

Case Study – Reproducing an intricate Bronze Sculpture

The **Desert Snow** Training Program has provided the law enforcement community with the finest interdiction training available on the market since 1989. The **Black Asphalt** website has provided the law enforcement community with the most comprehensive networking tools available since 2004. Together, these companies have helped officers apprehend and remove thousands of major criminals from our streets and communities.

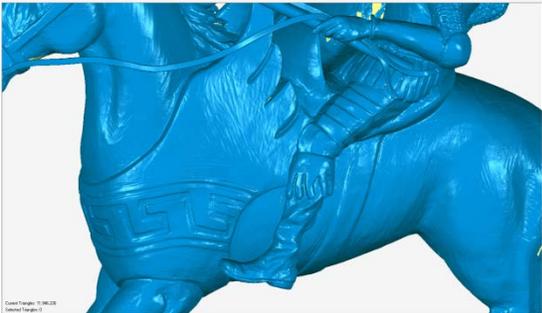
Desert Snow's distinguished history was represented by its Mascot, a horse riding knight going into battle. This unique hand made bronze sculpture epitomized the essence of Desert Snow.



Desert Snow honors many illustrious law enforcement officers during its annual conventions. Since this one-of-a-kind mascot represented the attributes of the work involved, it was decided to be presented to the most prominent officers during the annual ceremonies.

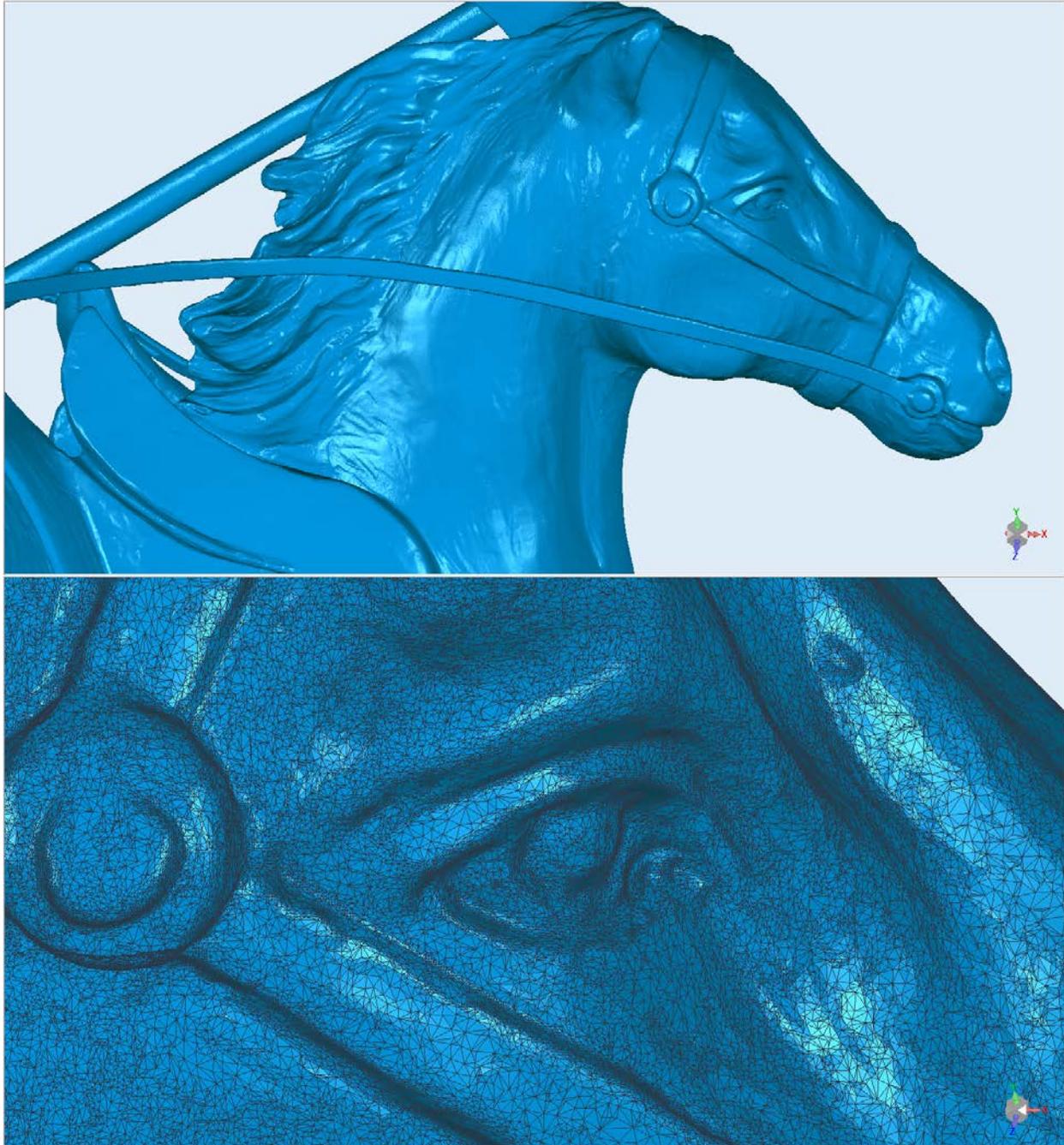
The problem was: This sculpture was one of a kind, and the award sculpture was going to be much smaller than the original. So, it was decided to reverse engineer this casting to make a new bronze cast for creating smaller multiple bronze copies of the original sculpture.

Applications 3D was contracted to provide the 3D scanning, reverse engineering and 3D printing services. The 3D scanning was done using Steinbichler Comet 5 white light scanning system. This high resolution digitizing machine facilitated the collection of tens of millions of highly accurate x,y,z points on the surface of the sculpture. These points were then meshed together into a triangular polygon model.



Since there was a lot of intricate detail in the sculpture, and some of the required areas were hidden from the scanner's access, the resulting polygon model needed to be digitally modeled.

This digital shape modeling was done in the state of the art Geomagic Studio© software. Geomagic is a leading provider of 3D software for creating digital models of physical objects for reverse engineering, product design, inspection and analysis. It's advanced tools, powerful interface, ease of use and potent automation technology makes Geomagic the industry leader in its class.



In Studio, the scanned polygon model was first optimized, decimating the points on the flatter areas, while keeping a larger number of points on the sharper, more featured areas. During this automatic process, other abnormalities in the data were also repaired, and the model was scaled down in size to the smaller required size. Any missing data was filled in using curvature continuity methods, so that the missing areas were represented as close to the original as possible. The resulting model was finally a watertight STL model!

The next step was the creation of an actual physical model that was going to be used as a pattern for making the bronze production cast of the sculpture. The challenge at this stage was to accurately build all the finer details in the model. This was done by using the finished STL model to 3D print a physical SLA model



This SLA model was then used by the bronze cast maker as a pattern to make the tool for producing the smaller sized sculptures for the award ceremony !

