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FOR IMMEDIATE RELEASE

Sensable's Freeform Helps Egyptian Mummies Put Their Best Face Forward

New Exhibitions at Smithsonian's National Museum of Natural History, Spurlock Museum in Illinois Showcase Facial Reconstructions that Reveal Secrets of 2,000-Year Old Children

WILMINGTON, MA November 30, 2011 – Egyptian mummies have fascinated mankind for centuries, and now modern-day 3D design software is helping Egyptologists to better see what two small mummies looked like in life, and from that, advance their understanding of ancient cultures.

[Sensable](#) announced that its Freeform® 3D-modeling and organic design solution helped put a face on two high-profile Egyptian mummies in displays that just opened this month. The Smithsonian's National Museum of Natural History exhibition, "[External Life in Ancient Egypt](#)," displays [a new 3D-printed bust](#) of a Freeform-designed facial reconstruction performed from the computed tomography (CT) scans of a 3-year old mummified boy. The child is the subject of extensive research by noted physical/forensic Smithsonian anthropologist Dr. David Hunt. In a separate case with a mummy owned by the [Spurlock Museum](#) of the University of Illinois at Urbana-Champaign, Freeform helped reconstruct the face of an 8-year old child mummy, revealing greater detail on facial features, and even showing a small one-sided ponytail.

Facial reconstruction formerly required physically sculpting on casts taken from the skeletal remains, a painstaking, time-consuming process that is potentially destructive process to 2,000-year old mummies. Freeform allowed Joe Mullins, a Washington DC-based forensic artist, to work from new-era CT scans, input them into Freeform, and then with digital speed and accuracy, define precise layers of muscle, skin and soft tissue following skeletal lines to depict the children with startling realism.

"From Joe's facial reconstruction work, we learned our mummy was from West Asian or Middle Eastern heritage, and had more delicate facial features that we previously thought," said Dr. Sarah Wisseman, archaeologist at the [Illinois State Archaeological Survey](#) (ISAS, Prairie Research Institute), which collaborates with the Spurlock Museum on exhibits and interdisciplinary projects. Her 2003 book "The Virtual Mummy" detailed what is known about the Spurlock mummy based on a 1990's-era technology. "This is valuable new insight that confirms what is known about the mixed Mediterranean and Middle Eastern population inhabiting Egypt during the Roman Period."

[Freeform](#) is the 3D-modeling and design solution of choice for experts in facial reconstruction worldwide among archeologists and forensic artists at such institutions as the British Museum, Manchester University, the University of Dundee, the National Center for Missing and Exploited Children, and numerous law enforcement organizations. Freeform's rich set of organic modeling tools and unique 'digital clay' design paradigm, allow technicians to feel the model as they reconstruct and sculpt features

using clues from the scans and skulls – and to work faster and more iteratively, during reconstruction than if working in physical clay.

“With Freeform, I can see what the skull is telling me, to maintain a direct representation of the skull into the tissue so I can bring it to life,” said Joe Mullins, forensic artist and chairman of the forensic art subcommittee of the International Association for Identification, an industry group for forensic specialists. “If I were working in clay, I couldn’t see through to the bone. With Freeform, I can, and because it’s optimized for working with complex, organic shapes, I can work at amazing speed. I work in layers, adding muscles that I’ve taken from libraries of anatomies, tweaking them, and adding skin and refining facial features.”

“Best yet, I can save my work in stages, and make multiple variations – so that whenever I want to go back to a previous version, all I do is click.”

Since mummies’ heads often are damaged in death or over time, Freeform makes it fast and easy to mirror an intact section of the skull onto the damaged side, to create facial symmetry. After flattened or missing bone sections are corrected, Mullins refines the design of individual facial features, such as upper and lower lips and noses. Mullins uses standard guidelines for skin thickness by gender, race or age, but lets the bones serve as the foundation.

With one mummy, cranial analyses such as the measurements of the nasal aperture and space between the eyes determined the mummy to be of African descent and likely from near Luxor in Egypt. Based in this input, Freeform easily allowed Mullins to refine the look of the nostrils and the eyes.

“The eyelids require a lot of finesse, and that’s where Freeform’s sculptural advantage shines through,” Mullins said. As the industry’s only touch-enabled 3D design solution, Freeform users like Mullins sculpt by holding a touch-enabled (haptic) device instead of a computer mouse. For example Mullins established a reference point on screen, then simply pulled, tugged or smoothed out skin by “feel” as he moved across the underlying eye socket. “And if I didn’t like a variation I did – I simply went back to an earlier version. You can’t do that when working in clay,” he said. These digital files also are easily output in many forms of rapid prototyping additive manufacturing, allowing multiple copies to be made for display purposes or further analyzed.

With another mummy, by working in Freeform, Mullins had the tools to take the higher-resolution, more detailed CT scan, and correspondingly better define the design of the nose, lips, ears, and the eyes than in the previous 20-year old recreation made from clay. He also could work both from CT-indicated hair as well as historical images to design the small one-sided ponytail hairstyle.

“Even secrets of the grave are no longer so secret with today’s advanced technology,” said Joan Lockhart, vice president of marketing for Sensable. “We’re proud to showcase the facial reconstruction work of our Freeform customers, and are excited about the way it is helping to bring new insights to ancient civilizations – as well as helping solve forensic mysteries in the modern world.

The Smithsonian’s National Museum of Natural History “External Life of Ancient Egyptians” exhibition is permanent and includes an additional eight cases focusing on the science behind studying mummies. The museum is located at 10th Street and Constitution Avenue N.W. in Washington, D.C. and is open daily from 10 a.m. to 5:30 p.m. Admission is free. More information about the exhibition and the museum is available at www.mnh.si.edu, on Facebook, Twitter, Flickr and YouTube or by calling (202)

633-1000 (202) 633-1000, TTY (202) 633-5285.

The Spurlock Museum's mummy is on display on the museum's second floor. For more information visit <http://www.spurlock.uiuc.edu/>.

About Sensable

Founded in 1993, Sensable remains the leading developer of touch-enabled solutions and technology that allow users to not only see and hear an on-screen computer application, but to actually “feel” it. With 44 patents granted and over 10,000 systems installed worldwide, Sensable helps people innovate with human touch solutions. The company markets and sells the Intellifit™ Digital Restoration System for dental labs; a suite of 3D organic design solutions that includes its flagship product, Freeform; and the Phantom® and Omni™ lines of haptic devices, used in surgical simulation and planning, stroke rehabilitation, medical training, and a range of research and robotic applications. With an unparalleled commitment to partnering with customers, Sensable brings a human touch to innovating and implementing customer-centric solutions. Sensable products are [available through direct and reseller channels](#) worldwide. www.Sensable.com.

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