Micro-windmill research encourages innovation

By Benjamin Owens, The Shorthorn staff | 0 comments

Thou faculty associate researcher Smitha Rao and electrical engineering professor J.-C. Chiao want students to benefit from their invention of a micro-windmill, which could change the way humans harness energy in the future, they hope to see students inspired to pursue their own inventions.

“I want students to think on their own, not to focus on what we have done but what they can do,” Chiao said. “I believe those who don’t have the advanced materials, now, can still have the imagination to lay out the fundamentals of future invention.”

Rao, a former student of Chiao’s, said she accidentally found her inspiration for the design Chiao was looking for from watching her daughter playing with a pinwheel in her apartment. She said the sight reminded her of a challenge Chiao once offered her and the rest of his students to fabricate a 3D windmill from silicon in his advanced microelectromechanical systems class.

“Sometimes a crazy idea may not need as much scientific processing as you believe it does,” Rao said. “When I was a student with Dr. Chiao, he handed out sheets of paper and told us to make [microelectromechanical systems] devices from them to challenge our creativity. Now I tell my own students to save their cereal boxes and attempt to create working models from them.”

With a height of 20 microns and a diameter of 1.8 millimeters, the micro-windmill has the potential capacity to power cellphones and wireless sensors in ways solar energy cannot. The diameter of a strand of human hair is about 90 microns, Chiao said.

Chiao said they are working with the Office of Technology Management to protect the intellectual property and licensing agreements of the micro-windmill invention.

Teri Schultz, director for the Office of Technology Management, said the office is responsible for receiving intellectual property disclosures relating to technology created by faculty, staff and students. Students who choose to prosecute their patents through the office may save the money they would have spent employing a patent lawyer separately.

“If UTA decides that it will pursue protection of the technology and then market the technology to find a partner to further develop it, UTA will cover those patent costs upfront,” Schultz said. “UTA will typically be reimbursed for those costs from the eventual...
Schultz said intellectual property refers to any work that is the result of creativity and can be protected by statute or legislation. It includes inventions, trademarks, industrial designs, discoveries, know-how, processes, trade secrets, physical embodiments of intellectual efforts such as models, machines, devices, apparatus, computer programs and chemicals and copyrights.

“Intellectual property is important to UTA because it furthers UTA’s focus on pursuing new knowledge and its goal of having its researchers devise products and processes that foster a healthier, safer and more productive society,” Schultz said. “The inventors are involved throughout the entire process, from evaluation of the technology, to filing the patent application, to corresponding with the patent office.”

Rao said the promise the windmill would work originally brought disbelief to many, but after WinMEMS shipped back its first batch she immediately filmed a video of the blades moving. She said now the exposure the invention is getting is helping her and Chiao realize the application and opportunities the device holds.

“When we show the video and we see the looks on people’s faces, we realize this is a big deal,” Rao said. “They offer a different perspective on what we do every day.”

Though this technology altering device is measured in micrometers and millimeters, Chiao said the feeling he has seeing a former student succeed can not be measured by any scale.

“Every student is an investment of time and effort,” Chiao said. “It’s like how every parent thinks of their children. You want something you can be proud of, but not necessarily money and fame. When I get an email from students who have been successful, it makes it all worthwhile. There is a satisfaction deep down in your heart that cannot be quantitatively measured.”

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