

Two passionate professors approach multiple sclerosis from different angles.

MS Making Strides



John Quarles, assistant professor of computer science, knew what multiple sclerosis can put someone through—watching his sister Jennifer be diagnosed, he understood all too well. Then life unfortunately made him understand better.

Diagnosed himself in 2005, Quarles has taken on this debilitating disease, which causes everything from lack of muscle coordination to even disorientation, with his greatest weapon—technological wizardry.

“Several of my projects are about improving rehabilitation,” says 32-year-old Quarles. “I’ve found it can make it more motivating to take somebody and put them in a place other than a rehab clinic. Why not be in a castle game, rather than rehab exercises? I took my interest in the virtual world and found a way to apply it to multiple sclerosis...Why not involve something like a dragon, make it fun?”

And why not just let them feel like they belong?

“We have all of these charity walks for people with MS but many of the people who have it can’t participate,” he says. “We thought of a way to change that.”

One example involved the Walk MS event at the AT&T Center in San Antonio. Given models of the Center that were incredibly elaborate allowed Quarles and his team a chance to carve out a virtual recreation. Now those on a computer could “walk” the Center and feel they were a part of it.

“We have a laptop set up for this but the eventual goal is to integrate (next year) with mobile phones so they can talk to people throughout a real walk,” he shares. “Someone can virtually say, ‘Meet me at this part of the Center.’ Then when the walker gets there, it really feels like they’re together!”

With a team of students ranging from a PhD student to undergrads, it’s a project that the National Multiple Sclerosis Society even invested in. “Hopefully we’ll have people virtually walking to many places before it’s done.”

Other Quarles’ work focuses on helping people with MS with mobility. Employing a video game development tool from Unity Technologies, his team is observing how a game interface cane can help someone with MS use a real one.

“A cane is just for balance but there’s a tendency to put weight on it,” he says. “That has several negative physical effects over time...When you put weight on it, you’ll slow down in the game...Your competitiveness hopefully takes over and you use that cane better long after the game is over.”

In addition, his team is studying the effects of working with an avatar. Here users see a virtual body when they look down at themselves in virtual reality. And when they move their actual body? Their avatar moves along with it.

“It is interesting that when people have an avatar in the virtual world they tend not to be affected but MS patients will not walk as well,” says Quarles. “For certain rehabilitation, this shows that you may not want to give them as much visual feedback from their avatar...On the other hand, we also found that when



you speed up their walking as an avatar it can make them feel they are walking better. The results are fascinating.”

His sister seems to think so—she’s been involved as a subject in much of his testing. “She gives great feedback and, more than that, she’s been a great support for me,” he says. “We understand each other and navigate MS with the help of each other...That’s a big goal with my work—to help others feel more comfortable.”

Saying Game Over to MS

But eradicating the disease itself? That’s a whole different dragon to slay.

Still, Thomas Forsthuber, MD, PhD, believes his and other leaders’ work shows it is possible.

“You have to remember that 20 years ago there was little treatment,” says Forsthuber, who has been at UTSA since 2005. “When I was in medical school, I attended a class and learned

about MS. The professor was talking about how limited things were in what could be done. What we did know was that this awful disease was taking young women in their best years, some of them young mothers, and it was just destroying their spirit.”

Forsthuber has been studying a mouse model of experimental autoimmune encephalomyelitis to unlock the disease, with major backing from the National Multiple Sclerosis Society and the National Institutes of Health. Forsthuber has been part of a joint effort, which includes Provid Pharmaceuticals, to affect a pathway in the disease that can provide therapeutic benefit. Working on the PV-267 inhibitor, the goal is to produce molecules that work with immune cells to disrupt how MS attacks the brain.

Forsthuber’s molecule studies have yielded encouraging results but are admittedly expensive just to test. “Each molecule (we test) is \$1,000—and we just went

through 14 or 15 that fast,” he says. Forsthuber is continually encouraged that every molecule could get us closer to a cure. “I can look people in the eye and say a cure could just be a few years away, that someone is going to do it,” he says. “But what has to happen for our work is to take what he have learned already into studies where we can look at clinical trials or samples from patients, to analyze blood samples.”

Extensively published, including as a co-author in *The Journal of Immunology*, Forsthuber hasn’t lost any of his energy from the day he stepped into a classroom and learned of the once hopeless fate of MS victims. “So many lives hang in the balance and we can’t stop believing now,” he says. “You have to realize that we’re not just researchers in labs. I’ve met many people with MS through my work and I care deeply about them. I come to the lab every day for them—that one day they will be free.”