displays and Applications conference website is located at: www.stereoscopic.org

Next year is the 20th anniversary of the Stereoscopic Displays and Applications conference and we are planning several events to mark this special occasion. The first Stereoscopic Displays and Applications conference was held in 1990 in Santa Clara, California and chaired by Scott Fisher and John Merritt. The conference has been held in Silicon Valley for its entire history, either in San Jose or Santa Clara. Many people have attended the conference a surprisingly high number of times, meaning that there are many familiar faces in the audience every year. There also seems to be a competition brewing between Lenny Lipton and John Merritt as to who has attended the most.

The 20th anniversary conference will be held for three days in the period 18-22 January 2009, at the San Jose McEnery Convention Center, San Jose, California, as part of the 2009 IS&T/SPIE Electronic Imaging: Science & Technology Symposium. The Photonics West symposium will be held the week after, also at the San Jose Convention Center. The 2009 conference promises to continue a tradition of presenting and demonstrating the latest technologies relevant to

stereoscopic displays and applications. Please consider attending, presenting, or demonstrating at the 2009 Stereoscopic Displays and Applications conference. We hope to see you there!

Andrew J. Woods
Nicolas S. Holliman
John O. Merritt

Stereoscopic Displays and Applications XIX (2008)
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The logo for Christie features a stylized blue triangle above the word "CHRISTIE" in a bold, blue, italicized sans-serif font.

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The logo for DepthQ is contained within a dark grey rounded rectangle with a purple border. It features the text "DepthQ[®]" in white, with "STEREOSCOPIC" in smaller white capital letters below it.

The logo for Kerner Optical consists of a stylized lowercase "b" formed by two overlapping shapes, one black and one blue, followed by the text "KERNER OPTICAL" in a black sans-serif font.

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