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Patent-pending process improves eye disease detection

The power of light

Memphis Business Journal - by [Michael Sheffield](#)

A collaboration between two professors at the **University of Memphis** and **Southern College of Optometry** could result in earlier detection of retinal diseases through a patent-pending testing process.

The Pseudo 2D Fractal Analysis was developed through a collaboration between Khan Iftekharuddin, associate professor in the Department of Electrical and Computer Engineering at the University of Memphis, and Pinakin Gunvant, assistant professor at Southern College of Optometry.

The process uses light beamed through the back of the retina to measure the thickness of retinal tissue at certain points. If the tissue is thick at the "12 and six o'clock" points, it is an indicator of glaucoma. The reflection of the light provides an indicator of the tissue's thickness.

Gunvant says previous testing methods were accurate 85% of the time, but the 2D method has proven to be 98% accurate.

"That's very clinically significant," Gunvant says. "But you're not inventing new devices. You're just analyzing the data better."

Gunvant and Iftekharuddin were doing separate research, with Gunvant focusing on retinal research at the Southern College and Iftekharuddin doing imaging work at the U of M. Gunvant said neither of the two had any idea the other existed until he looked Iftekharuddin up online. Ironically, the U of M professor was out of the country when Gunvant first contacted him.

"I found him through my good friend, Google, and he was right down the road," Gunvant says. "If it wasn't for technology, we might have never met."

Iftekharuddin had used imaging to detect brain tumors through work with **St. Jude Children's Research Hospital**, but hadn't done any research with glaucoma. He says fractal imaging is able to pick up any irregularities in shapes or signals.

"We just took that and applied it to glaucoma and the results turned out to be excellent," Iftekharuddin says. "Like any other disease, if you diagnose early you can treat it better."

Once the two professors ensured the technique worked, the University of Memphis began the patent process, which can take up to three years. But it could also yield a viable product for the school to market and license, says Kevin Boggs, director of technology transfer and research development at the University of Memphis.

Boggs says the length of the patent process won't prevent the two schools from marketing the product to companies that have a history of licensing patent applications.

"Once they're familiar with the product, they'll invest in it knowing the odds of getting a patent," Boggs says. "There are a couple of options. We could either go with an exclusive or non-exclusive license, but we'd have to look at what would bring the product to the broadest possible market to help the most people."

Gunvant says the technique could also detect other causes of blindness, like diabetes or macular degeneration. The immediate focus, however, is glaucoma, which is the second-leading cause of blindness in the world and the leading cause of blindness among African-Americans.

Gunvant says the new focus of the research will be trying to reach 100% accuracy.

"I doubt we'll ever hit 100%, but most scientists get proven wrong in 15 years," Gunvant says. "Glaucoma is very variable and affects different individuals in different ways. We'd have to do a very large scale study to get better than where we are at the moment."

Gunvant says the technique probably would not have been perfected without the team effort.

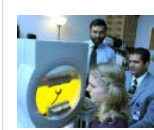
"It's hard to be an expert in every field, so multi-disciplined collaboration is required," he says. "When you look at a problem from one angle, your brain gets fried, so you have to have someone else to come in and help you solve it."

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Khan Iftekharuddin and Pinakin Gunvant administer eye test for Kendra Dalton.

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