FROM THE EXECUTIVE DIRECTOR

This issue of the ETC@USC Quarterly highlights some of the momentum building around our signature projects. This is particularly evident in Project Cloud, our Digital Town Square programs, and continuing study of Ultra High Definition.

A year ago, Project Cloud established a governing body and parameters for study. Now, working groups have presented tangible proposals. Our first complete year of Digital Town Square (DTS) meetings introduced many new to ETC, diversified viewpoints and surfaced common interest and need for further study in areas such as production workflows, metadata and virtual reality. A hot topic after CES was UHD and we've since continued the conversation. Get ready for CES2015! ETC will bring you extensive coverage, beginning with previews in December.

- Kenneth Williams

VR HEADSETS ON: DIGITAL TOWN SQUARE EXPLORES VIRTUAL REALITY

Virtual Reality: Maturing Before Our Very Eyes attracted scores of creative technology leaders and exclusive product demonstrations at ETC's Digital Town Square meeting held at the Maker City LA (The Reef) on November 5, 2014. Exhibitor companies, Reel FX, Leap Motion, Kite & Lightning, Samsung Research of America, Wearality, Sixense Entertainment, Emblematic Entertainment Group, Otherworld Interactive, Fox Broadcasting, Immersive Media, WemoLab, Sony Computer Entertainment Inc., Control VR, Jaunt, Metaverse, NextVR, Qualcomm, DreamWorks Animation, provided the attendees a real VR experience.

The Digital Town Square forum, designed to provide studios and technology companies with a safe harbor environment where issues and opportunities with emerging technologies can be discussed openly, explored such questions as what is virtual reality, what are the potential entertainment applications, what have we learned from the past two decades of work in VR and stereoscopic 3D, what will be the form of narrative stories, how will content be created, how can we design a healthy user experience, and what is the business proposition?

Mark Bolas, associate director of USC's Institute for Creative Technologies and associate professor, Interactive Media at USC's School of Cinematic Arts, provided a lead-off overview. His groundbreaking research in theoretical models of virtual reality, development of immersive displays and more recent efforts in low-cost virtual reality are in part responsible for the current VR revolution. Bolas noted that advances in image quality and realism produce a "presence" in virtual reality that he predicts will become a cultural norm.

Artist, educator and researcher, Michael Naimark, considered the form and nature of VR content and showed progressive projects from individual experiences to large group and special venues. Of particular interest in his presentation were ideas on coverage, input, navigation and manipulation: what is seen and how we interact with and influence what we see.

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DTS: Panelists Explore Latest Developments in VR

A panel featuring Richard Marks, director of Playstation's Magic Lab, Jody Medich, principal UX designer for Leap Motion, Amir Rubin, president and CEO of Sixense, and David Smith, CEO of Wearality looked at what's next in VR consumer technology. Rules are different in VR because the user is immersed in the action and environment. Not only must imagery be convincing but motion seen must be congruent with the users' action. Panelists also noted that spatial audio is far more important in VR than it is in traditional media, and may in fact be more important than image resolution.

Brad Herman, founder of DreamWorks Animation's DreamLab, compared VR to a theme park ride and provided attendees with a sound picture of the real-world business opportunities in VR. While the present market is limited, he projects it will be meaningful on a studio scale within 3-5 years.

Qualcomm, which sponsored the DTS event, highlighted their Vuforia technology and software developer kit for digital eyewear. You can learn more & sign up for the beta at http://vuforia.com/VDEinfo.

The ultimate question of storytelling in VR was the topic of a panel moderated by visual effects and digital production executive, Cliff Plummer, and featuring Nonny de La Pena, a documentary fillmmaker and fellow at USC's Immersive Media Research Lab; Matt Gratzner, founder of New Deal Studios and director of the VR short, The Mission; animation director Sascha Unseld; Felix Lajeunesse, co-founder and creative director, Felix & Paul Studios; and Chris Milk, director, Radical Media. VR is about "doing things" and is more powerful and visceral. "It is like learning a new language," said Milk. "At first you don't understand. But over time, we learn."

Digital Town Square Realizes the Promise of Ultra High Definition

On June 12th at the London West Hollywood, top industry thought leaders and product experts from the major consumer electronics companies conducted a 360˚ discussion on Ultra High Definition at the ETC@USC Digital Town Square, "Realizing The Promise of UHD."

With adoption rising as price points for UHD televisions drop into the range of consumer affordability and positive experiences on production community dispelling some early fears, filmmakers, display manufacturers, senior executives, and technologists from the content supply chain at studios, networks, and post-production/distribution companies and vendors participated in an interactive forum examining the options that will further the artistic and business interests of the entertainment and CE industry while delivering a demonstrably improved viewing experience. Among the topics of focus were resolution, high dynamic range (HDR), high frame rate (HFR), post and distribution workflows, new compression and color space solutions, UHD TV innovations, refresh rates, and other settings.

