

Achieving  
uniformity in a  
university-level  
projection-based  
AV System.

# Pervasive Projection at SMU's Meadows School

Ian Aberle



**Art History Professor Pamela Patton discusses the details of artwork using high-definition projection (left), and uses her laptop at the eNook to cover medieval art.**



Ian Aberle

## By David Sedman, PhD, & Dave Pollock

Audiovisual media have long been integral to education, but the proliferation of analog and digital media formats over the past 30 years, and the many kinds of visual content used at modern universities, can present a challenge for devising a reliable, optimum-quality presentation solution that includes a simple and consistent interface to serve the requirements of a wide variety of disciplines and teaching staff. The Meadows School of the Arts at Southern Methodist University recently faced this challenge.

### 35 Identical Presentation Systems

Working with AV Dallas, Canon, Crestron and other suppliers, we have installed 35 virtually identical presentation systems employing commercial AV projectors in our lecture arenas, performance halls, dance studios, theaters, conference rooms and classrooms. The Meadows School's two buildings are 50 and 60 years old, respectively, so the project faced a few challenges inherent in installing contemporary AV systems into older infrastructures. Nevertheless, the project was extremely successful and important lessons were learned in the process. The end result is that a fully contemporary AV solution with a consistent, intuitive interface is now present in each room, providing exceptional picture quality, detail, brightness and color, and the ability to effortlessly present new and legacy content of whatever kind a particular field of study or instructor requires.

*David Sedman, PhD, is Director of Technology and Associate Professor of Film and Media Arts at Meadows School of the Arts at Southern Methodist University, in University Park, Texas. Dave Pollock is the Founder/President of AV Dallas.*

Graduate and undergraduate programs at the Meadows School of the Arts include advertising, art, art history, arts entrepreneurship and management, film/television and media arts, creative computation, dance, music and theater, journalism and public relations. Visual content presented in classes can range from still images of classical artworks and medieval manuscripts, all the way to full-motion HD of classic movies and Skype video.

## HDMI Transition

Essential to planning this project was the gathering and serious consideration of a wide range of opinions and commentary from teachers and students as to how our AV capabilities could be improved. That said, an experience with a smaller scale 2003 upgrade taught us that achieving best practices can also include going beyond implementing requests for specific short-term improvements and, instead, devising a long-term concept capable of addressing not only immediate concerns, but also having the “headroom” to assimilate the changes that ever-evolving digital AV content formats inevitably will present. Or, put another way, why go through the trouble of pulling multiple cables to connect legacy playback devices that may output less-than-optimal imagery and have the potential to stop being used in 18 months?

Faced with this reality, the project’s team determined that the Meadows School would transition from VGA-connected equipment to HDMI, the advanced digital audiovisual interface. In so doing, this transition would be one from a legacy “Swiss Army Knife” situation, in which each lecture arena, dance studio or classroom had its own unique collection of AV equipment (which included a Mac and a PC laptop, and might also include anything from an audiocassette deck, to a 35mm slide projector, to a record turntable and different kinds of video projectors), to what has been described as the “inverted classroom.”

This concept calls for the seemingly paradoxical situation of limiting the number of content inputs while not limiting the variety of content that can be displayed (and heard). This streamlined, inverted classroom would have all content played back from an HDMI-connected laptop or a Blu-ray

player. Breaking free of our VGA-based “standard-definition” systems and transitioning to high-definition and HDMI in one fell swoop presented a bit of a curve for everybody involved in this project, but it has been well worth it.

## Equipment Choices

Paramount to our plan was the selection of a projector that would fulfill all of our requirements and provide a consistent viewer experience across the many different types of learning environments in the two buildings that comprise the Meadows School of the Arts. Our requirements were many. They included the need to clearly reveal intricate detail for projecting CAD diagrams in such classes as theater design, accurately calibrated color for viewing the great masterworks of art history, precise motion rendition and exacting monochrome reproduction for showing classic black-and-white films in cinema studies, and sufficient brightness so blackout shades aren’t required to view and take notes for even a simple PowerPoint presentation.

Working with AV Dallas, several projector manufacturers cooperated in a “shootout” among different brands and models. During this process, we were mindful of comments from the art history department about its need for an accurate color-calibration capability and the avoidance of the “screen-door effect” seen in some projector displays. Cinema Studies also noted that some people got headaches from projectors using color-wheel technology.

When we saw the images produced by the Canon REALiS WUX5000 and WUX4000 ProAV native widescreen WUXGA resolution (1920x1200) multimedia projectors, however, we all said, “This is it.” These projectors employ LCOS (liquid crystal on silicon) display technology for smooth, lattice-free imagery and higher-than-HD image quality. They also provide advanced color management, high brightness, and they can be outfitted with four different Canon projection lenses, including long-focus zooms and an ultra-wide lens. Seeking to optimize the viewer experience to the highest possible degree, we saw that the Canon REALiS projectors far outperformed what we had been using. The REALiS WUX5000s output 5000 lumens and are in the larger rooms. The 4000 lumen REALiS

WUX4000s are in smaller rooms. Classrooms range from 60 chairs down to 20. In this way, we are able to standardize on one projection line to make all the rooms equal and interoperable.

