New Emerging Technologies Push The Future In Ryerson's Mixed Reality Production Cluster

From: Office of Program Director, Operations and Technology, Rogers Communications Centre

May 1, 2010 - Ryerson Universities Faculty of Communication and Design's (FCAD) Mixed Reality Production Cluster resulted from a multi-year collaborative process between the Schools of Image Arts, Radio and Television Arts and the Rogers Communications Centre (RCC). Opening in 2007 the cluster of flexible labs was designed to meet expanded program requirements relating to New Media across all of the FCAD's schools. The requirement for New Media was central to curricular changes that occurred in the school of Radio and Television Arts and integral to the delivery of the New Media Program by the School of Image Arts. Now operating in its third year the cluster has become a key teaching resource for FCAD's Graduate Programs. Those programs now include Communication and Culture (PhD, MA), Media Production (MA), Documentary Media (MFA), Journalism (MJ) and Professional Communication (MPC). The area has also met expanded academic requirements in the School of Interior Design and for The Chang School of Continuing Education. *above image (CC) Eva Blue

Since the cluster relates specifically to the delivery of New Media curriculum and its quick moving technology, equipment must be renewed and sought out on an annual basis to support the change associated with rapidly advancing communication technology. Technologies added to the cluster for 2010 were identified by a multi-school committee that oversees the cluster and is charged to oversee the acquisition of technologies. This year's introduction of technologies to the cluster relate to GPS, augmented reality, digital photography, 3D, stop frame animation, media streaming, PICO projection, mobile, input devices, and audio production. As well new technologies assist traditional video shooting with the acquisition of green/blue screens and location production lighting.

Newly Acquired Input Devices Provide Improved Drawing, Touch 3D scanning and Neuro Control For Interactivity

Newly acquired input devices will address a number of areas where the cluster was lacking and improvements were requested. To start the cluster has obtained its first 3D scanner in the form of Nextengine's Desktop 3D Scanner HD. The scanner contains a high-definition laser array and sensors and a point density 400% higher than in the previous model. Colour capture for textures is also improved as the Scanner HD captures a wide colour gamut scanning objects at a high speed. http://bit.ly/bg6KLY

To assist the Advanced Presentation class of the Masters Of Professional Communication an Epson Expression 10000XL large format (12.2" x 17.2") photo scanner has been obtained for the Visual Computing Lab. The scanner has 2400 dpi resolution --higher than any other B-size flatbed scanner available today - plus a 3.8 Dmax and 48-bit color. http://bit.ly/28FwNI

For artists that are used to drawing using traditional tools the labs are now equipped with the Wacom Cintiq family of interactive pen displays. They enable students to work using professional pen technology directly on the surface of an LCD display. The lab offers two options for working directly on screen; the large-format, second-generation Cintiq 21UX, http://bit.ly/9wiu5b and the low-profile Cintiq 12WX. http://bit.ly/aozg3x or those who just want to draw on a surface Wacoms Intuos4 surfaces (8.8" X 5.5") and pen technology have been obtained for use in the lab. http://bit.ly/dk1OJH

Perhaps the most interesting of the devices and based on the latest developments in neuro-technology, the MRL has obtained an Emotiv EPOC. This device is a high resolution, neuro-signal acquisition and processing wireless neuroheadset. It uses a set of sensors to tune into electric signals produced by the brain to detect thoughts, feelings and expressions. It connects wirelessly to most PCs. The unit was purchased with a single license Emotiv SDK Developer kit. This will allow for development of installations that will use thoughts, feeling, and emotion to dynamically interact with color, music, and art. http://bit.ly/9g1wDZ

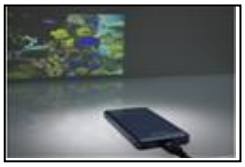
To better deal with the emergence of TouchScreen display the cluster has obtained an Acer T230H touch-activated display solution. This technology made available via Windows® 7 enables additional functionality to work in the media area by enabling full control and motion via fingertips. The T230H is easy to use and the large digital Widescreen delivers powerful graphic performance at Full HD resolution. The unit is fully compatible with blu-ray devices, digital broadcasting and on line media. http://bit.ly/blEqIE

Digital Imaging advances with 3D, GPS and Augmented Reality

Technology added to the lab to deal with advances in digital photography include two SONY HX5V/B Cyber-shot® Digital Cameras. Each Camera features a 10x optical zoom, 25mm wide angle Sony G Lens, 3.0" screen, "Exmor R" CMOS sensor, Intelligent Sweep Panorama, 10fps at full 10.2MP, Anti-Motion Blur / Hand-held Twilight, AVCHD Movie mode (1920x1080@60i) and an integrated GPS receiver and compass recorder that provides the location and direction of every shot taken by the camera. This will allow images tagged with GPS data to be integrated into media software applications in unique ways including apps that address emerging field of Augmented Reality. http://bit.ly/9gtgv5.

