

GelSight – Enabling 3D Measurement for Shot-Peened Surface Characterization

GELSIGHT, INC. is a startup commercializing a unique imaging technology invented at MIT. The technology uses an elastomeric pad that conforms to any surface and enables 3D measurement of precise surface topography. Dr. Kimo Johnson, co-founder of the company and co-inventor of the technology, spoke with our team to explain how measurements of 3D surface topography can be used for shot-peened surface characterization.

What was the concept or challenge that led to the founding of GelSight?

Johnson: The driving concept behind the technology was to turn tactile interaction into an image. Our soft elastomeric pad is similar to human skin in that it deforms when it presses against objects. The early research on the technology demonstrated that it could be used to measure detailed 3D surface geometry of any material, which has broad applications across many industries.

What are the main application areas for GelSight's technology?

Johnson: GelSight technology is primarily used for non-destructive inspection in aerospace and automotive



GelSight Mobile System

industries but can be utilized across many others where precise measurement is required. The technology has been developed into a handheld tool that can quickly measure 3D surfaces and provide critical dimensional information such as the depth of a scratch, the diameter of a hole, or the angle of a chamfer. GelSight systems are actively used for quality control applications, mass production inspection, and both academic and industrial research.

What makes it relevant to the shot peening industry?

Johnson: As you and your audience know, shot peening is a process of altering the surface of an object to change its mechanical properties. The ability to quickly measure the shot peening process on the component itself, rather than by viewing an Almen strip, can provide a more accurate assessment of shot peening coverage, rate, and other process parameters.

What are the benefits of your technology over others in the market?

Johnson: The unique property of our technology is the elastomeric pad that enables precise surface measurements of any material, independent of the material's reflective properties. Many other technologies struggle to accurately measure reflective metals or require significant training to configure the system parameters for the material being measured. The GelSight measurement probe has a single button, similar to a camera, and touchscreen software that can be used effectively with little training.

What kind of surfaces does GelSight work on?

Johnson: The GelSight system can be used on any rigid surface, including glass, metals and composites. For deformable materials, it is possible to use a softer elastomeric pad to reduce deformation of the material during measurement.

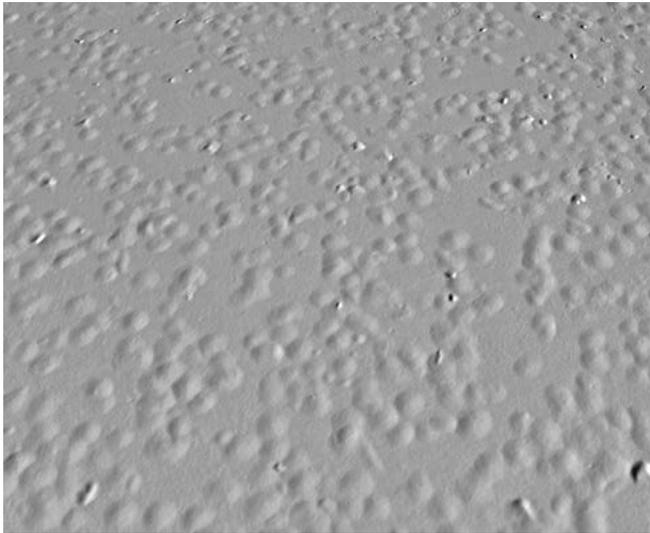
What are you working on today that you are most excited about?

Johnson: We are deploying measurement systems into different industries and finding new opportunities where the technology can provide value. The company is also developing

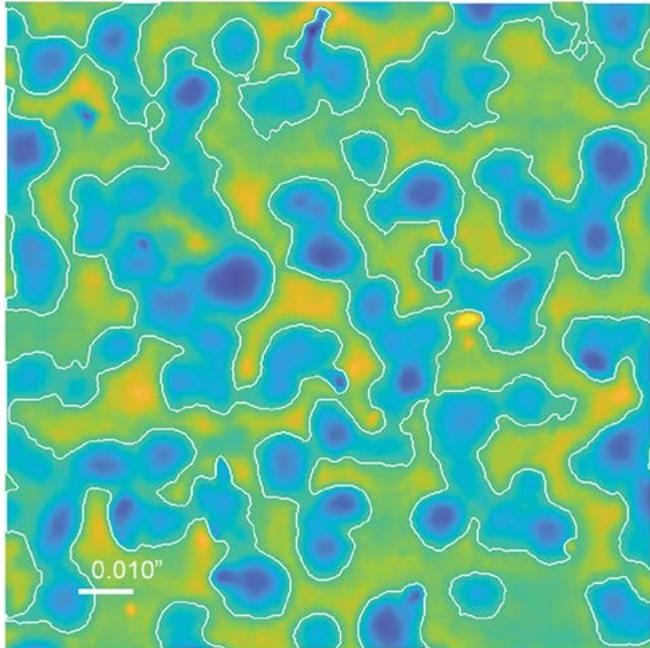
smaller sensors where the goal is to provide immediate tactile feedback to robots.

Where can readers go for more information? Resources?

Johnson: Readers can find more information about our company and technology on our website, www.gelsight.com, where they will also find a white paper on shot-peened surface characterization. There are also short demonstration videos about the technology on YouTube. ●



Rendering of 3D measurement of shot-peened Almen strip
Coverage 53%



Shot peening coverage analysis
Almen strip, peened with S390 shot at 60 psi, 7 revolutions
Dents in surface are automatically detected and measured



**Robotic/CNC
Shot Peening Equipment**

**Portable/Mobile
Systems**

**Complete Turn Key
Process including
Programming, Fixture
Design, and
Documentation**

**Patent Pending
Almen Fixture Design**

**EI Distributor for
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