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Left image: Full view of Pablo Picasso, *Man with a Pipe* 1911. Oil on canvas. Kimbell Art Museum.
Center and right images: Details of work using spectral imaging.

Picture Perfect

Revolutionary Spectral Digital Technology Used to Reveal Secrets of Works of Art

Santa Barbara Museum of Art and MegaVision Bring ***Picasso and Braque*** Exhibition into Closer View

March 21, 2011 –It’s difficult to think about our everyday lives without the magic of digital image technology – no instant shots with infinitesimally small cameras, no editing of wrinkles, age spots, red-eye, and other unmentionables, and no posting on websites for the entertainment of family and friends. It is also mind-boggling to think that a mere 28 years ago marked the birth of the first digital visual device, and 20 years ago when digital cameras started hitting the hands of professional photographers, albeit still with a hefty price tag of nearly \$100,000.00. Only in the 1990s did consumers finally start to see more reasonably priced, user-friendly versions of the digital camera hit retail stores.

Besides the millions of consumers of digital camera technology, countless industries rely on the convenience, accuracy, editability, and easy archival/storage that digital imagery provides. Specifically, the museum and art worlds have followed the development of visual technology in order to document and archive priceless and fragile works, and to reproduce pieces for art enthusiasts to enjoy via website, exhibition catalogue, and other merchandise.

But not until recently has an art museum utilized the latest and most accurate digital visual technology of ***spectral imaging*** specifically to reproduce works for an exhibition catalogue and related programming. For the past year, the ***Santa Barbara Museum of Art*** has been working with Goleta, CA-based ***MegaVision*** to capture the “perfect picture” of some of the works in the upcoming and much anticipated exhibition ***Picasso and Braque The Cubist Experiment, 1910-1912***. Opening at the Kimbell Art Museum in Fort Worth, TX in May 2011, and at the Santa Barbara Museum of Art in September of the same year, this co-organized presentation features the works of paintings and prints by Georges Braque and Pablo Picasso during one of the most prolific and intensely experimental exchanges in the history of art. This is the first exhibition to dwell on a selection of the paintings, as well as nearly all of the prints produced during two critical years, to demonstrate the visual point and counterpoint that fed into the invention of the revolutionary art form now known as Analytic Cubism.



MegaVision MultiSpectral imaging System

The question is, then, how does the quality of spectral imaging surpass that of the professional photographer already armed with his or her Nikon dSLR? The answer lies within the camera itself and how visual digital technology actually works. A color digital image is normally captured electronically utilizing Red, Green, and Blue color filters in order to reproduce a broad array of colors. During its birth in the early 1980s, the technology was used in very specific fields, primarily military and medical industries. By the late 1980's MegaVision was engineering some of the first digital color cameras for use in high quality commercial color photography. The amount of information that was gathered in the form of millions of pixels required enormous computers to process the data. In 1994, the large mechanisms needed to store the digital data were replaced with much smaller processing chips, transforming a large, bulky piece of equipment to a more manageable size. To capture color pictures, however, the RGB filters still needed to be integrated into the camera. The resulting image has certainly been more than sufficient for the art-minded vacationer or even the high-end professional photographer.

Within the past few years, technology has progressed at a very rapid rate, especially in the area of LEDs (light emitting diodes). The power of LEDs has allowed the RGB filters to be removed from behind the lens and replaced with RGB light aimed directly onto the object that is being photographed. Because our eyes do not actually see colors in the same way that RGB cameras see colors, and because LEDs come in many different colors, more colors than just RGB can be used, resulting in much more accurate color images. And not only visible light is possible, but now there are options for ultraviolet and infrared which can reveal features invisible to human eyes. The elimination of the filters in the optical path allows for a higher quality image, greater accuracy of color, and most important in the art preservation world, a reduction of harmful light by a factor of 10-10,000---1000% and up.

The J. Paul Getty Museum, realizing that MegaVision's light-based spectral imaging could use very low levels of light on works such as watercolors and pastels that are vulnerable to light, yet achieve high accuracy and deep spectral content, digitized a number of works beginning in 2009 for discovery, archival, and recording purposes. In addition, the Library of Congress has pioneered the use of this technology since 2007 to digitize significant historical documents, such as the Gettysburg Address and the Declaration of Independence. But no museum has sought to spectrally image oil paintings, and in particular, high Cubist canvases for a special exhibition and its catalogue. The complex mark-making of so-called High Cubist or Analytical Cubist paintings is notoriously difficult to reproduce through conventional photography. The spectral images capture each brushstroke with astonishing fidelity, not only in terms of color but also texture. This is the first exhibition and catalogue to include these magnificent spectral images both for the enjoyment of the public and for scholars alike.

The ***Santa Barbara Museum of Art*** will be including spectral images of four of the paintings in the exhibition of the work of Georges Braque and Pablo Picasso for all visitors to see, both in the exhibition catalogue, as well as in the galleries. Forty iPads, featuring an app specifically designed for this exhibition to encourage sustained looking, will be available to exhibition visitors for use in the installation space. The app will also feature some of the spectral images, so that Museum patrons can experience the superhuman visibility made possible by spectral imaging. "We are not only capturing a larger image with more detail and texture," states Ken Boydston, President of MegaVision, "but also an image with more accurate color, and in some cases, hidden information in a work that cannot be detected by the human eye alone."

SMBA's Chief Curator Eik Kahng states, "I firmly believe that spectral imaging is the wave of the future for museum best practices. It not only captures a very faithful record of the conservation state of a work of art at a precise moment of its lifetime, which can thus function as a kind of baseline reference for the work of art's subsequent preservation; it also offers the possibility of new discoveries at the infrared and ultraviolet bandwidths. Essentially,

spectral imaging allows you to see underneath the uppermost paint layer, at times revealing changes made by the artist and hence, providing valuable clues to his or her artistic process. This virtue has already yielded remarkable results for the study of manuscripts and other archival, paper-based material. But what has not been widely understood is just how remarkable spectral imaging is when it comes to the textural complexity of oil paintings. The spectral images we will show of Picasso's and Braque's paintings allow you to see the trace of the very hairs of the brush in the paint layer. They can be truly mesmerizing. We are thrilled to have the opportunity to participate in the pioneering technology that has been developed by MegaVision. Ken Boydston is nothing short of a visionary, especially in his recognition of the potential of spectral imaging for the visual arts."

The Santa Barbara Museum of Art is a privately funded, not-for-profit institution that presents internationally recognized collections and exhibitions and a broad array of cultural and educational activities as well as travel opportunities around the world.

***Santa Barbara Museum of Art, 1130 State Street, Santa Barbara, CA.
Open Tuesday - Sunday 11 am to 5 pm. Closed Monday.
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