For 3D photography the lab obtained a 10 megapixel FinePix REAL 3D W1 camera. This first to market 3D still camera is comprised of two Fujinon lenses and two CCDs integrated in a compact body that aligns the left and right lenses. The camera shoots 3D movie files and in 2D mode each lens can shoot pictures independently allowing one to snap a long shot and close-up at the same time. http://bit.ly/9M0Uj7

The lab also obtained new Eye-Fi cards that will work in its digital cameras and camcorders. Eye-Fi cards are wireless memory cards that stores media and fit into a regular SD/SDHC cardslot. The card has built-in Wi-Fi that uses a wireless network to effortlessly transfer photos and videos. With the ability to instantly transfer photographs and video's this technology will likely find application in numerous interactive installations developed by students in the various programs that make use of the cluster. http://bit.ly/bu6k2C



For PICO projection that relates to augmented reality applications, the lab has obtained an Optoma DLP EW330 Ultraportable Projector. The EW330 is one of the lightest (2.4 pounds) and brightest (2200 ANSI Lumens) digital projectors available in a compact design. (8" x 2.5" x 6.1"). http://bit.ly/byzJRU

For 3D immersive environments the cluster has added VR920 Video iWear. This technology is specifically designed to allow for immersion inside virtual worlds, MMOs and 3D games. The WRAP 920 is sunglass-style eyewear, with a virtual 67-inch screen as seen from 10 feet that displays both 2D and 3D video. With support for standard 2D movies as well as most 3D video formats, one can watch immersive media while sitting in a chair. To add an augmented reality component a camera is added to the front where a live camera feed can be augmented with additional information on the display. http://bit.ly/ioDRD

As well the Lab will be ordering the Wrap 920AR which is the world's first consumer 3D video eyewear with 67-inch displays as seen from 10-feet (3m) and a stereo camera pair that "looks" into the world, bringing mixed and augmented reality to life. The stereo camera pair, each capturing 752 x 480 images at 60 fps, delivers a single 1504 x 480 side-by-side image that can be viewed in 3D stereoscopic video on the Wrap eyewear displays. http://bit.ly/5FoGGX

Improved Video Production Environment

Improvements in shooting in the Electronic Field Production and Practice Lab include an improved Green Screen environment. A 5*7' Botero Rotary Background Support System with four backdrops (including Green Screen) was obtained, http://bit.ly/bSTHWC along with a Digital Juice Chroma Pop 5*7 spring loaded Green/Blue screen. http://bit.ly/c1BdFs The backdrop system will assist students in the Master In Professional Communication who will be required to shoot productions at a professional level.

To light the screens four wheeled floor stands holding Kinoflo Diva-Lite 201 fixtures will be added to the room http://bit.ly/9rcp0G along with two battery operated Bescor LED90K LED lights designed for video applications. The Bescor's have LED light housings with a built-in 4500K color correction filter and two 4-Section lightweight light stands. http://bit.ly/ch9LGN

To provide for unique angles and for use in the embedded environment the ContourHD cameras have been obtained. These devices are known as the World's First (and lightest) HD Helmet Camera. ContourHD is a wearable camcorder for shooting and sharing HD video. ContourHD allows for choice between crisp High Definition or smooth High Action SD, wire-free wearability and one button simplicity to shoot video. Light enough (4 ounces) to fit on goggles, this compact and rugged helmet cam makes HD quality video affordable in a one piece device. http://bit.ly/1aJ2tR

For Internet video that needs to be collected simply and on the fly, the lab has obtained two Q3 Handy Video recorders that brings Zoom's renowned audio technology to the camcorder, making it amongst the best sounding video camcorders on the market. http://bit.ly/dc86ae For those into "Flip" devices two Kodak Zi8 Pocket Video Cameras have also been secured for the lab. http://bit.ly/9ZEC5Z

Streaming Media, Gaming and 3D

For stereoscopic streaming the cluster has obtained a Minoru 3D Webcam that will allow for 3D web streaming. The Minoru 3D Webcam is a single unit with two cameras spaced about the same distance apart as human eyes, for the stereoscopic effect. This anthropomorphic camera is ideal as users tend to look into the eyes of the camera as they light up. The Webcam has a multi-position stand that can sit or stand on a desk, or perch on a monitor. The unit comes with 5 pairs of special coloured glasses to see the 3D image. The Minoru can be used with Windows Live Messenger, Skype, AOL instant messenger, OoVoo and other video conferencing packages. The camera can also be used to take still pictures or record 3D video for YouTube. It can also be used as a normal 2D Webcam. For display the camera makes use of the Hyundai W240S http://bit.ly/crMvx3 and JVC GD463D10U 3D http://bit.ly/9mruCo monitors already owned by the RCC.

