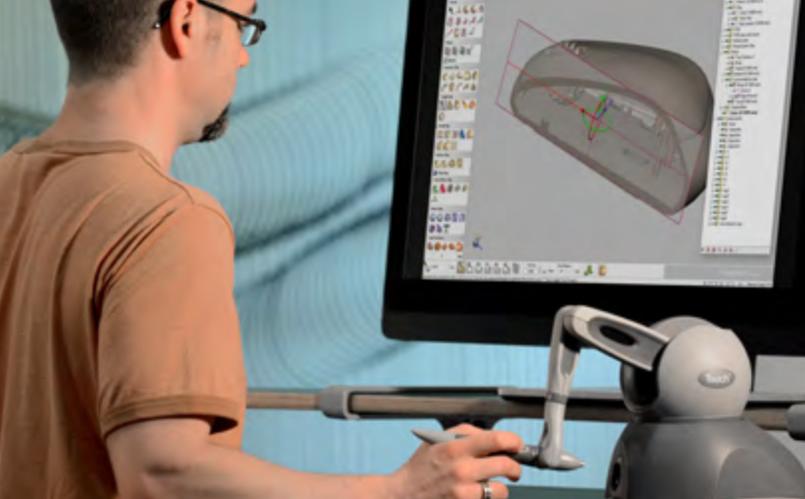


触觉式力反馈设备

为您的数字世界增添触感





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3D Systems 触觉式力反馈设备提供真实的三维导航和力反馈，将触感融入到Geomagic Freeform®和Geomagic® Sculpt™三维建模软件解决方案以及研究和商业应用中。3D Systems的触觉设备可以准确测量手持触控笔的三维空间位置（沿x、y和z轴）和方向（滚动、俯仰和偏航）。这意味着用户可以通过操纵这些设备来在虚拟环境中进行自由的三维操作，并且能够感受到与实际物体互动时的力度反馈。这种触觉技术在设计、建模、仿真和其他领域中具有广泛的应用，为用户提供更加身临其境的体验和更高的操作精度。

直观交互

当触觉式力反馈设备用在Geomagic设计和虚拟雕刻环境中，设计师能与3D模型互动，并感知模型，就像在物理粘土上设计一样。交互式的粘土雕刻工具就像在真实世界雕刻一样，使三维设计更加直观。当光标与虚拟空间的三维模型交互时，3D Systems获得专利的触觉式力反馈设备巧妙使用电机产生动力，推动设计师的手去模拟触感。3D Systems力反馈设备能根据模型提供3个自由度（DOF）或6个自由度（DOF）的力反馈。

通过触觉创建和模拟

3D Systems触觉式力反馈设备应用在需要精确有机设计的各个行业，用触觉感知来创建设计速度更快，并保证精准度。

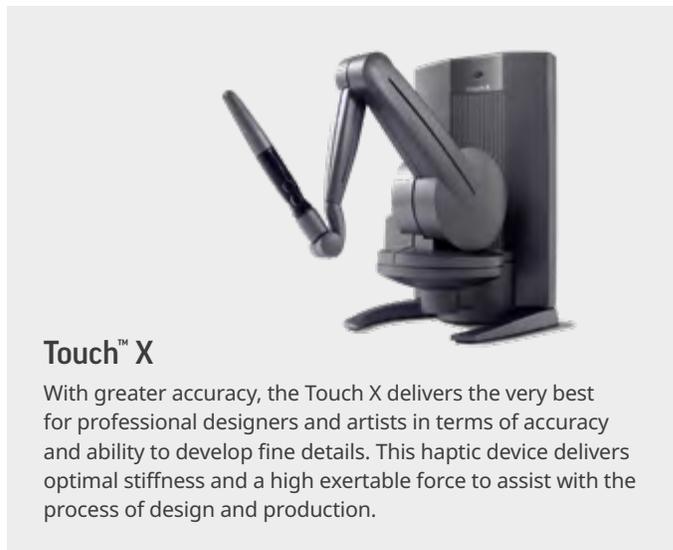
这些行业的设计师们转用Geomagic软件和触觉式力反馈设备完成更棒的作品：

- 3D Modeling and Manufacturing
- Jewelry, Automotive, Toy, and Shoe Design
- Medical Surgery and Rehabilitation Simulations
- Artwork and Sculpting
- Forensic Reconstruction
- Training, Simulations, and Skills Assessment
- Gaming, Entertainment, and Virtual Reality
- Bakewear and Cookery Molds and Dies
- Teleoperation and Robotic Control
- Virtual Assembly and Collision Detection
- Applications for the Visually Impaired
- Molecular Modeling
- Nano Manipulation



