2-D photos spring to 3-D life

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You're interested in purchasing a car you've seen on the web. It's the right make, model and vintage. It seems to be in great shape, and it's just the right color. The price seems reasonable. So what's the problem?

The problem, of course, is what's on the side away from the camera. Is it just as pristine, or is it a mess of door dings with an unmatched fender?

The solution is simple. Spin the image around on your PC screen and take a look.

Sound impossible? That's because you haven't seen the D.C. TechFair 2011 demo 3-D Scanning with a Regular Camera. Demonstrated today by Sudipta Sinha, a researcher who helped devise the project with his Interactive Visual Media colleagues Johannes Kopf, Rick Szeliski, Eric Stollnitz, and Matt Uyttendaele at Microsoft Research Redmond, the research project enables the creation of a 3-D image from a modest collection of ordinary photographs, the kind commonly acquired these days by anybody with a point-and-shoot camera or a mobile phone.

"Suppose you see something interesting and you want to capture different views of an object from different angles," Sinha says. "You take these pictures from different viewpoints, send them to our system, and it automatically figures out a 3-D model by measuring the 3-D depth behind the pixels in the images. Once you have that, you can interactively, seamlessly change the view from one camera location to another, and this allows the object to be viewed interactively in 3-D."

Once you have that, your prospective car seller can mark this one sold.

Sinha shows just such a demo, constructed from a mere 48 photos. Some people click off that many in minutes. The photos get transferred to a PC and uploaded to the cloud. A processing pipeline then matches similar images and learns how the camera moved in 3-D, enabling the creation of a depth map, not dissimilar from the depth data provided by the Kinect for Xbox 360 sensor.

The depth data gets stored, in a compact format, and is then viewable on virtually any screen you prefer: phone, laptop, desktop—you name it. Standard computer-graphics technology enables the viewing. It could even run inside a browser as a Silverlight app.

The potential for such technology seems endless. Yes, e-commerce and retail scenarios seem immediately obvious, but uses in tourism or education aren't far behind.

As Sinha says, "This is an enabling technology that makes lots of applications possible."

Admit it: You want this already, don't you?

Provided by Microsoft Corporation

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