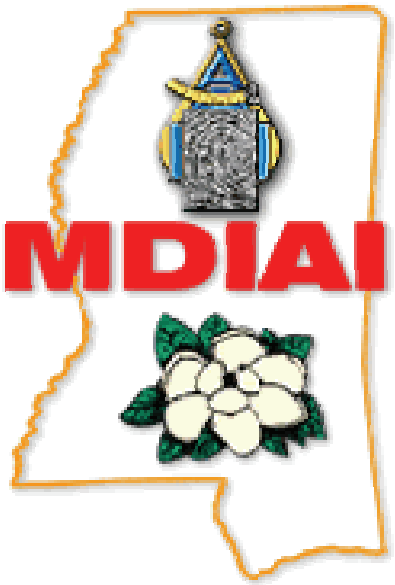

The Magnolia Print

Volume 33 2010 Number 2

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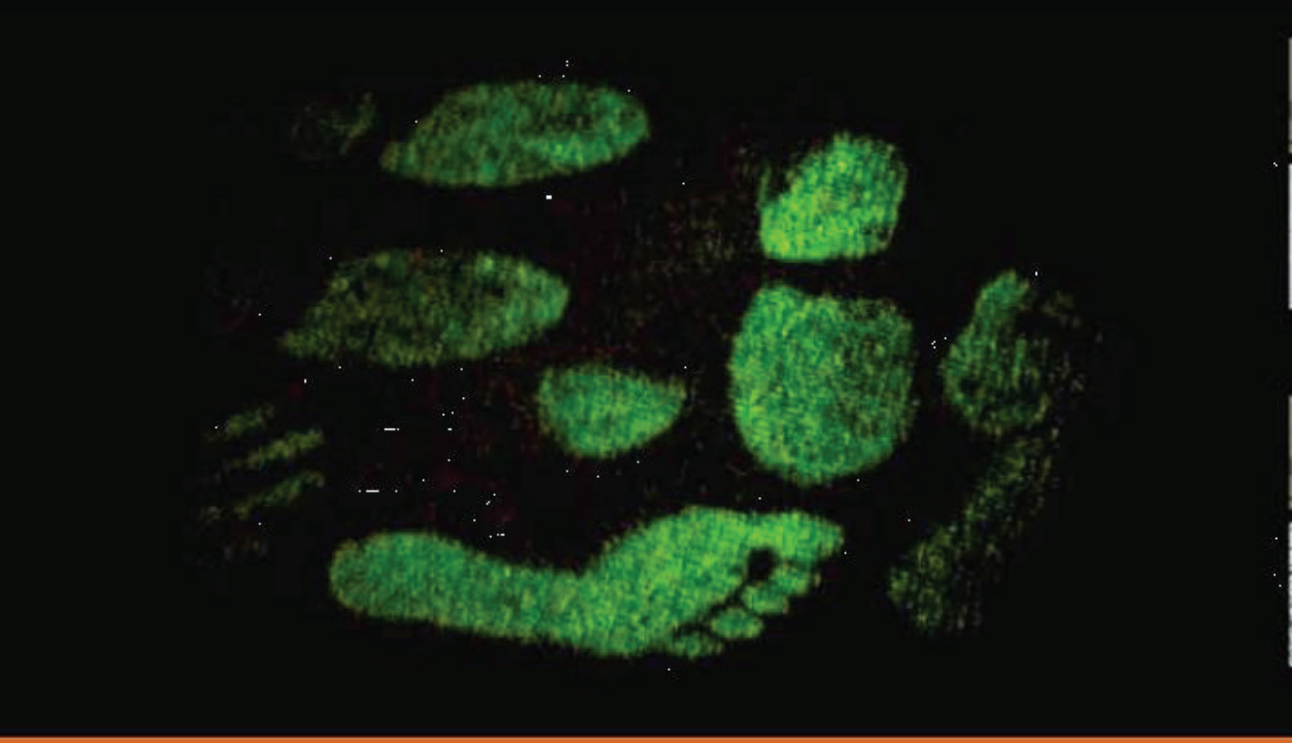