## Another Component

Another key component in our new presentation solution are Crestron DigitalMedia controllers. AV Dallas worked with Crestron, which wrote custom firmware to control the Canon REALiS projectors from Crestron Designer touchscreens, which provided a consistent interface in each room. Other important hardware components include Samsung Blu-ray players and 35 new Da-Lite HD Progressive screens. The combination of these screens with the projectors is quite impressive.

Because the “A” is just as important as the “V” in “AV,” we made sure that our systems could also deliver the best sound, which is especially crucial for our music department and for the audio specialists in cinema studies. Due to the close proximity of each room and the absence of soundproofing, we had to ensure that the loudness of these sound systems would not bleed through to adjacent rooms.

After researching available products, we standardized on JBL speakers. Some rooms have dropped “plenum” ceilings that, in two locations, enabled the installation of in-ceiling audio amplifiers and 5.1 surround-sound speakers. The rest are equipped for wall-based amps and stereo speakers. As with all equipment choices, technology transparency and uniformity were key goals.

## Design & Installation

Cat5 Ethernet cable, already installed in several rooms during our previous renovation, was added to others for control of the projectors, each of which includes an RJ45 connector. The task of delivering Cat5, HDMI and electrical power to each projector varied from room to room in our 50- and 60-year old buildings. Where drilling for wiring conduits was not possible, Panduit was used to mount and run cables on wall and ceiling surfaces. Although rooms with dropped ceilings presented crawlspaces with limited mobility in which to work, a careful and methodical approach to the unique design of each room proved to be the right approach for achieving the uniformity we sought



Projector in classroom

## Tips

- Gather a diverse array of opinions when updating an AV system, but use “big picture” thinking in planning its replacement.
- Aim for simplicity on the user end. No matter how advanced your technologies may be, the success of your AV system will depend not only on exceptional image projection and sound, but also on whether the system is easy for users to operate.
- Train all teachers who will be operating the system to ensure a positive user experience.

## Gear

Canon REALiS projectors  
 Chief mounts  
 Crestron automation control systems  
 Crestron Designer touchscreens  
 Crestron DigitalMedia room controllers  
 Da-Lite screens (manual and electric)  
 JBL speakers  
 Samsung Blu-ray players

for each installation.

In addition to integrating the Cat5 IT and HDMI AV cabling required for each installation, electrical power also required careful attention. Power-surge and battery backup/UPS equipment in strategic locations provided the required consistency in the electrical system. All but one of the projectors are ceiling-mounted, using Chief mounts.

## Inverted Classroom Concept

In keeping with the inverted classroom concept, each room includes an “eNook” that resembles (and is affectionately called) a “diaper-changing station.” All content is played back from there using either the HDMI-equipped laptop or internet-connected Samsung Blu-ray player. This provides local playback control and the ability to change media at a moment’s notice, as opposed to media being relayed from some central location (other than the internet). The school has a laptop standard in place, based on a lease program, which ensures that everyone has the same model.

In order to ensure that analog and other legacy content can easily be integrated into our AV projection systems, both buildings at the Meadows School of the Arts include a student-centered technology information and transfer facility known as TechEffect. There, all legacy formats can be converted to the highest possible digital quality. TechEffect is equipped with a wide array of playback devices, including audiocassette decks, a 35mm slide scanner, record turntable, and even a rare VHS deck with an HDMI output. In this way, we can make sure that all the material can be digitized in high enough quality so it looks and sounds its best in each room. Also, guest lecturers who may wish to use an older VGA-connected laptop can use a checkout VGA-to-HDMI converter.

## Faculty Feedback

Here is what some of the folks at the Meadows School of the Arts had to say about the new AV system:

“The new system is a boon to teaching historically important films because we are able to give students a far more accurate sense of how these films looked to their original audiences,” noted Rick Worland, Professor of Film & Media Arts. “It makes the work of outstanding filmmakers of the past more accessible and treats their work with the respect it deserves.”

“The increase in projection quality was

immediately noticeable when you put in the new systems...making for sharper edges and cleaner curves in all the images,” commented Pamela Patton, Associate Professor Art History. “Details are *much* easier to read as well. The new system also works very well with the hi-res image viewers that many libraries make available for studying manuscripts in their collections. Other kinds of images I use in class are also improved with the new system: sculpture, architecture, wall painting, ivories, but the manuscripts are where I most notice the difference.”

