3D Stereo MEDIA
Call for Posters

3D Stereo MEDIA addresses the complete chain of methods and technologies from the capture and generation of 3D contents, through its processing and transmission, to the ultimate 3D viewing and/or immersion. While the tip of the iceberg is 3D stereo, the event also covers the more advanced techniques that go beyond 3D stereo and that attempt to provide a perception that is as close as possible to "true 3D", such as integral imaging, multi-view imaging, and free-viewpoint TV. 3D Stereo MEDIA also addresses all the applications of the above methods and technologies, such as 3D digital cinema, 3D stereo visualization of volumetric medical images, and advertising via lenticular sheets.

Proposal for scientific/technical posters are thus solicited in the domains listed below, as well as in other related domains falling within the scope of the event.

Stereoscopy and 3D perception

- Principles of stereoscopy, binocular vision, trinocular vision, ...
- Physiology, biology, and evolution in humans and animals.
- Psychophysics, perception, and cognition in humans. Models of human visual system (HVS), with emphasis on 3D perception. 3D optical illusions. Effects of gender and age. Required number of frames per second.
- Influence of 3D perception on task performance. Task-performance testing. Immersion in synthetic 3D.
- Sources of, and remedies against, visual fatigue and visual discomfort in stereoscopic "displays". Ghosting, cross-talk. Color mismatch. ...
- 3D-stereo-induced motion sickness and disorientation, including in particular applications, such as helicopter flying.
- Stereography: The art of 3D. Language and rules of 3D. Hyper stereo. Case of 3D movies. Shooting with multiple inter-oculars.
- Quantifying the quality of 3D.
- Incrustation of subtitles, text, and graphics (at the appropriate depths).
- Other human factors, including for more advanced means of near-true-3D visualization (listed elsewhere).

Basic means of capture and production of 3D contents

- Case of two real (stereo) views. Stereoscopic cameras (3D rigs). Types, technologies, and products. Mirror-based; side-by-side. IMAX. Issues: shooting from moving, vibrating platforms (e.g. helicopters), under water, in space, ...
- Case of multiple real views. Multi-camera rigs. Issues. (Also see advanced techniques elsewhere.)
- Stereo and multi-view with 3D computer graphics (CG). State-of-the-art techniques for scientists, engineers, and movie makers. Special case of movies: 3D computer graphics imagery (3D CGI). Tools: 3ds Max, Blender, LightWave 3D, Maya, Autodesk Softimage...
- Motion capture: techniques (sensor- and image-based), equipments, and uses.
- 2D to 3D conversion (aka "dimensionalization"), especially for movies.
- Monitoring and/or correction of 3D, color balance... On-site and real-time for live capture. Off-site during post-production.

Basic means of visualization of 3D contents (basic "3D displays")

- Basic and advanced anaglyphic systems.
- Stereoscopic displays, projectors, and screens (glass-based). Passive glasses (polarization-based, light-wavelength-based). Active glasses.
- Auto-stereoscopic (non-glass-based, with two views).
- Multi-view displays aks auto-multiscopic displays (non-glass-based, with multiple views). Passive. Active, i.e. with tracking of viewer(s).
- Stereoscopic head-mounted displays (3D HMDs). Applications.
- Special projection systems: IMAX, attraction parks, curved screens...
- Small auto-stereoscopic displays for phones and mobile devices.
- Artifacts (ghosting, cross-talk...). Sources and corrections.
- Quality measures for 3D visualization systems, in particular for auto-stereoscopic displays.
- Display technologies for 3D visualization, with pros and cons: DLP, PFP, micro-pol LCD, page-flipping LCD... Display speed (frames per second).
- Auto-stereoscopic display table. Auto-stereoscopic billboards and signage.
- Visualization of 3D volume images on above displays, e.g. tomographic CT and MRI medical images.
- Visualization "caves".

Transmission of 3D contents

- Encoding and transmission of 3D content for cinema and home. Compression, encryption, formats, standards, and practices.
- Compression of 3D content for transmission to 3D phones and mobile devices. Effect on 3D perception.
- Live 3D broadcast. On-site, real-time monitoring and correction of 3D, color balance... (also listed elsewhere). Technology for transmission over dedicated links (fiber, satellite...). Technology for transmission over internet (3D over IP). Real-time incrustation of subtitles, text, and graphics. 3D slow-motion. Other real-time processing. Applications (concerts, sports...).