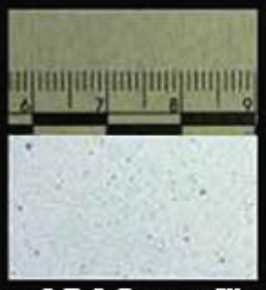

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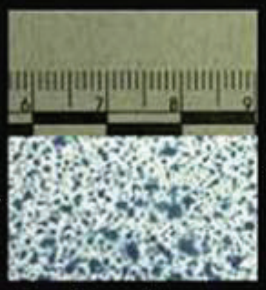

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The following article was obtained from ScienceDaily, Science Video
http://www.sciencedaily.com/videos/2008/1202-where_in_the_world.htm
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Computer Scientists Develop Program To Decipher Location of Photograph

1 December 2008
Optical Society of America contributing

To solve the problem of telling where in the world a picture was taken, computer scientists at Carnegie Mellon University in Pittsburg, PA have designed a [Global Positioning System] program that can fully analyze a photograph. A picture is uploaded into the computer, the computer scans the scene and makes note of color, texture and lines. It uses these elements to compare the image to over six million tagged images of locations on the digital-image-sharing website Flickr.

After testing the program on 200 photos, computer scientists confirmed that the program does well on geographic locations with a unique look, like the deserts of the American Southwest, or very recognizable landmark images, like the Eiffel Tower. "It succeeds about 16 percent of the time," said James Hays, a computer scientist at Carnegie Mellon. This number is 30-times better than random chance or a educated guess. They also say the rates will improve as people continue to upload and share photos in cyberspace, giving the program more data to pull from.

Computer scientists say the program could eventually be used in forensic investigations by detectives or in the military.

Pictures obtained courtesy of the U.S. Army

The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS satellites circle the earth twice a day in a precise orbit and transmit signal information to earth. Receivers take the information transmitted and use a combination of signals to calculate the user's exact location.

Crime Scene Measurements Can Be Taken From A Single Image

2 December 2009

Diego González-Aguilera and Javier Gómez-Lahoz are researchers from the University of Salamanca [Spain] that have developed a procedure to enable forensic police to extract metric data from crime scenes and making it possible to reconstruct a crime scene in 3D by using a single photograph. They have recently published their study in the December 2009 *Journal of Forensic Sciences*, offering "a novel approach for documenting, analyzing and visualizing crime scenes."

A captured image must include easily-identifiable details and at least three vanishing points (the convergence point of straight lines projected in one direction) as well as at least one distance in the scene. These data are used to extract the structural components or most important objects in the image.

González-Aguilera says it is better to use a single image as it is difficult to ensure a range of photos overlap well, and there are always parts of the scene or some features of it that cannot be correctly related to the rest. "Until now, this discipline required at least two images to be used in order to reconstruct a crime scene, but now we have broken that barrier." The new technology makes it possible to introduce known "restrictions" into the scene, such as the presence of parallel or perpendicular planes, enabling them to be represented in 3D.

As structural features are geometrically related to the features of the scene and the camera, it is possible to take measurements and to analyze the dimensions of the scene based on distances, angles and surfaces.

This means that, at any time after having taken a photograph of a crime scene, forensic police could establish that a knife was 32cm away from the victim, or that there was an angle of 37 degrees between a trace of blood, footstep or bullet hole.

Journal Reference:
Diego González-Aguilera y Javier Gómez-Lahoz. **Forensic Terrestrial Photogrammetry from a Single Image**.*Journal of Forensic Sciences*, 2009; 54 (6): 1376 DOI:10.1111/j.1556-4029.2009.01170.x

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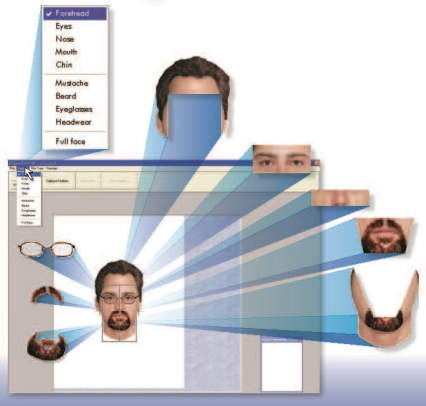

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Picture courtesy of artist, Jon Carter.

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