News

Press Releases
Event Announcements
CCT Weekly
Grants and Funding
Student News
Archived News

LSU Cybersecurity Offerings, Capabilities to Expand With FIREStarter 2

LSU College of Engineering

BATON ROUGE, LA – Last fall, LSU announced a new initiative named FIREStarter, which would provide students with training in cybersecurity and threat analysis through the creation of a lab for cyber range exercises. These exercises would be conducted in partnership with Louisiana State Police and industry to simulate real-time cyberattacks on large-scale enterprise and control systems.

A new grant of approximately $350,000 from the Louisiana Board of Regents Cybersecurity Talent Initiative Fund—there will be a future $100,000 match from an industry partner—will help build on last year's announcement by establishing the FIREStarter 2 laboratory. More specifically, the grant will fund digital forensics and industrial control systems hardware and software and allow LSU to expand its hands-on applied cybersecurity courses, as well as support research into industrial control systems security.

"FIREStarter 2 is basically all hands-on [experience]," said LSU Computer Science Professor Golden Richard III, principal investigator on the project and director of the Applied Cybersecurity Lab at LSU. "We will be putting the same software and hardware components in the lab that digital forensics practitioners use on a day-to-day basis to work real cases. It's our anticipation that every student in the cybersecurity concentration, plus any other interested computer science students [and possibly more from other disciplines], will have the opportunity to be exposed to state-of-the-art hardware and software tools for digital forensics and industrial control systems.

"From the industrial control systems [side], we will have both equipment for teaching students the basics of programming PLCs, as well as small-scale 'simulations' of real industrial control systems, e.g., a water-treatment plant, power plant, etc. These are really cool and on roll-away carts, with the real hardware tucked inside. This means that you can formulate real attacks and defenses and see if they work.

Richard is joined on the project by co-PIs Gerald Baumgartner, associate professor of computer science; Nash Mahmoud, associate professor of computer science; Juana Moreno, professor of physics; and Fernando Alegre, associate director of the LSU Gordon A. Cain Center for STEM Literacy.

The FIREStarter 2 grant comes on the heels of LSU President William Tate IV's announcement of his Scholarship First Agenda, which includes five strategic priorities that will help elevate LSU and Louisiana to the benefit of everyone. One of those includes defense and cybersecurity and the role LSU will play in being a leader in both.

Richard said this new initiative is part of that larger goal and will develop homegrown talent that will ultimately help enrich and secure the state.

"Louisiana is loaded with industrial control systems—chemical, petroleum, et. al," he said. "Teaching students to defend these systems, and ultimately creating a local workforce that can tackle this challenge, is practically a no-brainer if the resources are available to do it. And now they are. From a digital forensics standpoint, there are virtually no digital forensics firms left in Louisiana. All the practitioners have been slurped up by bigger firms. We'd like to change that and repopulate Louisiana with brilliant digital forensics practitioners."

Looking past the FIREStarter 2 project, Richard and Andrew Case, senior cybersecurity consultant in the LSU Applied Cybersecurity Lab, will soon be representing LSU on one of the biggest cybersecurity stages in the country when they present at this year's Black Hat conference in Las Vegas. They will be joined by Gustavo Moreira and Austin Sellers and will be presenting on "New Memory Forensics Techniques to Defeat Device Monitoring Malware."

It's the second-straight year for Richard and Case to deliver a talk at the conference. In 2021, they delivered a presentation on "Fixing a Memory Forensics Blind Spot: Linux Kernel Tracing."

"LSU's applied cybersecurity program produces the best memory forensics research in the world," Richard said. "That's one of our primary strengths, and both Black Hat talks present(ed) cutting-edge memory forensics work aimed at detecting stealthy malware. Presenting at Black Hat provides amazing exposure for the program, as the conference is attended by thousands of cybersecurity professionals from academia, industry, and government."

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