

Researcher develops technology to improve efficiency at construction sites

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A Purdue University graduate's ideas to utilize sensors and a software platform could lead to greater efficiency at future construction sites.

Joseph Louis, who recently earned a doctorate in [civil engineering](#) from Purdue's Lyles School of Civil Engineering, used technology he was working on while he was pursuing the degree to co-found SAMCRO Technologies LLC along with his adviser Phillip Dunston, a professor in the Lyles School of Civil Engineering. SAMCRO stands for Simulation Analysis Monitoring and ContRol of Operations.

The company is working to license technology Louis developed during his doctoral research under Dunston's guidance that combines pre-existing sensors on equipment at a construction site with an operational model of the site. Together the components provide a real-time overview of the site via a [software platform](#), which could help control time and cost overruns.

Louis compares the system to making use of the onboard diagnostics in current passenger vehicles.

"For example, sensors on a truck can tell you its speed, how much payload it's carrying, whether the bed is up or down," he said. "The idea is to determine what the truck is doing - its state - at any given moment and feeding it into an operational model. Once the current task is complete, the operational model is updated in real-time to reflect the latest status of the operation."

The technology puts the sensor data into the context of the operations, which allows the manager to monitor progress; make real-time, data-driven tactical decisions; and automate the worksite at an operational level.

"Conventional software tools provide managers only a high-level view by specifying what work is to be done, but not how and not in real time. Our technology allows for the analysis, monitoring and control of operations," Dunston said. "By having the required level of detail in the operational model, it then becomes possible to specify and automate exactly how the work gets done."

Large project sites in the construction, mining and agricultural sectors involve operations that are equipment-intensive and performed in evolving outdoor environments that are not amenable to conventional control methods used in other industries like manufacturing, according to Dunston.

"Managers need the most current technology to provide them with real-time operational status updates about the performance on the site because the resources involved are spread across large areas that require complex collaborations," Dunston said. "Without this information, they could face decreasing margins and cost and time overruns."

Louis and Dunston decided to license their innovation after interaction with the Purdue Research Foundation Office of Technology Commercialization. They enlisted the help of Purdue Foundry, an entrepreneurial accelerator for Purdue-affiliated entrepreneurs.

"The Purdue Foundry helped us significantly," Louis said. "Our entrepreneur-in-residence has given us invaluable advice on the path forward on talking to investors or others who might be interested."

Through their involvement with the Purdue Foundry the founders also met potential customers and other construction technology professionals who helped them move the company forward.

While SAMCRO is still in its early stages, the founders are in talks with a company interested in licensing the technology. They are also interested in working with collaborators who could assist in field testing.

While Dunston foresees potential future implications of the software platform when robots and autonomous equipment become the norm on project sites, the company is now focusing on current construction technology.

With current technologies available to construction professionals the founders believe their timing is right to move the idea forward.

"We don't see it as a ship that has already sailed," Dunston said. "We see it as a wave that we can catch."

Provided by Purdue University

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