

Inter BEE 2009

International Broadcast Equipment Exhibition

C O N T E N T F O R U M

Visual Symposium

**Aiming for Reality in Cutting-edge
digital Content Creation**

■Coordinator

Aiming for Reality in Cutting-edge Digital Contents Creation

Mr. Hideichi Tamegaya

Professor, Graduate School,
Joshi University of Art & Design



Major Changes

Since President Obama took office, changes are under way in all walks of life in America and not simply politics and industry. The 2009 NAB Show held this April was organized under the slogans "Where Content Comes to Life" and "IMAGINation" (a coined term combining "Imagine" and "Nation"). Conversion to digital TV (DTV) by blocking full-power TV stations' analogue transmissions were scheduled for February 17, 2009, however, complete conversion was pushed back 4 months to June 12 due to intervention by the new government.

One could argue that the acceleration of an international economic crisis; the likes of which only comes about once every 100 years; is currently exposing the media industry to major changes. Japan, which is aiming for conversion to completely digitalized TV by 2011, also finds itself in exactly the same situation. However, nations adopting the Japanese-style digital broadcasting system "ISDB-T" has grown to 5 nations in the South American continent, and together with the expansion of Japanese technology across the globe, promoting the international expansion of contents that exploit such technology has become increasingly important.

Held amid such major changes, the InterBEE 2009 symposium will drive discussion on the theme of "Aiming for Reality In Cutting-edge Digital Contents Creation", looking at it from a user viewpoint.

Technological Evolution and Expanding Domain of Expression

Supported by HDTV, movie film quality is currently advancing to a higher level of quality - an issue that is the domain of digital cinema. Efforts to expand movie film industry capacity are making headway through the improvement of video and audio quality and the achievement of stereoscopic 3D images exploiting evolving digital technology. Such efforts are discernible in image resolution exceeding HDTV called 2K (2048 x 1080 pixels) or 4K (4096 x 2160 pixels), and basic specs exceeding RGB 12-bit color space.

Super Hi-Vision (UDTV) is expanding the domain of video expression by achieving 16-times full HDTV resolution and ultra-realistic visual condition at 60 frames per second.

Making use of evolving technology does not simply involve increasing image resolution or creating stereoscopic 3D images. Rather, one could argue that fully grasping the technological specifications of such systems and creating realistic contents is the most important and creative approach to maximizing technological advancements.

In order to make the most of evolving technological capacity as well as creating a rich video culture that provides people with good story-telling, collaboration between all people involved with contents production including R&D researchers and equipment designers is as crucial as contents creation.

At this Symposium, we will hear lectures by R&D researchers and experts in the field of video production, presented from a contents production-side viewpoint. These lectures will provide details of case studies concerned with technological advancements and the pursuit of quality improvement through such advancements. It is hoped that this Symposium will drive discussion between panelists and symposium attendees on the theme of "Aiming for Reality In Cutting-edge Digital Contents Creation."

Profile:

- April 1960 Joined Japan Broadcasting Corporation (NHK)
- March 1966 Graduated from Department of Telecommunication Engineering, Tokyo Denki University
- June 1991 Media International Corporation (MICO)
- June 1995 Executive Engineer, NHK Broadcasting Engineering Department
- June 1998 Executive Consultant, NHK Broadcasting Engineering Department
- April 2001 Professor, Department of Media Arts, Joshibi University of Art and Design
- April 2005 Professor, Graduate School, Joshibi University of Art and Design (present)

Hideichi Tamegaya began introducing computer graphics (CG) technology in broadcasting program production in 1981.

He has developed CG systems through many advanced program productions. He designed a new production methodology concept, "Electronic Palette," to integrate HDTV and digital technologies for the movie production. The concept has been presented to Hollywood and other motion picture industries. Joining Media International Corporation (MICO) in 1991, he has been providing technical consultation and support on domestic and international HDTV, CG and digital media technologies to NHK and other production teams filming HD programs. He made it possible to mount a HDTV camera on a space shuttle for the first time in the world in 1998. He has served on various research committees and councils of the Ministry of Internal Affairs and Communications, the Ministry of Economy, Trade and Industry, and the Ministry of Education, Culture, Sports, Science and Technology, and he is currently working for promotion and development of the digital content industry.

- 1983 The 12th Ogura-Saeki Award of the Motion Picture and Television Engineering Society of Japan
- 1997 The High-Vision Awards 97 "The President's Award of the High Vision Promotion Association"
- 1999 The High-Vision Awards 99 "The Minister of Posts and Telecommunications Prize"

Tamegaya is a member of the following associations:

- The Association for Computing Machinery' Special Interest Group on Computer Graphics (ACM-SIGGRAPH)
- The Japan Society of Image Arts and Sciences
- The Motion Picture and Television Engineering Society of Japan
- The Institute of Image Information and Television Engineers
- The Japan Virtual Reality Society

■ Coordinator

**Aiming for Reality in Cutting-edge
Digital Contents Creation****Mr. Seiji Kunishige**

Director, A Member of Executive Board,
NHK Art Inc.



