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Small in Size, Big in Promise

University of Dayton

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Monday August 14, 2017

Small in Size, Big in Promise

A soon-to-be-patented postage-stamp-sized ceramic module developed in part by a pair of University of Dayton electrical engineering researchers is the catalyst for a startup company and high-tech manufacturing jobs in the region.

Working with Spectral Energies LLC on a \$150,000 U.S. Air Force Small Business Innovation Research (SBIR) Phase-1 grant, the duo — Guru Subramanyam, professor and chair of the electrical and computer engineering department, and Vamsy Chodavarapu, associate professor of electrical and computer engineering — established Prixarc LLC to market the more affordable and reliable system for aerospace engine control and diagnostics. The new system will operate at higher temperatures, in harsher conditions and for longer durations than current systems.

Subramanyam and Chodavarapu said there are no aerospace engine control systems that can run for extended periods of time at temperatures up to 437 degrees Fahrenheit (a little more than twice the boiling point of water). Because the new system can withstand higher temperatures, it can be placed closer to the engine. That will reduce wiring in planes, thus decreasing aircraft weight, the communication time between engine and the computer, and reduce maintenance costs because of a simplified aircraft design.

Spectral Energies is in the process of creating one job to support work on the technology with another two jobs in the future. Prixarc hopes to create another position, according to Subramanyam and Chodavarapu. Both companies will provide internship opportunities for students that could lead to full-time positions.

"We're happy to generate high-tech, advanced manufacturing jobs for Ohio and provide internship opportunities for students close to campus," Chodavarapu said. "Startup companies enabled by

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technologies created at universities are relevant to students because they can see the work they do in labs getting into the marketplace."

To further develop this technology and fund job creation, the project received a \$750,000 SBIR Phase-2 grant. In phase two, the group will test new systems for more than 10,000 hours at temperatures exceeding 450 degrees Fahrenheit. This technology could be applied to the automotive industry and oil and gas exploration that takes place in harsh, high-temperature environments.

The Air Force Small Business Innovation Research (SBIR) program is designed to stimulate technology research by small businesses while providing the government with cost-effective technical and scientific solutions to problems. The program also encourages the small businesses to market the technology in the private sector.

The duo is also developing wireless, battery-less systems for smart infrastructure such as electric grids, smart homes and smart cities by scavenging power from available cellular networks.

For more information, contact Shawn Robinson, associate director of news and communications, at 937-229-3391 or srobinson@udayton.edu.

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