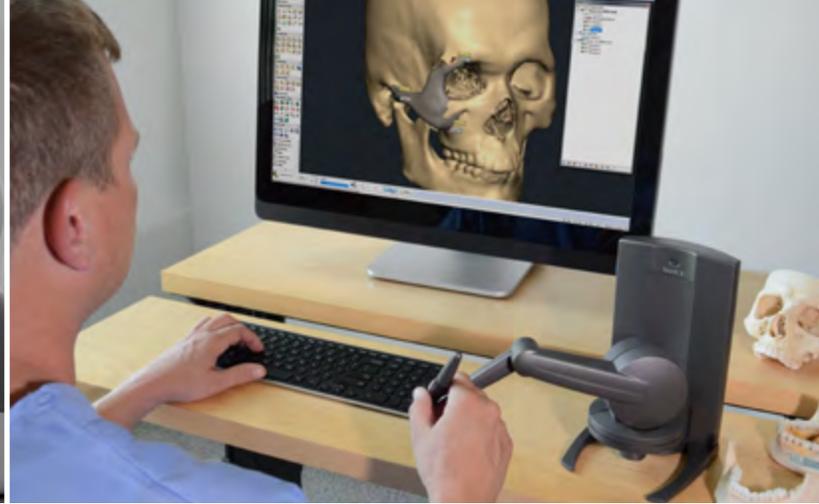
Touch™

The 3D Systems Touch offers the ability to precisely sculpt inside the Geomagic organic design software solutions. This haptic device offers robustness and stability for complex projects and designs.



Touch™ X

With greater accuracy, the Touch X delivers the very best for professional designers and artists in terms of accuracy and ability to develop fine details. This haptic device delivers optimal stiffness and a high exertable force to assist with the process of design and production.



Haptic Based Software

Ff Geomagic Freeform®

The industry's most comprehensive organic 3D engineering tools combine touch-based 3D sculpting, surfacing, design intent modeling, 3D scan processing, CAD interoperability and mold making. These features enable the creation of complex, sculptural, production-ready 3D models and quickly prepare them for additive or subtractive manufacturing. The software comes in 2 packages - Geomagic Freeform and Geomagic Freeform Plus and works exclusively with any 3D systems haptic device.

Sc Geomagic® Sculpt™

Geomagic Sculpt is an entry-level, fast, accurate virtual sculpting software platform that enables the creation of free-flowing organic designs for products, sculptures, jewelry and artwork that can simply not be achieved in CAD. Geomagic Sculpt operates with both a standard mouse or with a 3D Systems haptic device for a true sense of touch, while working as the most intuitive way to create functional and beautiful products for 3D printing and manufacturing.

OpenHaptics™

3D Systems OpenHaptics™ Software toolkit

From 3D game developers to molecular researchers, developing a new software product with a sense of touch is made straightforward with the 3D Systems haptic devices plus the OpenHaptics™ Software toolkit. This toolkit delivers the ability to integrate any 3D Systems haptic device into a 3D application with tools such as 3D navigation, material properties, polygonal object support, device control, sensor readings and more.



Haptic Devices

Add the sense of Touch to your digital world



SPECIFICATIONS	TOUCH™	TOUCH™ X
Force Feedback Workspace	~ 17 W x 13.7 H x 6.5 D in > 431 W x 348 H x 165 D mm	~ 14 W x 9 H x 7.1 D in > 355 W x 228 H x 180 D mm
Footprint (physical area the base of the device occupies on a surface)	~ 6 5/8 W x 8 D in ~ 168 W x 203 D mm	~ 6 5/8 W x 7 1/4 D in ~ 168 W x 184 D mm
Weight (device only)	3 lbs 15 oz ~1.42 kg	7 lbs 3 oz ~3.26 kg
Range of Motion	Hand movement pivoting at wrist	
Nominal Position Resolution	> 450 dpi ~0.055 mm	> 1100 dpi ~0.023 mm
Backdrive Friction	< 1 oz < 0.26 N	< 0.23 oz < 0.06 N
Maximum Exertable Force (at nominal orthogonal arms position)	.75 lbf 3.3 N	1.8 lbf 7.9 N
Continuous Exertable Force (24 hrs)	> 0.2 lbf > .88 N	> 0.4 lbf > 1.75 N
Stiffness	X axis > 7.3 lbs./in / > 1.26 N/mm Y axis > 13.4 lbs./in / > 2.31 N/mm Z axis > 5.9 lbs./in / > 1.02 N/mm	X axis > 10.8 lbs./in / > 1.86 N/mm Y axis > 13.6 lbs./in / > 2.35 N/mm Z axis > 8.6 lbs./in / > 1.48 N/mm
Inertia (apparent mass at tip)	~ 0.101 lbm ~ 45 g	~ 0.077 lbm ~ 35 g
Servoloop rate	1 KHz	up to 4 KHz
Force Feedback	X, Y, Z	
Position Sensing	X, Y, Z (digital encoders)	
Stylus gimbal	Pitch, roll, yaw ($\pm 5\%$ linearity potentiometers)	Pitch, roll, yaw (Magnetic absolute position sensor, 14-bit precision.)
OpenHaptics™ SDK, Unreal®, Unity® compatibility	Yes	
Interface	USB 2.0 / 3.0 port or USB Hub that supports USB 2.0/ 3.0.	
Power	110V-240V	
	18V Supply	24V Supply

3D Systems provides comprehensive 3D products and services, including 3D printers, print materials, on-demand parts services and digital design tools. Its ecosystem supports advanced applications from the product design shop to the factory floor to the operating room. As the originator of 3D printing and a shaper of future 3D solutions, 3D Systems has spent its 30 year history enabling professionals and companies to optimize their designs, transform their workflows, bring innovative products to market and drive new business models. Specifications subject to change without notice. 3D Systems, Geomagic and the 3D Systems Logo are trademarks of 3D Systems, Inc. All other trademarks are the property of their respective owners.

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