

ONE DAY WORKSHOP ON 3D SCANNING FOR VIRTUAL PROTOTYPE



25th November, 2024

A one-day Workshop on 3D Scanning for Virtual Prototype was conducted by Centre for Excellence in Robotics & Advanced Manufacturing, Department of Mechanical Engineering IcfaiTech, Faculty of Science & Technology, IFHE (Deemed-to-be University, Hyderabad on 25th November, 2025. There were 126 participants who registered for the workshop. The participants were from different disciplines like Mechanical Engineering, Civil Engineering, Electronics and Communication Engineering Computer science, Data science and Mathematics.

The recent one-day workshop centered on 3D Scanning Technology, offered an extensive insight into the field, particularly emphasizing hands-on experience in the 3D Laser Scanning. 3D Scanning is a non- contact, non- destructive technology that digitally captures the shape of physical objects using a line of laser light. 3D laser scanners create "point clouds" of data from the surface of an object. In other words, 3D laser scanning is a way to capture a physical object's exact size and shape into the computer world as a digital 3- dimensional representation. 3D laser scanners measure fine details and capture free-form shapes to quickly generate highly accurate point clouds.

This workshop was primarily targeted for the beginners and the intermediate enthusiasts who uses it a gateway to understand the pragmatic and technical facets of 3D scanning. In this workshop given hands-on experience to all interested participants for capturing their body virtual model using 3D scanning.

Inaugural Session

The program was inaugurated by lighting the lamp in the august presence of the dignitaries, Dr.K. L. Narayana, Director-Faculty of Science and Technology, IFHE Hyderabad; Chief Guest Mr. Yogendra Srivastava- founded VSD-3D, Hyderabad; Department Coordinator, Dr. Barla Madhavi;Associate Dean – Academics Dr. Suresh Kumar G and Workshop coordinator – Dr . A. Manmadha chary.



Inaugural address was delivered by Initiated with an introductory address by Dr. K L Narayana – Director gave the inaugural address of the session which set forth the workshop's goals and anticipated outcomes. He delivered importance of 3D scanning and how the data is captured using Coordinate Measuring Machine (CMM) instead of 3D Scanning. A traditional tactile CMM collects measurements where the probe touches the object's surface. The system calculates the coordinates of the point with reference to a 3-dimensional axis system. As more measurements are captured point by point, the software can build up a picture of the part. Also shared his experience on 3D Scanning and various research projects are solved by various IITs in India.

Chief Guest: Mr. Yogendra Srivastava - founded VSD-3D



The workshop was graced by the presence of Mr. Yogendra Srivastava - founded VSD-3D, Hyderabad. A distinguished personality in 3D Printing and 3D Scanning, Mr. Yogendra participation as the chief guest underscored the workshop's significance in the evolving sphere of technology. He explained about significant importance of 3D Scanning in various fields like Mechanical Engineering, Civil Engineering, Architecture, Archaeology, medical and Fashion Design. He explained future of 3D scanning in automobile industry.

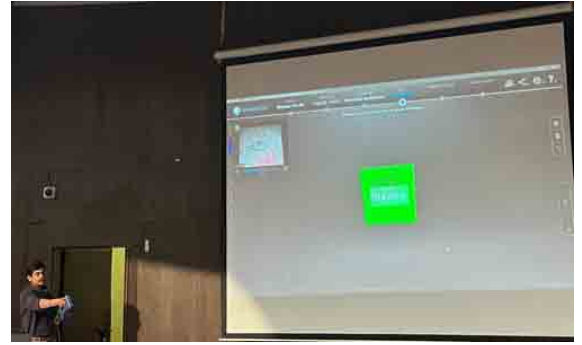
The inaugural session was followed by a compelling keynote from Mr. Yogendra, highlighting the pivotal role of 3D Scanning technologies in modern industrial applications. He explained the various projects solved by 3D Scanning and fabricating of sophisticated products, maximize materials saving, and customize products while benefitting from low costs.



He explained about different machines and methods exist to 3D scan objects like Laser 3D scanning, Photogrammetry and Structured Light Scanning. He explained on selection of the best 3D scanners for various applications. The Director felicitated him after his vivid and enriching presentation about the 3D printing.



In this workshop, VSD-3D team take the 3D scanning of a roller bearing as an example to explain basic facts and different techniques for the preparation, process, and post-processing of 3D scanning.



After the 3D scan, some parts of the scan have errors, like edges, points etc. which are not scanned. The expertise VSD-3D team explained how to rectify the errors by Geomagic software. They removed these 'noise' points from the point cloud with a few clicks. Finally, the scan data can be meshed into a 3D model and exported to common output polygon format as STL. After a lunch break, the live demo on capturing of some product development processes RE (Reverse Engineering) allows to generate surface models by 3D-scanning technique, and consequently this methodology permits to manufacture different parts and tools in a short development period. 3D Scanning capturing of human texture was given by the Technical Engineer Mr. Selvem from VSD-3D, Hyderabad. It created a great enthusiasm among the students to start working on the 3D Scanning. The scanning was explained elaborately which would be helpful for the beginners. Color 3D Scanner is used to capture the virtual model of Director Sir. After the demo, we involved students to participate.



This 3D scanner captures realistic textures, particularly for human bodies, without the need for markers. Colored 3D data that captures intricate details, providing a holistic approach to creating 3D models with precision in texture, size, and geometry. It enables quick texture capture and geometry acquisition, making it ideal for various applications in digital modelling and design. The VSD-3D team capture the objects which normally be scanned using laser-scanning. In this context data are usually initially available in termed "point cloud" form, meaning an unconnected set of points representing the object surfaces. These points need to be connected together using Geomagic. This is also used to combine point clouds from different scans and to perform other functions like hole-filling and smoothing. 3D Printing can be used to reproduce the articles that were scanned, which essentially would form a kind of 3D facsimile (3D Fax) process.

Hands-on Session

The Hands-on session started with participant's students, almost 20 pair of students learned scanning technique and data processing from point cloud data to STL file. The students practiced as, one person sitting in the chair and another person capturing the 3D data using 3d scanner. The data is also processed to all the students with help of technical team of VSD-3D. 3D scanning is the process of analyzing a person to collect data. A 3D scanning machine, or 3D scanner will collect the shape and possibly appearance (like the color) of the person. This data can then be used to get a 3D model, meaning a digital and three-dimensional object.

Valedictory Session

Finally, the students enjoyed learning techniques of the 3D scanning and developed a virtual models of minicheres. Workshop Coordinator Dr. A. Manmadha Chary gave his concluding remarks in the valedictory session by addressing the students and explaining the importance of the 3D printing and Workshop followed by Feedback and distribution of participation certificates to the students.

Distribution of Certificates for the participants:

