



Extron AV Systems Facilitate Research at Leading Institute in India

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G.R. Malik
Director
AV Science and Technologies

The Institute of Genomics and Integrative Biology - IGIB is a premier institute of the Council of Scientific and Industrial Research – CSIR in India, and is involved in valuable research in genomics, molecular medicine, bioinformatics, proteomics, and environmental biotechnology. Eminent scientists in the field of biology from across the globe visit the institute regularly for international conferences, and to interact with IGIB scientists and students. IGIB wanted to equip several of its main presentation spaces with versatile AV systems that could accommodate a range of sources, support larger audiences across multiple rooms, and enable AV streaming capabilities across multiple campuses. To deliver these essential capabilities, integrator AV Science and Technologies - AVST worked with a local Extron team and IGIB to deploy powerful AV systems that combine a variety of Extron products including XTP Systems®, the Annotator, the SME 100 HD streaming media encoder, TouchLink®-based control systems, audio digital signal processors, amplifiers, and speakers.

AV Requirements and Challenges

IGIB wanted to upgrade its Mathura Road campus to enable teaching and information sharing within the institute, between campuses, and over the Internet through a media server. Plans called for flexible and user-friendly AV systems for delivering high resolution video presentations in three main spaces – a 200-seat auditorium primarily used for lectures, seminars, conferences, and occasional small-scale cultural programs; a 50-seat training room; and a 40-seat conference room. IGIB required that the training room and conference room AV systems share audio and video with the auditorium for overflow situations. The systems in the two smaller rooms also had to support local AV presentations when used for independent conferences or training.



Extron Electronics
INTERFACING, SWITCHING AND CONTROL



The XTP System provides flexible AV switching and distribution in the auditorium, allowing complete flexibility on which content will be shown on each of the display devices.

IGIB needed the audio systems in all three rooms to support multiple participants, conferencing applications, and quality reproduction of music and other program content. They also wanted two-way audio communication for Question and Answer sessions between the rooms on campus, and with the nearby Mall Road campus. The institute required AV streaming capabilities to multiple locations. IGIB wanted the ability to display video of the presenter, along with the presentation content and images of the audience, all on a single screen.

The existing building infrastructure and conduits did not include much provisioning for AV cabling. This limited the available space to pull cables for AV. Also, the various rooms were already occupied. As a result, IGIB needed a system that would reduce the amount of required cabling, as well as provide reliable video and audio signal transmission over long distances with minimal disruption to any current activities.

"This was one of our most comprehensive installations involving the latest digital products," says G.R. Malik, Director of AV Science and Technologies. "It was equally challenging to weave together the high end solution because the building's existing infrastructure limited space for AV cabling and the site was routinely in use." AVST had to install cable runs of up to 200 feet (60 meters) from the equipment rack in the control room to the sources and displays in the auditorium, conference room, and training room, and to a 2x3 videowall in the front lobby.

Integrated Annotation and XTP Distribution

AVST selected Extron XTP Systems to provide flexible and reliable AV switching and distribution for the auditorium, conference room, training

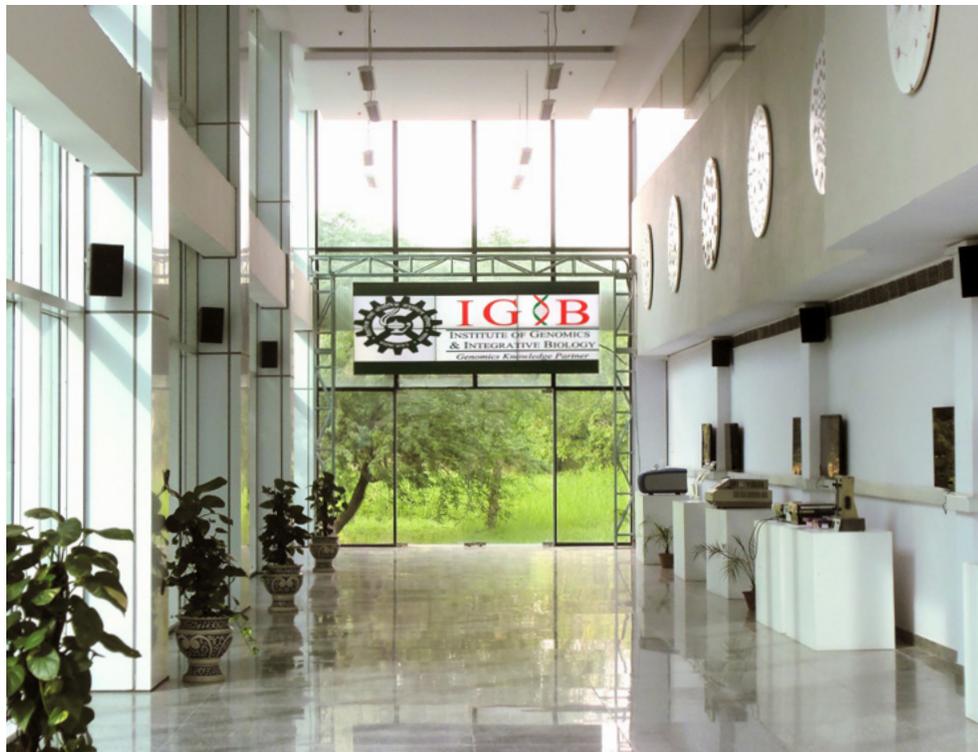
room, and lobby, as well as to simplify the cabling infrastructure. At the heart of the XTP System is an XTP CrossPoint® 1600 modular 16x16 matrix switcher in the control room. XTP transmitters and receivers in the presentation spaces each connect to the XTP matrix switcher over a single twisted pair cable to carry audio and high resolution video. This helped to streamline the installation. The XTP CrossPoint 1600 also remotely powers the transmitters and receivers over the same CATx cable, eliminating the need for local power at specific endpoints. Additionally, the matrix switcher sends RS-232 signals from the control system to the receivers over this cable, for controlling display devices.

