

PREDICTING SUCCESS



Bharat testing his seizure prediction software

GRADUATE SPOTLIGHT: Predicting Success

As an inventor, CEO and doctoral researcher, Biomedical Engineering and Computer Science graduate student Bharat Karumuri has had a busy year. He has assisted in advancing a pacemaker for the brain, helped start a medical software company and collaborated with experts across the nation to build a business all while maintaining his duties as both a student and a research assistant at Dr. Leon Iasemidis' Brain Dynamics Laboratory at Louisiana Tech University.

Bharat has focused his research on predicting epileptic seizures since joining Dr. Iasemidis' team at the Brain Dynamics Laboratory in 2013. This research has led to his work with IntelliPace, an embedded software module that predicts and prevents seizures with a high rate of accuracy. Bharat helped develop the module, which enables programmable, implantable brain stimulators that have higher rates of therapeutic efficiency and fewer side effects than those found with modules that already exist in the neuromodulation market. His presentation of the product won second place and \$1,500 at the 2016 Louisiana Tech TOPDAWG New Venture Championship last spring.

IntelliPace is one of three products offered by EpiFocus, LLC (EpiFocus), a company that Bharat helped found and for which he currently serves as CEO. As with the development of IntelliPace, many of Bharat's duties as acting CEO of EpiFocus, the medical software company that he co-founded with Dr. Iasemidis, director of the Center for Biomedical Engineering and Rehabilitation Sciences, professor and Rhodes Eminent Chair of biomedical engineering and head of The Brain Dynamics Laboratory, are natural extensions of his doctoral research. In addition to developing new products to help detect and prevent seizures, Bharat interacts with investors and experts across the nation

and works with Dr. Iasemidis and other advisory board members to file patents and run clinical trials for U.S. Food and Drug Administration approval.

Working closely with advisory board members, Dr. Leon Iasemidis; Dr. Kostas Tsakalis, professor of electrical engineering at Arizona State University; Dr. Ioannis Vlachos, assistant professor of mathematics and for the Center for Biomedical Engineering and Rehabilitation Sciences at Louisiana Tech; and Dr. Balu Krishnan, research associate at the Epilepsy Center of the Cleveland Clinic, who have more than four decades of research experience in brain research, and have produced several breakthrough technologies in seizure prediction and control, Bharat has developed an award-winning business plan.

The EpiFocus business plan won six months of business incubator space and \$20,000 in seed money, and will be located in the Enterprise Center. The company has two utility patents and has submitted an additional patent for review. Once Bharat completes his doctoral degree, he expects to shift even more energy into growing EpiFocus. He also plans to extend his expertise in epileptic seizure prediction.

"Backed by such eminent scholars and the support of our collaborators, I strongly believe we can make EpiFocus, LLC the next big healthcare technology company," Bharat said.

In addition to his work with EpiFocus, Bharat has authored a book chapter and six papers in nationally recognized conference proceedings. He serves as an assistant editor for the *E & S* magazine and has received numerous awards and scholarships for academics and research. He expects to graduate next summer with a



"As a biomedical engineer, the greatest good that I can do for another is use my knowledge to make medical technology more impactful and accessible to doctors and patients."

– Bharat Karumuri

doctoral degree in Biomedical Engineering and master's degree in Computer Science.

Bharat earned his first two Louisiana Tech degrees (a Master of Science in Microsystems Engineering and a Master of Science in Engineering with a concentration in Biomedical Engineering) researching brain cancer cells with Dr. Mark DeCoster, associate professor of biomedical engineering, before shifting his focus from studying cell cultures to developing algorithms.