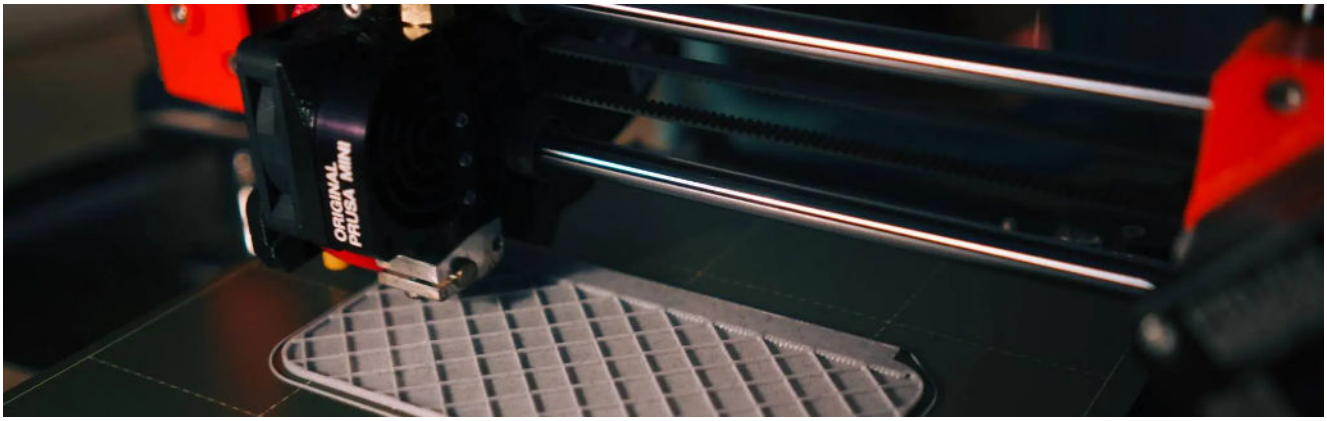

How to Utilize 3D Digitization to Empower 3D Printing

High-tech 3D printing is the process of producing objects from a digital model or a CAD model. Material is deposited, joined, or solidified under computer control, typically layer by layer, by adding material together under computer control.

It allows you to recreate any object you see regardless of its size, shape, and color. As one of the latest technologies in the world, it is expected to bring a new revolution to various industries, including machinery manufacturing.

With Scantech's high-precision 3D scanners product designers and engineers can create accurate and printable 3D models for objects both on small and large scales.

How do we utilize 3D digitization technology to empower the 3D printing industry?

Inspection of 3D-printed parts

3D printing requires high-end tech and strict quality control. As long as there's product manufacturing, quality inspection is required. Here, at Scantech, we offer mature solutions for automated batch inspections. The industrial-grade laser 3D scanner we use has a maximum accuracy of 0.025mm, which can meet the inspection requirements for most 3D-printed parts.

As we can see in the video, we can automatically generate a color map by scanning a 3D printed part with a 3D laser scanner and compare it with the original CAD model. In this way, we can tell if it is qualified or not at a glance. Besides, we can preset the comparison templates according to the inspection requirements to inspect items such as section deviation, center distance, contour, flatness, center coordinates, etc. Each part is automatically detected one by one according to the templates with the automatically generated inspection report.

This fast and comprehensive inspection method can be used in two aspects. One is to scan the finished 3D printed parts, compare them with the standard drawings, analyze the quality of 3D printed parts, evaluate the stability of the 3D printing, and generate an inspection report. It ensures end users provide high-quality 3D printed products.

The other one is to use it to detect and compare different parts in the same batch or different batches, analyze the stability of 3D printers, and assist in the research and development of 3D printers with more stable production performance.

Reverse Design and Smart Restoration

One of our partners adopts 3D laser scanning technology to offer customers smart laser automatic repair solutions. The pictures below show us how to obtain 3D data of unrepaired parts by a 3D laser scanner, reversely acquire high-precision 3D models of the damaged parts by third-party design software, and automatically restore the parts by programming and path planning. The integration of the two technologies can help the manufacturing industry perform better.