“As a technology team, we have standardized and implemented projectors throughout our classrooms several times previously,” explained Jason Warner, Digital Arts Solutions Architect. “Our objectives have always been to provide the highest possible end-user experience, while at the same time working within a manageable budget. With every previous installation, laptop and AV content playback has been very effective, but achieving ‘remarkable’ quality—especially in the eyes of our artistic disciplines, at a sustainable price point—proved elusive or cost prohibitive.”

Warner continued, “As we consider projectors that must serve in huge lecture arenas, performance halls, dance studios, theaters, conference rooms and classrooms—serving a population of digital artists, AutoCAD stage designers, filmmakers, photographers, students, and the general faculty and staff population—the Canon projectors served them all and are well-suited for everything we’ve thrown at them.

Being able to project in native HDMI at 1920x1200 with the lights on and windows open allows us to fully leverage the digital output capabilities of our faculty laptops, along with advanced Blu-ray playback to deliver equally remarkable user experience and quality throughout our stable of artistic disciplines.”

As an educational institution that understands the value of training, we conduct trainings that instruct teachers about the use of the new AV system prior to each semester. We have also instituted a “Leveraging Laptops” series that maximizes the use of mobile computing devices, which highlights the services provided by TechEffect for converting legacy media.

## Lessons Learned

An AV upgrade is a great opportunity to

*(continued on page 23)*

but on mission critical deployments, success comes with insights gained from previous projects and new learning. During the design phase of this project, we conducted extensive onsite research and discussed client needs with the team. We noted the myriad inputs (local workstations, dedicated computers for monitoring utilities, existing analog security cameras, new digital security cameras, etc.) that would be required to display the information from these sources on the videowall.


We ensured that sightlines to the videowall were maintained despite a low ceiling. Potential projector noise and excess heat output due to close proximity of projectors to personnel were minimized with the LED-based projectors. During the commissioning phase, our team also worked closely with the end users to generate videowall window layouts most useful to them.

One of the lessons learned from working on high-use systems such as this is to always include in the AV specifications additional time during commissioning for the AV integrator to tweak the system's user interface

## SMU'S MEADOWS SCHOOL

(continued from page 16)

take advantage of the latest digital technologies. There were several important lessons learned along the way (and during previous upgrades), and these included the need to work with trusted designers, systems integrators, installers, product dealers and manufacturers who "play well" together. An important part of that is making sure they respect and integrate your input and ideas. You, however, must also be willing to be open-minded about their recommendations.

Also important is the need to evaluate your components. Manufacturers should be willing to participate in "shoot outs" or individual demonstrations of their products. Choose the ones that satisfy your list of requirements. Yet another important lesson was the need to integrate legacy media formats so end users never feel as if they are being forced to abandon time-tested teaching tools. A TechEffect-style facility is an excellent way to do this. 

and programming to the end user preference. It may take multiple rounds of training to gather the appropriate feedback from all personnel who will be using the system, but the effort could save service calls and frustrations later.

### Worth The Time

It is worth the time to get familiar with your client's standards and protocols personnel regarding AV equipment that can be serviced in-house because they may want to have an instruction set, especially to minimize downtime in cases of emergency.

It also pays off in the long run to request that the IT department review its connections to the AV system (individual workstations sending video to the videowall, tie-ins with building network, etc.) during commissioning to ensure that its equipment and AV equipment are functioning as expected.

The new Service Response Center at Texas Children's Hospital is fully functional, meets the current needs of end users, and is designed for easy future expansion. It is rewarding to see our design efforts come to fruition.



Come see us in Orlando, FL at **Booth #1975**

Please visit our website at  
[www.hallresearch.com](http://www.hallresearch.com)  
to get your free pass!

**infoComm13**  
INFORMATION COMMUNICATIONS MARKETPLACE  
Exhibits: June 12-14

## 8X8 HDMI MATRIX SWITCH WITH RS232 AND IP CONTROL



HSM-I-08-08

- Compatible with HDMI version 1.4a (for color-depth and 3D), and DVI
- HDMI Audio De-embedding & Independent Routing to SPDIF outputs
- Supports a wide range of HDTV (HDMI) and PC (DVI) resolutions from 480i to 1080p and VGA to WUXGA
- Supports digital video formats in Deep Color to 12bit per color

## 8 CHANNEL HDMI VIDEO SPLITTER/EXTENDER



SP-HD-8A

- Splits an HDMI source to 8 outputs without loss
- Supports HDMI 1.4 deep-color and 3D formats
- LED indicators for power, source signal, and 8 outputs
- Includes 1RU rack mount ears

CONTROL

SCALE

EXTEND

SWITCH

SPLIT

**HR HALL RESEARCH**  
A New Wave In Connectivity

714.641.6607

[www.hallresearch.com](http://www.hallresearch.com)