Warner Bros.' Wendy Aylsworth, Sony Pictures' Bill Baggelaar, Sony Electronics' Nick Colsey, Sharp Labs of America's Jon Fairhurst, Chris Fetner from Netflix, Joe Kane, longtime consultant to Samsung, flimmaker Howard Lukk, N (Nandu)Nandhakumar of LG, cinematographer Daryn Okada, Dolby's Dave Schnuelle and Comcast's Yasser Syed, participated in discussions moderated by Jim Houston.

Against the backdrop of rapidly advancing camera technologies and the explosion of home viewing, the panelists explored new practices, technologies and standards now being proposed to address image quality, the creative process, storage and transport roadblocks, the audience experience, and more.

ETC Leads SiliconBeach@USC Panel

ETC executive director & ceo, Kenneth Williams, moderated "From 20:20 to 2020 - The Future of Digital Content," a panel discussion at the Silicon Beach@USC Conference held at USC's Ronald S. Tutor Campus Center on October 29th. Williams' panelists included Lee Waterworth, founder and CEO of Yekra, a distribution platform for independent producers; John Driver, CMO, Packet Video; and Leigh Collier, EVP of bBooth. Panelists marveled at the growing audience and their active participation in production and distribution. For example, bBooth provides kiosks where ordinary people can make professional audition videos. The market, it seems, is moving beyond "content everywhere" to "content from anywhere."

CONVENE

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ETC Presents Project Cloud at SMPTE Meeting

The inevitability of The Cloud and it's accelerated transition brought together familiar partners as ETC@USC headlined a presentation of Project Cloud to the Hollywood section of SMPTE (The Society of Motion Picture &Television Engineers) held at the Linwood Dunn Theatre at the Academy of Motion Picture Arts & Sciences.

ETC and SMPTE enjoy a longstanding collaborative

relationship, having worked together on several projects including the rollout of Digital Cinema and IMF (Interoperable Master Format). A goal of the June meeting was to familiarize SMPTE with the current activities of ETC@USC and the scope of Project Cloud. ETC's presentation demonstrated areas of common interest such as metadata, transport and security.

SMPTE's program focused on new technological directions that are impacting the future creative aspects, production efficiencies and distribution of entertainment and movies.

The June meeting preceded SMPTE's Entertainment Technology in the Internet Age, a comprehensive 20-day meeting conducted on the campus of Stanford University June 17 & 18. As described by SMPTE, "The concept of this conference is to explore the 'old' and the 'new' in the context of the technology requirements for delivering a compelling entertainment experience over the Web."

PROJECT CLOUD UPDATE
May and October Meetings Introduce Common Solutions

Project Cloud working groups presented initial rounds of development specs and findings at the May 22nd update meeting at Sony Pictures Entertainment.

Transport, security and metadata management were three of the areas addressed in the most recent work.

The Transport team introduced a new workflow that brings the production ecosystem to the assets via Digital Media Exchange (DME). Carrier neutral and vendor agnostic, the proposed DME leverages the global scale of the Internet and incorporates Software Defined Networking (SDN), a bleeding-edge technology that is scalable, provides on-demand capacity and provisioning, reduces and controls latency, improves performance of collaboration tools and applications, and optimizes storage, among its features. A more complete presentation of the Digital Media Exchange was formally presented at the October Cloud Update.

The Security team has been working in concert with the Cloud Security Alliance (CSA) and the Motion Picture Association of America (MPAA). The CSA is a not-for-profit organization with a mission to promote the use of best practices for providing security assurance within Cloud Computing and is led by a broad coalition of industry practitioners, corporations, associations and other key stakeholders. The security team engaged the MPAA, a key objective, to incorporate the Cloud controls to facilitate the launch of a new branch of their Content Security program. The relationship and dialogue between these groups insures incorporation of appropriate security matters and measures.

C4 - The Cinema Content Creation Cloud, proposes an Open Source Domain Specific Language (DSL) for Cloud-enabled production tools. Source code for further development is now posted to GitHub for continuing development (see story on 4).

Part of the overall goal in Project Cloud is to bring various competitive organizations to work together in the development of an interoperable cloud framework. As the project moves towards a working prototype, the String team has developed a design template for a registry system, a critical first step. The proposed system will contain a user login, registration of new user, registration of asset ID with the service or registration of the service itself.