Medical Rehabilitation

In the medical field, customized braces designed for the patient's pathological characteristics is required for treatment because of differences between patients and the complex structure of the human body. The emerging 3D technology, due to its features of custom-made and high precision, can easily solve the contradiction between the need for customization and the scale of production. The combination of 3D scanning and 3D printing technology can better help doctors achieve personalized and precise treatment for the benefit of patients!

Let's take a look at the case study: Spinal Orthopedics

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Let's take a look at the case study: Spinal Orthopedics

One of our partners, Shanghai TPM3D, customized spinal orthopedic braces for patients through iReal 3D non-contact scanning and nylon 3D printing technology. It takes less time to produce a customized brace which is more lightweight and breathable. Also, the brace is waterproof and antibacterial, suitable for long-term wearing. Compared to plaster brace, it is more comfortable to wear this brace without compromising the orthopedic effect.

Art and Design

In art and design, 3D scanning technology can help designers obtain the prototype data for engraving. Then, through 3D printing, it can proceed to mass production or derivative production. The combination of these two technologies has a wide range of applications in this field.

For example, we cooperated with Shanghai UnionTech to jointly help Lu Renjie recreate an ancient Chinese mythological world: "Classic of Mountains and Seas". Since the clay sculpture is not easy to preserve for a long time, to ensure a better exhibition effect, we used 3D scanning and 3D printing to help create 809 exquisite exhibits. We overcame the challenges posed by traditional methods and help our customer to vividly present the fantasy world of the artwork.

What is more, the data obtained by the high-precision laser scanner can be used for multi-process manufacturing (such as engraving, CNC, etc.), and then according to different requirements, the corresponding process can be selected to produce derivative works of different sizes, which can be strong support for the IP of the Classic of Mountains and Seas in the form of multiple business conditions.

Car Modification

Driven by young consumers, the automotive industry is accelerating into the era of personalization, and a huge “personalized automotive aftermarket” has been derived.

3D scanning can help customize your car such as rear wing installation, wide-body modification, interior modification, exhaust pipe modification, etc.). You can accurately obtain the data of a part and customize it in the way you like. 3D scanning and 3D printing can help improve and you want by redesign. With the support of data and 3D printing technology, it is possible to quickly upgrade and optimize auto parts, which is faster and more convenient.

3D Reproduction of Cultural Relics

The Kuenboya Institute of Intelligent Manufacturing and SCANTECH 3D carried out high-precision 3D scanning of the unearthed cultural relics at the Yecheng Museum in Handan, Hebei, and archived the high-precision data to facilitate the later research and restoration of cultural relics.

Through 3D printing technology, the 1:1 simulated cultural relics are copied for exhibition, which avoids irreparable damage to the authentic cultural relics during transportation and exhibition. Under the condition of ensuring the safety of the cultural relics, the general public can enjoy the exquisite cultural relics closely.

Paleontological Reproduction

In 2021, in Lufeng, Yunnan, SCANTECH participated in the whole process of “digital collection and restoration of dinosaur fossils.” Through high-precision tracking laser 3D scanning, the texture features and 3D data of newly unearthed dinosaur fossils were accurately obtained. Then the post-processing software was used for 3D model reconstruction, and then 3D printing to restore the dinosaur structure, and thus deducing the morphological evolution of Lufengosaurus 200 million years ago.

Through 3D scanning, all the details can be truly restored, and even the tiny fossil cracks as well. At the same time, the latest high-strength photosensitive resin was used as the printing material, which was used later for scientific exhibitions.

After the 3D scanning and 3D printing are completed, apart from being able to understand the appearance of the dinosaurs more directly based on the printed products, scientists can also obtain more information from the accurate data, do related research, and follow up on how the dinosaur lived, its relationship with contemporary dinosaurs and the living environment at that time, etc.

Through 3D technology, the scientific research personnel found the key to the door of time and space and opened a unique science trip for us to explore the meaning of the information left by life on earth 200 million years ago so that we can perceive the biodiversity.

Conclusion

SCANTECH uses 3D digitization technology to empower 3D printing, intelligently create everything and so much more.

We will continue to explore more applications and cooperate with more 3D printing companies to solve the challenges that neither of us can solve separately in the 3D digitization process, provide customers with more comprehensive 3D digitization solutions, help 3D printing technology be better applied in specific applications, and bring customers from all kinds of industries to enjoy the convenience and progress brought by 3D technology.