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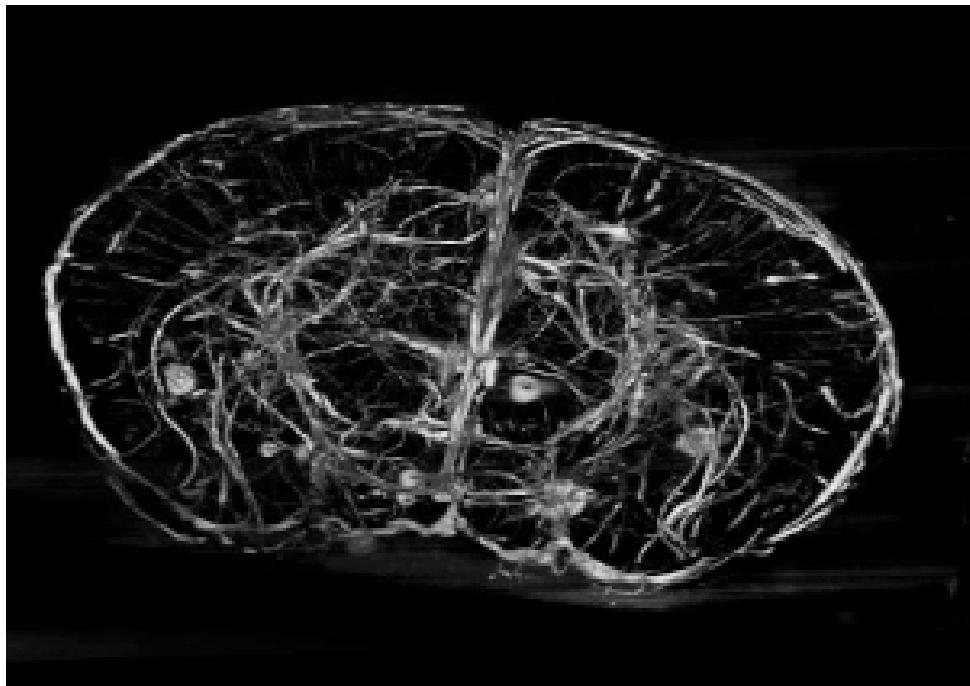
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With a Knife as a Microscope, 3Scan Maps in 3D



David Holley
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Xconomy San Francisco — There was a beauty salon on Mission Street in the South Market neighborhood of San Francisco that went out of business. Occasionally, people still wander in looking for a trim. The new tenant, **3Scan**, has to explain that hair styling is not a service they offer, even though they do have knives.

"You don't want our sharp objects to come near you," said 3Scan CEO Todd Huffman.

Indeed, the device that the company builds from scratch can deconstruct any kind of biological soft tissue into microscopically thin, almost transparent slices. At the same time, the machine scans and analyzes those samples like a microscope. Finally the **device**, called a Knife Edge Scanning Microscope (KESM), creates three-dimensional imagery from the large datasets it collects.

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The result is that 3Scan's device can take a tissue sample, say a tumor from a lab animal, and make a 3D map of it. That map might let you see in detail each one of the tumor's vessels, for instance, or the distance between the branches of those vessels, or even just the surface area of the tumor as a whole. That could open up a host of applications for biotech and pharma drug companies that are trying to find as much out about the tumor as possible, to potentially develop more effective, targeted treatments.



3Scan's Todd Huffman

"We can do a comprehensive measurement of that tissue morphology," Huffman said in a telephone interview. "If you're trying to cure cancer, you'll do a better job of curing the cancer if you can measure the impact of what you're doing on the tumor."

Lux Capital was sold on the company's potential. The New York firm **closed** a \$6.7 million Series A funding round with 3Scan last week to help the company add new capabilities to the machine, and then build more KESMs.

The venture funding was a significant mark for a company with a grassroots, academic beginning.

As a master's student pursuing a degree in bioinformatics at in the mid-2000s, Huffman started developing theories about how to make the process of microscopy more automated.

That's when he met Bruce McCormick, a renowned computer scientist at Texas A&M. McCormick had been thinking along similar lines, and he had an idea for a material that could allow you to simultaneously view, analyze, and cut very thin samples: diamonds.



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McCormick's idea was to form diamonds into knife-like shapes that could cut a sample into a layer smaller than a micron, while scanning the sample by illuminating it with light passing through the diamond. The vision behind 3Scan was born.

It took a few more years for the company to form. McCormick, who was also the founding director of the Brain Network Lab at A&M, where the KESM technology was **developed**, passed away in 2007 as he neared his 80s. It was before he could put the technology into practice, Huffman said.

Knowing the university still held the patent for the technology of KESM, Huffman returned to A&M and licensed it. "It's something we need to do to move biology forward," Huffman said.

He founded 3Scan with COO Megan Kilmen in 2011.

3Scan had good timing. Breakout Labs, a philanthropic, science-focused organization that funds early stage companies with up to \$350,000, opened in November 2011. It was created by the Thiel Foundation, whose namesake, Peter Thiel, is the famed first outside investor in Facebook, the co-founder of PayPal, and an all around investment guru.

Breakout Labs **funded** 3Scan in April 2012.

Now, with another round of funding under his belt, Huffman is building the business. While the device can already produce 3D images in grayscale, 3Scan is working on adding color images, including fluorescent images, to its repertoire. The latter could be particularly useful for pharmaceutical companies that transgenically modify cells to produce a fluorescent protein when the cell becomes cancerous, Huffman said.

3Scan does almost everything, from engineering to the machining of metal, in-house.

Though the company may sell some of the machines to very large research laboratories, its operations are largely on a service model, Huffman said. The vast amount of data that comes from imaging a sample—3Scan processes terabytes per day—makes it unrealistic for most research labs to own, he said.

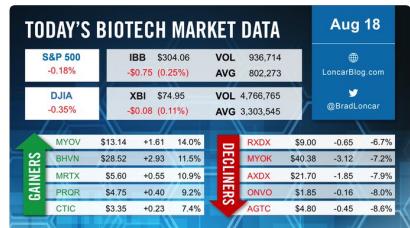
The Brain Networks Lab at A&M and Kettering University in Flint, MI, are among the clients 3Scan has landed so far. DARPA, the Defense Advanced Research Projects Agency, was its first customer with a \$30,000 project. 3Scan has won multiple six-figure contracts, Huffman said, declining to provide further detail about the company's finances.

For now the 3Scan device is exclusively used as a research tool, but it's possible that it could eventually be used for diagnostics as well, Huffman said. That possibility is a few years down the road, he said.

Another round of funding is in the plans, too, though there is "nothing immediately coming up," Huffman said. Huffman recently brought 3Scan's **employee** count to 11, after adding an expert in light microscopy and an algorithm designer for the device's computations. He also added a front office manager to help keep his engineers happy.

"Well-fed, caffeinated engineers are 30 percent more effective," Huffman joked.

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When a fantastic summer intern says to you in a thank you note, "I look up to you"



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