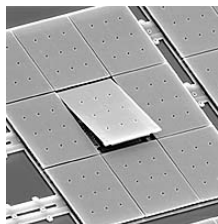


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By: Bogdan Solca, Hardware Editor



Megapixel Images in 1 Pixel

Extreme image compression yields high quality results

Researchers from Rice University are working at an imaging technology that will allow cameras to capture megapixel quality pictures using only one pixel. The technology facilitates the use of fewer sensors to create higher resolution images. Richard Baraniuk and Kevin Kelly from Rice University have been working for two years to develop a camera that could replace the traditional digital pixel with an array of micro-mirrors. The technology works something like this: each mirror points either toward or away from a single light-sensitive pixel; when an image focuses on the mirrors, the light breaks into a random pattern recorded by 1 pixel. In order to identify the simplest possible image consistent with the samples provided by the pixel, the camera has to use a computer algorithm which has been in development during the past two and a half years. "Richard Baraniuk and Kevin Kelly are part of a growing movement in the imaging community toward intelligent image processing," said Sean Varah, CEO at MotionDSP Inc., a software company with image processing technology that reconstructs low-res video images into high. "Hardware has limits, and to get past those limits, you need intelligent software. Their work is very promising as it combines both hardware and software expertise." Comparing the new compression algorithms to JPEG ones, Baraniuk claims that the new imaging technology requires less compression and this also improves battery life and memory space management. "The technology could allow smaller hardware, and lower power, but it also would enable us to build cameras where current digital cameras are blind, such as far inferred ultraviolet and terahertz cameras," Baraniuk said. Other researchers state that the new technology can work well when taking pictures at night, where visible light isn't present. In this case, infrared frequencies are easily captured by cameras equipped with the new technology. The technology will be demonstrated at the Optical Society of America's annual meeting in Rochester, N.Y.