ABSTRACTS

GelSight is a 3D surface imaging technology based on an elastomeric sensor that enables high-resolution surface metrology and compliant tactile sensing. Using controlled illumination and advanced computer vision techniques, GelSight can transform multiple 2D images into a detailed 3D surface within seconds.

A painted membrane on the gel closely conforms with any surface it touches. Then multiple images of the surface with different lighting conditions are taken in a very short time from a single high-resolution digital camera. A 3D reconstruction algorithm generates a height map allowing precise measurement of surface shapes regardless of the optical properties of the material.

Based on these concepts, GelSight, Inc. has developed a portable high-resolution 3D measurement system that can quantify surface geometry down to one micrometer on any rigid material, including metals, composites, plastics, glass, fabric, and leather. The system can be taken to the factory floor or in a maintenance facility for in-situ measurements on aerospace components.

Working with researchers in the aerospace industry, GelSight, Inc. has developed streamlined algorithms of interest to the NDT community, including automatic measurement of the deepest point of a scratch, hole diameter and circularity, and fastener flushness. The GelSight Mobile system also has basic measurements such as gap widths, offsets, Z height profiles, radius of curvature and roughness. The system provides detailed digital information that can easily be integrated in advanced manufacturing organizations or in advanced on-line maintenance management services. For more advanced applications, the system can export data under formats readable by commercial analysis and metrology software.

GelSight systems are currently deployed in various industries such as aerospace, automotive, energy and many others.

KEYWORDS

3d scanner | surface topography | tactile sensing |