Profile:

Seiji Kunishige, born in 1952, has been specializing in development and implementation of three-dimensional CG production systems for TV broadcasting at NHK since 1983. He is also focusing on development of efficient and effective image creation and production methodologies using above-said systems.

As a Technical Producer since 1985, he has been using motion capture and other CG systems developed by NHK, special-effect, image-synthesizing and CG technologies to promote application of the high-quality digital VFX image content creation to the production of broadcasting programs, utilizing the features of hi-definition images.

Since 1996, he has promoted the development of "single-source, multi-output" data conversion technology to send various broadcasting program contents to a wide range of transmission circuits including the Internet and data broadcasting. He has also been involved in development and production of efficient and effective digital contents. Furthermore, he is promoting studies on new workflows and personnel training in the area of digital VFX image content production, from the perspective of total digital production covering special-effect filming, in-studio filming, CG, image synthesis, editing, etc.

In 2008, he started promoting content development and production for new digital video, etc., which was made possible by collaborating and merging technology with art design. Currently, he is promoting the application of contents, including 3D digital video, to real space, such as theaters (halls).

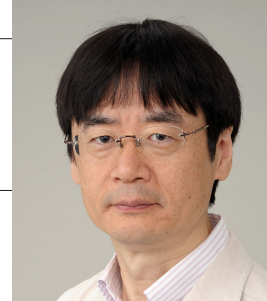
In 2007, he was appointed a part-time lecturer of the Graduate School of Interdisciplinary Information Studies of the University of Tokyo.

He has served Inter BEE International Symposium (Video Production) and Tutorial (Video Production) as a coordinator and the MC since 2002. He worked as a research fellow at MIT (Massachusetts Institute of Technology) Media Laboratory from 1985 to 1986. The awards he has received include the 13th MULTIMEDIA GRAND PRIX Industry Prize and the 10th Broadcasting Program Technology Award of the Institute of Image Information and Television Engineers. He is currently a member of the Society of Motion Picture and Television Engineering (SMPTE), the Japan Society of Image Arts and Sciences, and the Institute of Image Information and Television Engineers.

■Presenter

Work-specific technological development and the role of workflow**Mr. Ken Anjyo**

Digital Effects / R&D Supervisor,
Research & Development Division, OLM Digital, Inc.



Profile:

While promoting R&D and practical use of video production technology in the R&D sector, Mr. Anjyo gives technical direction for work production. He has overseen the theatrical version of the Pokémon movie (latest work between 2001-2009 includes the theatrical version of "Pokémon: Arceus and the Jewel of Life") and the TV series "Monkey Turn" and "Monkey Turn V" (2004), and the full 3DCG short work "One Pair" (2008).

He has also been actively involved in "usable" technological development collaborations between domestic and overseas researchers and technicians as well as CG international conference research presentations, starting with SIGGRAPH. He has also acted as an executive committee member for a variety of international conferences, primarily including SIGGRAPH ASIA 2009 Sketches and Posters Chair, SIGGRAPH ASIA 2008 Technical Papers Committee/Sketches and Posters Committee, International Symposium on Non-photorealistic Animation and Rendering (NPAR2008) Conference Co-chair.

The short work, "One Pair", which was adopted by the SIGGRAPH 2008 Computer Animation Festival and ARS Electronica 2009, is a full 3DCG work and the first of its kind produced by our company.

Technological problems included the development of the original software, Feather System, to create a realistic rendering of bird feathers with RenderMan; and the establishment of a workflow to accompany it. This Seminar will first introduce this work and outline the trial-and-error involved in solving these technological problems. In actual fact, we had not only considered applying Feather System to this work. It was subsequently improved and new functions were added, and it was used in a number of ways starting with production of scenes depicting vast flower fields in the theatrical version of the Pokémon movies. I will be discussing developmental processes such as these used for Feather System. Furthermore, I will also introduce the development and application of other original tools used to depict crowds and Toon Shader among others.

When developing work-reliant tools, there is a tendency for such tools to be unusable with other works. In order to maintain a fundamental approach towards enhancing the development of pre-built software tools and workflow and applying it to subsequent work creation, research and development (R&D) plays a significant role. Therefore, in conclusion, I will be giving my own opinion on the current and future role of R&D in digital production.

■Presenter

Realism and Representation**Mr. John P. Lewis**

Senior Lecturer, Massey University,
WETA Digital limited



Computer graphics in films has become nearly "photo-realistic" in the last several years, with human virtual actors appearing in several movies.

It seems that the famous "uncanny valley" has just been crossed.

On the other hand, these achievements are tenuous: a simple psychological study shows that in some cases viewers can correctly distinguish between realistic computer generated faces and true photographs in as little as 250 msec.

While something is clearly missing, viewers also cannot specify what is wrong, at least with the level of detail necessary to isolate and fix the problem.

In these failure cases, current images with their astonishing near-realism serve as "representations" rather than "reality". Audiences are sometimes satisfied with less-than-photoreal representations, even after having experiencing glimpses of true photo-realism. Human perception is both surprising flexible and surprisingly fallible. In another psychological demonstration, viewers "forget" correct human facial proportions and instead prefer distorted faces. In the future we may see an increasing variety of "hyper cartoons" – representation styles that have many elements of realism yet differ from reality in an increasing variety of ways. Mastery of full realism will provide the skills necessary to go beyond realism.

Profile:

J.P. Lewis is a research programmer at Weta Digital, specializing in computer vision and statistical learning techniques applied to film effects. He is also a Senior Lecturer (part-time) in the School of Engineering and Advanced Technology at Massey University in New Zealand. In the past he worked at academic and industrial research labs including the University of Southern California and Stanford University, as well as in the film industry at Industrial Light and Magic, Disney's Secret Lab (where he was Director of Research and Development), and ESC. He has credits on films including Forest Gump and The Matrix Reloaded.

John has published more than 40 papers in journals and conferences including ACM SIGGRAPH, Transactions on Graphics, I3D, Sandbox, IEEE CG&A, TVCG, and others. His algorithms have been adopted in Matlab and commercial graphics software packages, and his Pose Space Deformation algorithm is the subject of several industry implementations. He was also co-developer of the image-domain skin subsurface approach that has been further developed by Nvidia and ATI and is appearing in upcoming games titles.

John spends a portion of his time at Weta fostering collaborations with academic researchers in New Zealand and abroad.

■Presenter

Striving for reality in contents creation**Mr. Atsushi Saito**

Manager, R&D Section
Sega Sammy Visual Entertainment Inc.



I will be showing a demo reel introducing Sega Sammy Visual Entertainment Inc. (SSVE), and explaining works we have worked on to date.

SSVE's company objective to provide entertainment using world-class CG animation has not wavered since the establishment of its predecessor – the research and development (R&D) division of SEGA VE. Achieving this requires a world class production environment, work division system and R&D. Therefore, I will discuss the mission of SSVE's technical division and explain my own position as its leader.

To introduce details of our works, I will be commenting on how the video division liaises with the game development division and the kind of technology used in production. For this, I will be drawing on video production examples such as the game titles "Sonic World Adventure", "Like a Dragon" and "Project Diva Original Song." Video for "Like a Dragon" and "Project Diva Original Song" was produced using real-time technology for games in addition to pre-rendering. I will also explain how workflow utilizing RenderMan was used for "Sonic World Adventure."

"Night of the Werehog" is an originally designed short video based on "Sonic World Adventure." I will comment on the production technical side that evolved from "Sonic World Adventure" while touching on aspects of full CG animation originally targeted by SSVE.

From the viewpoint of a technical leader, I will comment on SSVE's distinctive technology. I will introduce development results achieved to date including the development of systems such as the pipeline system and in-house render management which support work division organization, and the Fur system and point rendering system which are only supported by RenderMan.

As a final summation, I will discuss the direction of future R&D aimed at generating increased video reality.

Profile:

Mr. Saito graduated from Tokyo University's Faculty of Science majoring in Computer Science in 1999. From the same year onwards, he participated in the production of "Final Fantasy: The Spirits Within (2001 Release)" as well as "Kilauea", the next-generation global illumination renderer R&D project, at Square USA's Honolulu studio.

In 2006, he participated in the establishment of the "VE Research and Development Division" specializing in CG video production at Sega Corporation, and headed up video production technology development.

When that division was split into Sega Sammy Visual Entertainment Inc. in June 2009, he was one of the founding members.

■Presenter

Workflow and visual design for the full CG animation film “Yona Yona Penguin.”**Mr. Toru Shinozaki**

CGI Supervisor



A large number of cel animation has been produced in Japan to date. One characteristic of Japanese cel animation is the pursuit of reality images that differ from live action. Inspiration to produce the full CG animation “Yona Yona Penguin” was received from the director Rintaro who called for “CG animation incorporating a reality style unique to Japan by making use of cel animation know-how cultivated up to now.” At this lecture, I will introduce how cel animation characteristics have been reflected in CG animation works by introducing their workflow and visual design.

Profile:

Mr. Shinozaki was born in Niigata Prefecture in 1970. In 1991, he graduated from Toho Gakuen University's Department of Broadcasting Arts Broadcasting CG program, and subsequently became a part-time lecturer at the same university. He also worked freelance for Uchida Yoko Co., Ltd's digital communications business division.

He was awarded a prize in the animation section at the Japan CG Grand Prix (hosted by the Graphical Processing Information Center) in 1991. He participated as a CGI supervisor for the “Yona Yona Penguin” animation due to be released in December this year.

Other main works he has participated in include structure design for “Metropolis” (2001); CG art director of “Innocence” (2004); video director of “One Stormy Night” (2005); and creative director of the DVD, “Prologue of Blame.”