For gaming engines the lab will be adding the Microsoft XNA Game Studio and additional XBOX technology. Microsoft XNA is a set of tools with a managed runtime environment that facilitates computer game development and management. XNA currently encompasses Microsoft's entire Game Development Sections, including the standard Xbox Development Kit and XNA Game Studio. http://bit.ly/bW0Uaq In addition an Xbox 360 Pro Console (60 gig) was obtained for this development. http://bit.ly/pqNEF

To improve communication for students doing online collaborative streaming production and research, the RCC will work to update the RCC's conference rooms for online collaborative communications. In the short term it has equipped its loaner computers with Skype technology and has provided MagicJacks so students can have basic telephony when making use of the rooms to record podcasts or when undertaking online presentations. Longer term the RCC is considering how it might introduce camera technology in the rooms to provide an improved environment for online presentations. http://bit.ly/cglwIP

Audio Production

For audio field recording the lab has obtained a number of devices. Amongst them are two Handy Zoom H4N audio recorders. Loaded with features and considered to be the best recording device for bloggers, the H4N's boasts high-resolution audio at 24bit/96kHz and record on SD/SDHC media of up to 32GB. The units connect to PC's through USB 2.0 and are considered one of the top interfaces for exporting quality sound from computers. http://bit.ly/cTod0X

Another interesting addition for audio recording added to the pool is TASCAM's DP-004 Digital Pocketstudio. This small device is a modern day "PortaStudio" and is smaller than a paperback book. The unit allows for four tracks of CD-quality digital recording onto SD media. It has two ¼" jack microphone inputs as well as one built in condenser mic, a display providing level indicators and employs traditional rotary knobs to adjust levels during recording. http://bit.ly/dpZMLA

To pickup audio in the manners required for the cluster a variety of microphones were added. To start MXL uChat AC-406 boundary microphones were obtained. They connect to a computer's USB port to provide a microphone and speaker for two-way conferencing over the internet via Skype™, AIM, iChat and other web conferencing software programs. The MXL uChat includes anelectromagnetic speaker, a headphone output and delivers high quality sound. http://bit.ly/cqj1iL

For individuals who'd rather employ a more traditional microphone for computer recording, the RCC is making available three Samson Q2U USB/XLR Microphone with HP20 Headphones. This kit contains a dynamic handheld microphone that features both an XLR output and a USB I/O. The mic can plug directly into any live sound console or any computer with a USB input. And the microphone's on/off switch allows for control the audio to the XLR output, allowing one to perform in a live setting and record to a computer simultaneously. The mic also features a built-in 3.5mm stereo headphone jack with volume control for no-latency monitoring during recording. The mic employs a cardioid pickup pattern and a high-quality A/D converter with a 16-bit, 48kHz sampling rate to ensure the sound reproduction in both live and recording applications is clear, detailed and accurate. It's also compatible with most computer based digital audio workstations. http://bit.ly/9tD6Wm

For multiperson conferencing over Skype the RCC has obtained IPEVO's Internet Conference Station X1-N6. The X1-N6 is USB plug and is compatible with all popular Internet communication applications, including Skype, Windows Live Messenger, Yahoo! Messenger, iChat, Google Talk, and AIM, as well as VoIP systems like Avaya solutions or Microsoft Office Communicator. The unit provides business-level sound quality employing a 16-bit digital signal processor (DSP) and sampling rate of 16KHz. The unit is also full duplex, allowing for echo cancellation and background noise filtering for natural, high-quality voice transmission and reception. This superior sound technology also allows for a voice range of 5 meters (about 5.4 yards). http://bit.ly/aD8C6w

Mobile Devices

The Mixed Reality production cluster is ground zero to FCAD's curriculum in Mobile technology. This year the lab has significantly increased its fleet of devices with additional investments in Nokia N900, http://bit.ly/bK6soH Apple iTouch 8GB handsets, http://bit.ly/bnmLZP Google Android Dev 2 phonesets, http://bit.ly/9y7u5I and budget to invest in Apple's iPad devices. http://bit.ly/bJgw8v To improve audio recording on the iTouch, Touch Microphones have been secured. http://bit.ly/xKJRl

Additional Devices Obtained For The Mixed Reality Production Cluster

To round out the package of technology investments that included the addition of twenty MacBook Pro laptops for classroom use and five additional loaner laptops, the day to day inventory used by students for the creation of installations was improved significantly. Other technologies obtained for the cluster include…

- Canon ZR960 firewire based camcorders. http://bit.ly/bWOWpX
- Chumby One and Chumby Classic devices. http://bit.ly/bOipJ6
- aGent V5 HD webcams that are compatible with both Apple Mac and PC. http://bit.ly/vqsBc
- Point 2 View USB Camera with a multi-jointed stand, handheld grip, and universal monitor clip for unlimited view options. http://bit.ly/6Yukja
- FREETALK® Everyman USB headsets. http://bit.ly/c20L0I
- QuickCam® Orbit AF motorized tracking webcams. http://bit.ly/16dPR
- Epihpan VGA to USB Capture Unit.s
- XLR to USB Audio Converters.
- Logitech Compact Speakers. (S125i) http://bit.ly/d3kf7q
- Elo 1715L Touchmonitor. http://bit.ly/b9wwlH
- Loanable Weller Solder Station/MultiMeter/Kits.
- Additional Arduino Duemilanove USB Microcontroller Modules.

Information on Ryerson's Mixed Reality Production Cluster including extensive documentation on its hardware and software can be found at http://www.rcc.ryerson.ca/technology/mixedrealitycluster.htm

More information on the Rogers Communications Centre, the shared FCAD facilities it operates and the specifics of the labs that encompass the Cluster can be found at http://www.rcc.ryerson.ca/technology/index.htm