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LUNA
Lessons in Cloud-Based Workflows

"'Luna,' Lessons in Cloud-based Workflows," was an executive roundtable dinner featuring key industry speakers and a discussion of lessons learned during the production of "Luna," a short film produced as a proof of concept and screened at the dinner. WIPRO sponsored the October 20th screening dinner and panel held at Hatfields Restaurant in Los Angeles.

This Universal Pictures research project, designed and championed by Michelle Huynh, VP of Content Operations and Security, explored the possibilities and current limitations in cloud production. The short film, "Luna," directed by USC Cinematic Arts MFA candidate, Abi Corbin, was substantially underwritten by Universal Pictures with contributed funding by WIPRO and Equinix. Huynh worked closely with Corbin to incorporate a variety of production software and workflow scenarios to put them to the test. Universal selected the software vendors and determined what they hoped the test would accomplish. ETC helped execute Universal's plan to learn about practical applications and opportunities offered by current cloud technology to optimize production and collaboration across the creative process. The project discovered breaks and gaps warranting attention and brought forth a better understanding of the baseline. Challenges included integration of multiple cloud-based production software, metadata, framework, security, transport and archival.

Huynh described the scope of the project at the dinner and previewed findings that will be documented in a white paper to be published early in 2015. Corbin recounted her first-hand experience as a filmmaker managing an emerging production paradigm and then introduced the premiere screening of her short.

A panel of experts that included Digital Film Tree, Studio Pyxis, Corbin, and USC School of Cinematic Arts production chair and Academy Award-winning visual effects supervisor, MIchael Fink, discussed key issues to be addressed in moving production effectively into the cloud.

Project Cloud Announces Production Framework

C4, an Open Source Domain Specific Language (DSL) framework for Cloud enabled production tools, was announced by ETC, October 2nd at Disney. C4, an acronym for "Cinema Content Creation Cloud," provides for a unique identification of production assets at the time of their creation and facilitates association of that identification to each unique asset regardless of any other asset management systems or protocols.

A significant advantage to productions with this framework is that asset identification and tracking is consistent for all production elements even if other production specific identification systems are in use. This is especially useful wherever different protocols or conventions are used, even by different departments or individuals across a production or production studio. Where other widely adopted identification systems such as EIDR are designed for complete works and derivations, C4 begins at the inception point, enabling accurate identification, tracking and management throughout the production workflow and the assets' entire life cycle.

The framework describes front and back-end modularity, cross-domain asset management, desktop applications with cloud engines, massively parallel asynchronous systems, strong cryptography-based security, and physical and virtual resource management.

The C4 framework considers 10 essential components: assets, attributes, groups, links, processes, channels, resources, entities, security, and economics.

Documentation for C4 is now available on OpenStack (https://wiki.openstack.org/wiki/Milk) and open source code may be found on GitHub (github.com).

"The Art and Technology of Visual Storytelling"

Michael Fink, Professor, USC School of Cinematic Arts Chair, Production George Méliès Endowed Chair in Visual Effects, Kortschak Family Endowed Division Chair in Film and Television Production, presented a detailed look at the evolution of visual expression that spanned the history of civilization at the ETC Mega Session held in September at Warner Bros. Fink's presentation paid particular attention to the use of lighting, first in art and later in motion pictures, as a key instrument of expression.

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ETC BRINGS UHD PRIMER TO STUDIO LEADERS

Building on its study of UHD TV and its evening seminar at the Television Academy (see accompanying story), ETC has developed comprehensive primers on UHD TV and Virtual Reality. These primers are available as customized presentations to interested groups within the studios and other ETC member companies.

The presentations are designed as non-technical primers for anyone whose business will be impacted by these emerging technologies. They are ideally suited for marketing and distribution executives, business and corporate development, home entertainment, television and theatrical, production staff, and anyone seeking a better understating of UHD TV or Virtual Reality. The first trial of this offer, a UHD TV seminar and discussion given at Warner Bros. on July 31st, received strong, positive feedback.

Members are encouraged to ask ETC to develop presentations on any other topic related to entertainment technology that they would like presented to groups within their company.

This Primer program is an ETC Platinum and Gold member benefit.

ETC TEAMS WITH TELEVISION ACADEMY FOR UHD SESSION

ETC's Phil Lelyveld moderated a media panel on June 24th the "Ultra High Def Revolution." Presented by the Academy of Television Arts and Sciences at CBS Studios, panelists included Oscar- and Emmy-winning DP Dave Stump, ASC, Sony Pictures Television's Phil Squyres, and award-winning DP and lighting experts, Bradford Lipson and Greg Gardiner. Vendors demonstrating UHD solutions included Advantage Video Systems, AJA Video Systems, Blackmagic Design and Sony Pictures Entertainment.