Advanced means of capture and visualization of 3D contents

- Integral imaging (II) aka lightfield imaging: The grail in 3D imaging and visualization. Integral photography and integral video. Synthetic aperture II (SAII). Under-water II.
- Holography. Holograms. Digital holography. Electro-holography. Holographic photography. Holographic video. Holographic displays.
- Multiview imaging (MVI) and free-viewpoint TV (FTV).
- Volumetric displays.
- Omnidirectional imaging.
- Non-flat displays (curved, cylinder...).
- 3D imaging at non-visible wavelengths (IR, UV, MMW...).
- Lenticular displays. Technology and uses. Lenticular photography. Lenticular advertising.
- Range-imaging sensors producing depth (or range) maps (or images). "3D cameras" for shorter ranges. 3D imaging laser radars for longer ranges. Recording of range only, range plus intensity, range plus color.

Image processing, image analysis and computer vision: Theory, methods, and algorithms

- 2D to 3D conversion ("dimensionalization"). Simple techniques for consumer products (e.g. auto-stereoscopic picture frames). Advanced techniques for movies.
- (Re)construction of depth maps (aka range images) from data other than from range-imaging sensors. "Depth-from-stereo": Reconstruction from a pair of stereo images. "Depth-from-motion": Reconstruction from a video sequence. "Depth-from-X": Reconstruction from x. Reconstruction of a 3D scene from a video sequence. Use of multiple views recorded by unknown cameras, such as photos/videos posted on internet.
- Preprocessing of depth maps obtained from range-imaging sensors. Detection and replacement of missing values and outliers.
- Use of depth maps. Segmentation of depth maps. Joint segmentation of video and range images. Occlusion handling. Layered-depth ordering (LDO), layered-depth imaging (LDI), layered-depth video (LDV). Registration with video and other imaging modalities (IR, radar...). Interpolation between views, multi-viewpoint image generation. Applications to auto-stereoscopic and auto-multiscopic displays. Depth-image-based rendering (DIBR). Surrogate depth maps.
- Motion capture and transfer. Sensor-based and image-based. (Also listed elsewhere.)
- Creation and animation of 3D models (objects and avatars). Extraction of 3D objects/persons. Surface and volume meshing. Use of finite-element method (FEM) to give real-life behaviors to objects. Real-time animation and stereo projection of 3D avatars.
- Compression, coding, encryption. Coding of depth maps. Image plus depth (2D + Z). JPEG2000, MPEG... Multi-view coding (MVC). 3D watermarking. Compression for phones and mobile devices.
- Combining synthetic and real images. Insertion of synthetic objects in real images, with or without knowledge of depth. "Match moving". Conversely, insertion of objects extracted from live video (2D, 3D, multi-view) in synthetic environments. Applications to virtual studios (2D, stereoscopic 3D, or multi-view).
- Monitoring and/or correction of 3D, color balance... for movies .On-site and real-time for live capture. Off-site during post-production. (Also listed elsewhere.)
- Joint use of 3D shooting, 3D CGI, dimentionalized 2D, 2D... in movie making.
- Algorithms and tools for post-production of 3D movies. Production workflows.
- Extraction and use of metadata. Archiving and data mining for 3D contents.
- GPU- and GPGPU-based implementations.

3D sound and audio

- Spatialization of sound and audio. With loudspeakers. With headsets.
- Joint use of 3D audio and 3D visualization.
- Applications. Immersive environments. Architecture. 3D movies.
- Theory, methods, algorithms, and uses.

Immersive environments

- Virtual reality. Augmented reality.
- Interaction with 3D objects. Navigation in 3D environments.
- 3D tele-immersion and remote collaboration.
- Glass-based and non-glass-based (auto-stereoscopic) environments.
- 3D caves (covered elsewhere).
- 3D games.
- Museography and visualization of cultural heritage.
- Advertising, communication, and signage.

Applications of 3D imaging in science and engineering

- Scientific and technical visualization (in general).
- Architecture and urban planning.
- Design (artistic, mechanical, aerospace...).
- Simulation (mechanical, electrical, electromagnetic, multi-physical...).
- Cartography and geomatics.
- Simulators (vehicles, defense, surgery, training...).
- Tele-operation and tele-robotics.
- Space.
- Remote sensing.
- Security and defense.
- Exotic imaging modalities: Radar, IR, UV, passive MMW.
- Medical imaging and life sciences.
- Microscopy.
- Molecular modeling.
- Non-destructive testing.
- Metrology.
- Archeometry and archeology.

Detailed information concerning the submission of poster proposals can be found on www.3dmedia2010.com