Sources in the auditorium include a resident PC, guest laptops, a DVD player, and a document camera. Two high definition PTZ cameras capture different views of the presenter and audience for the AV streaming system. Lecturers display their AV presentation materials using a projector and two flat panel displays in the auditorium, while an AV technician monitors the captured content on an additional display in the control room. To accommodate much larger audiences, presenters can also show lecture material with a projector in the training room and conference room, a videowall in the lobby, and a display in the conference room that is primarily used during videoconferencing sessions. A PC in the control room provides additional digital signage material for the videowall.

In each room, XTP transmitters in the lectern accept AV source signals and send them up to 200 feet (60 meters) to the XTP CrossPoint 1600 matrix switcher in the control room. Fortunately the XTP System can send signals up to 330 feet (100 meters) if needed. The matrix switcher



The conference room is used for meeting overflow from the auditorium, and for local AV presentations.



A 2x3 videowall, consisting of 55-inch displays, enables students and others in the lobby to view lectures, seminars, conferences, or small-scale cultural programs that take place in the auditorium. Extron SI 26 speakers, now replaced by the SM 26, provide audio reinforcement of the auditorium programs for overflow audiences.

sends the AV and control signals to the XTP receivers above the projectors in the auditorium and training room, and behind the displays in the auditorium, conference room, and lobby. The XTP System delivers shared or independent content to each of these display devices, to cater to the combined needs of all the rooms.

"The XTP System serves as the heart of a complete, centralized AV system for the Mathura Road campus, and deploying the system was quick and easy," says G.R. Malik. "The ability to transmit AV and control signals across long distances with a single twisted pair cable greatly simplified installation, while AV functions as source switching and video collaboration are seamless and effortless."

For the auditorium, AVST chose the Extron Annotator with a second scaled output to provide presenters with annotation capabilities on any switched input source from the central XTP CrossPoint 1600. Using the Annotator installed in the control room, and a touch display connected via an Extron USB Extender, presenters can make notations to computer-video presentations. The many on-screen annotation tools make it easy to illustrate ideas and visually emphasize key topics. Presenters can also annotate over live video from the DVD player thanks to the high resolution, full motion video capabilities of the Annotator. They can preview these annotations before making them live through the main output for the audience.

The camera feeds and AV presentation from the auditorium route through the XTP CrossPoint 1600 to a DVS 605 Scaling Presentation Switcher, which scales the output and provides the content in picture-

in-picture format. An HDMI DA2 Distribution Amplifier distributes the DVS 605 output signal to a display in the control room and back through the matrix switcher. This enables the camera feeds and presentation content to be shown together on any of the display devices in the auditorium, training room, conference room, or lobby, or through the AV streaming system.

"We decided to go the digital route with the latest technology products for our new campus, and we are quite happy with the updated audiovisual infrastructure," says Dr. Debasis Dash, Principal Scientist at CSIR - Institute of Genomics and Integrative Biology. "These AV systems have helped us reach more students and scientists, as well as provide greater flexibility, thereby increasing the overall learning experience."

Convenient Streaming Capabilities

The AV streaming system includes an Extron SME 100 HD Streaming Media Encoder integrated with a Wowza® Media Server. The system is used to capture and distribute AV presentations as live streaming or recorded media that can be accessed from the network on-demand. The SME 100 HD accepts pro AV signals such as DVI, RGB, HDTV, and standard definition video with audio, and streams one source encoded at high quality to the media server. The media server provides high scalability for the system, delivering live streaming to many destinations. It also provides a transcoding function, offering use of many different streaming protocols that are required by different PCs and mobile devices. Additionally, the media server records the encoded content for on-demand use. AVST installed a similar system

at the Mall Road campus, enabling students at one campus to view presentations hosted at the other campus. These AV streaming capabilities also facilitate communication with various CSIR labs and other collaborating institutes.