The panel addressed how UHD technology is impacting the television industry and consumer viewing patterns. UHD adoption is expected to increase as prices for 4K TVs have dropped 85 percent worldwide in just two years. In 2013, 1.6 million UHD TVs shipped globally.

Enthusiasm was high among the panelists who noted that many of the initial reservations, especially related to cost and storage capacity, are proving to be far less challenging than anticipated. Even in the area of visual effects, where Dave Stump has considerable experience, does not require all effects shots to be created in 4K. In fact, many of the up-conversion techniques blend seamlessly with native 4K.

Phil Squyres, who has been pioneering high definition production for years, finds the new UHD pipelines to be incredibly efficient.   UHD mastering also prepares shows for the future, so much so that Sony has gone back and remastered 65 episodes of the hit "Breaking Bad" in UHD.

Other series that have turned to UHD include "The Blacklist" (NBC), "Masters of Sex" (Showtime), "Battle Creek" (CBS) and last season's "Rake" (Fox), which Gardiner shot in 4K.

Additionally, the Netflix hit "House of Cards" is now streaming in Ultra HD, while other streaming services such as Amazon and M-GO say they will offer 4K content soon.

Panelists discussed production challenges in moving from HD to Ultra HD, including the impact of 4K on lighting, set design and make-up. Bradley Lipson made particular note of the high dynamic range that simplified night exteriors, negating need and cost of extensive background lighting.

A recording of the entire session is available for viewing on the Television Academy website (www.emmys.com/video/ultra-high-def-revolution-technology-primer)

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USC GAME INNOVATION LAB DIRECTOR TRACY FULLERTON PRESENTS AT ETC MEGA SESSION

Tracy Fullerton, director of the USC Games Innovation Lab and chair of The Interactive Media Program at USC Cinematic Arts, provided ETC members an overview of USC's extensive work in game design, development and research. The USC program is ranked #1 for both its graduate and undergraduate programs. Fullerton herself is an experimental game designer, entrepreneur, and author of Game Design Workshop, a design textbook in use at game programs worldwide. The mission of The Game Innovation Lab, housed within SCA, is to pursue experimental design of games in cultural realms including art, science, politics and learning.

One example that she presented was current work on Walden, a game that simulates the experiment in living made by Henry David Thoreau at Walden Pond in 1845-47. Allowing players to walk in his virtual footsteps, attend to the tasks of living a self-reliant existence, discover in the beauty of a virtual landscape the ideas and writings of this unique philosopher, and cultivate through game play their own thoughts and responses to the concepts discovered there. The game posits a new genre of play, in which reflection and insight play an important role in the player experience. While traveling the virtual world of Walden, the players apply themselves to the daily task of maintaining the basic aspects of life at Walden Pond, in addition to focusing on the deeper meaning behind events that transpire in the world.

Fullerton also showed scenes from The Night Journey, a game project conceived by Bill Viola, an internationally acclaimed artist and MacArthur fellow, which uses video game technologies to explore the universal story of an individual mystic's journey towards enlightenment.

SPIELBERG SPEAKS AT IMAX THEATER AND IMMERSIVE MEDIA LAB DEDICATION

The Michelle and Kevin Douglas IMAX theatre and Immersive Media Lab, a 50-seat theater with a 46x24 foot screen, opened on June 4, adjacent to the ETC office in The Robert Zemeckis Center. The theatre and lab is the first of its kind to teach students how to use the latest technology for large format and immersive cinema.

"This gift is not only transformative for the research efforts of the school but, most importantly, puts the cutting-edge immersive storytelling, large-format filmmaking and virtual production tools in our students' hands," said Dean Elizabeth M. Daley.

The IMAX Theatre and Immersive Lab joins an already thriving interactive media culture at SCA's Robert Zemeckis Center, including a Performance Capture Stage and a World Building Media Lab. Students who use the lab will learn about immersive storytelling and virtual production in the IMAX medium, as well as large format filmmaking, immersive storytelling and cutting edge storytelling techniques, according to the university's announcement.

In remarks at the dedication, filmmaker Steven Spielberg observed that students today tend to work on the small screens of their tablets, phones and computers. The IMAX installation "expands their horizons" and "affords all of us [the opportunity] to include the world in our storytelling."

ETC plans to arrange an opportunity for its members to tour the new facility.

UPCOMING EVENTS

Dec 4th	Mega Session
Dec 8th	Cinegrid 2014
Jan 6-9	2015 International CES
Jan 21st	Sprockit Sync Meeting
Feb 9-13	2015 HPA Tech Retreat