High Performance Audio Systems

The audio systems in the presentation spaces consist of speech and program audio zones, using fixed and wireless microphones. AVST selected two Extron DMP 128 C P audio digital signal processors for the auditorium and an Extron DMP 128 C audio digital signal processor for the conference room, in conjunction with the Extron streaming and XTP products, to build a cohesive AV system that incorporates a wide range of capabilities. The DMP 128 C units provide essential audio functions including mixing and routing, microphone automixing, equalization, dynamics processing, and AEC – acoustic echo cancellation which prevents echo during conferences when multiple rooms are in use. The DMP 128 C P also includes analog phone interfacing for conferencing sessions. The audio system at the Mall Road campus auditorium is equipped with similar audio DSP products so that viewers at one campus can actively participate in the seminars at the other campus.

The DMP 128 units are installed in the control room and accept audio signals from microphones in the auditorium, wireless microphone receivers in the control room, and source audio from the XTP System. One of the DMP 128 units also accepts audio from an Extron DMP 64 audio digital signal processor in the training room's local AV system, and provides a processed audio signal for the auditorium's subwoofer and speakers. Both DMP 128 units are linked via their expansion ports, which allows audio to pass between them. Presenters can also route wireless microphone audio signals between the rooms when necessary. This facilitates Question and Answer sessions with the presenter in the auditorium. Audio from the DMP 128 C P is also sent to the SME 100 streaming media encoder. AVST used Extron DSP Configurator™ Software to configure signal routing, processing, AEC, and analog phone connections for the various DMP units.

The auditorium, conference room, and training room did not include proper acoustic treatments to account for the low ceilings and the large glass pane windows in between the auditorium and two adjacent rooms. It was a challenge to manage audio in a way that the rooms were not disturbed while multiple sessions ran simultaneously. The upgraded audio systems needed to provide a method for fine tuning audio signals in each room which, in conjunction with new acoustic treatments, would help improve audio quality and intelligibility.

AVST fine-tuned the audio signals processed through the DMP 128 and DMP 64 units using parametric EQ processing blocks in the DSP Configurator Software, to optimize the signal for the environment as well as improve the quality and intelligibility of program and speech material. Additional adjustments to the feedback suppressor blocks also help to prevent feedback in a "lively" room where there may be more reverberation and sound reflections.



A single equipment rack in the control room houses most of the AV equipment for the auditorium, conference room, and training room.

For amplifying voice and program audio content, AVST chose a range of ENERGY STAR® qualified Extron power amplifiers, including the Extron XPA 2004 four channel power amplifier for the auditorium. The XPA 2004 provides a total of 800 watts power output for Extron SI 28 surface mount speakers at the front of the room, and for SI 28W in-wall speakers mounted along the side walls. The Extron XPA 4002 two channel, 400 watts per channel, amplifier powers the subwoofer.

In the conference room, an Extron XPA 2002-70V two channel, 70 volt power amplifier provides 200 watts per channel for a distributed speaker system using Extron SI 26CT ceiling speakers. The sound reinforcement system in the training room includes an Extron XPA 2002-70V two channel, 200 watts per channel, power amplifier and several SI 26CT ceiling speakers. The SI 26CT speakers fulfill aesthetic needs and provide the necessary sound coverage in both rooms. The



Advanced DSP built into the DMP 128 and DMP 64 digital matrix processors was used extensively to improve audio quality and intelligibility in an acoustically challenging environment.

XTRA™ Series amplifiers provide ample power for the speaker zones, generate very little heat, and are housed in compact 1U enclosures that save valuable rack space, allowing AV equipment from the three rooms to fit in a single rack without the need for additional ventilation space or dedicated cooling.

User-Friendly TouchLink Control

In the control room, AVST chose the Extron TLP 1000TV 10" TouchLink Touchpanel and an Extron IPCP 505 IP Link® Control Processor. With the TLP 1000TV, a technician can easily operate the auditorium's AV system when assisting the presenter during a lecture. The touchpanel provides intuitive system operation, including source selection, the ability to power the displays on or off, and audio adjustments. An Extron TLP 710MV 7" Wall Mount TouchLink Touchpanel and a TLP 350MV 3.5" Wall Mount TouchLink Touchpanel, paired with IPL 250 IP Link Control Processors, simplify operation of the conference room and training room AV systems.

Results with Extron Flexibility and Scalability

Utilizing a powerful combination of Extron XTP, annotation, streaming, control, and audio products, the installed systems meet the institute's needs for flexibility and scalability. The extensive AV capabilities are particularly beneficial for major events that cater to a wider audience. This facility at Mathura Road has become the hub of seminars for IGIB, and is used more frequently by lecturers, visiting scientists, and students. The interactive AV solution enables students and scientists at the Mathura Road and Mall Road campuses to attend lectures without the need to travel.

"It makes me very happy to see the satisfied users of our institute's AV facility," says Raghu Nandan, Scientist at CSIR - Institute of Genomics and Integrative Biology. "It was a challenge to select the right technologies, products, and design for such an institution where the world's future biological researchers interact with eminent personalities across the world, and Extron helped us achieve this goal."

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