Fastmarkets AMM

www.amm.com
Friday August 7, 2020 | Volume 128 | Number 32-5

Safety tech supports mill output: Everguard.ai

Everguard.ai is advancing safety technology with "sensor fusion." Fastmarkets explores this artificial-intelligence (AI) safety system, which is being employed to reduce operational downtime due to accidents at steelmakers - and has the potential to boost a company's bottom line.

Sensor fusion, a technology central to self-driving vehicles, collects inputs from many computer vision cameras - which identify and process images in the same way that human vision does - that are placed on stationary and moving equipment inside the factory, as well as from devices on individual workers in the factory.

The monitoring data is fed into a central system for artificial intelligence analysis and processing to create a near-immediate output to managers and workers, notifying them of safety threats, according to Sandeep Pandya, chief executive officer at the Irvine, California-based company.

"We have built a proxy for autonomous vehicles systems and dropped it into the workplace... to prevent an accident and not just report on it," Pandya told Fastmarkets in an interview.

The AI technology system, known as Everguard Sentri360, was initially deployed at a SeAH Group steel factory in South Korea. After further refinements, it was installed at West Coast Pipe, a division of SeAh Steel America, in Rialto, California; the factory produces welded steel pipe for water transmission.

Now Everguard.ai is looking to sell the idea to other US steel factories, such as those that produce hot-rolled coil, where the system could reduce operational disruptions and help keep factory production schedules on time, according to Pandya.

Fastmarkets' daily steel hot-rolled coil index, fob mill US was calculated at $22.91 per hundredweight ($458.20 per short ton) on Wednesday August 5, up by 3.8% from $22.08 per cwt a week earlier on July 29 but down by 4.8% from $24.06 per cwt one month earlier.

Everguard.ai is also looking to deploy the system to service centers in the metals industry.

The new technology is designed to prevent events such as the recent blast furnace explosion at ArcelorMittal's Burns Harbor steelmaking complex, which can result in forced downtime, an investigation by the US Department of Labor's Occupational Safety and Health Administration (OSHA), and costly maintenance and repairs, not to mention potential worker injuries or death.

How it works

Pandya sought to differentiate his product from notification and monitoring systems that factories currently use to report when safety protocols are breached.

"It's really about getting ahead and warning the worker," Pandya explained.

Sentri360 can alert people in the factory of an imminent threat to safety or health and give them an opportunity to react and take steps to avoid the potential threat, he said.

"We use a collection of technologies that circle the worker, including high-definition cameras, radar and power location technology," he said.

"We actually create AI hard work processors that represent the brain," he said. When the "brain" sees a potential threat after analyzing the data, "it can alert the worker in less than half a second," Pandya said.

Pandya compared fusion technology to the way a driver uses more than one sense when reacting to a fallen branch in the road or to a rain-soaked highway. The algorithms in the Everguard.ai system allow for similar split-second decisions to alert workers about any definable risks and present dangers, Pandya said.

Pandya offered as an example a situation where an overhead crane operator is in the process of moving a coil or beam across a shipping bay, and another worker with his back to the crane is about to walk directly under the heavy load being moved by the crane.

"A camera can detect if a person is looking in the right direction," Pandya said. In this hypothetical case, the Everguard.ai system can "see" via one of the cameras it has installed in the factory that the worker has his back to the crane.

A second camera on the crane can tell the system that the crane is moving a load that will

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pass high over the path of the worker. The data from the two cameras is analyzed "almost instantaneously" as an imminent danger.

The system can then send an alert to buzz the biometric device on the worker's wrist, warning him of danger. The system can also notify the crane operator someone is about to walk under the crane's moving load, giving the crane operator an opportunity to stop the movement of the crane, Pandya said.

In addition, computer vision, using radio waves, can "learn" from experience. Computer vision is first able to detect whether a worker in a well-lit area of the plant is wearing a helmet as required. In time, the computer vision capability can be enhanced with experience and it can "learn" to detect whether a worker is wearing a helmet in a dimly lit part of the plant, he explained.

Speaking of how the Everguard.ai system works in electric-arc furnace (EAF) factories, Pandya said: "I realize plants are running 24/7 almost 365 days a year. You can't just drop a bunch of cable in there and stream video back to the system. No CEO of a plant will allow that," he said.

Instead, Everguard.ai has designed its system to be "surgical." A company can "deploy the technology to the most risky areas," making it more cost effective for plant operators, Pandya claimed.

Health monitoring

Everguard.ai also is working to enable Sentri360 to monitor and limit the spread of Covid-19, according to Mark Bula, chief strategy officer.

"We're trying to use computer vision and sensor fusion to detect and hopefully trace Covid-19 and then try to quarantine sooner and to help keep a company from having dozens of workers away from work," Bula said.

"We can't stop the spread of the virus. It's not our job. But what we can do is make sure the company's supply chain isn't dramatically impacted," Bula said.

Everguard.ai hopes to incorporate some of the current Covid-19 monitoring practices already employed in factories, such as those used by Ford Motor Co.

"Ford workers wear watches that beep if they get within six feet of one another. They also test the skin temperature of everyone coming into the building," Bula said.

"We see an opportunity to help, and that's what we are trying to do," he added.

Everguard.ai is implementing a version of its software that monitors health, specifically Covid-19 issues, as well as general worker safety at West Coast Pipe.

Big River Steel

One of the steel companies Everguard.ai hopes to convince to use its system is Big River Steel. The company is reviewing Everguard.ai's Sentri360, according to David Stickler, chief executive officer of Big River Steel.

"To the extent our analysis [finds that this technology] provides value in terms of enhanced safety, we would not hesitate to use something like this," Stickler said.

Still, Stickler was concerned that a software program like the one from Everguard.ai not become a substitute for proper worker training, and that the system not trigger too many unnecessary alerts or warnings, which could impede operations and even decrease safety.

"We have to make sure people don't get a false sense of security just because of a new safety software package," he explained, adding: "We want to do rigorous testing under live operating conditions such that false negatives are minimized."

Stickler noted that other vendors have been to Big River Steel with presentations about safety systems with enhanced capabilities and expects even more of these presentations in the future. But in the meantime, Everguard.ai's Sentri360 has caught his attention.

"The fact it is being used successfully in Korea is something we don't ignore," Stickler said. "We're always interested in learning about new ideas and thoughts people have. We will be open to listening, but we're going to err on the side of not becoming dependent on these types of tools but instead use them to provide employees with information so they can act on that information sooner."

He directly addressed the advisability of having any safety system that can automatically stop an overhead crane if a worker is an area that might pose danger and was wary about any system that prompts automatic shutoffs.

"Stopping an overhead crane automatically creates other hazards that might otherwise not be there," he noted. "At Big River Steel, a number of our areas are continuous in nature, so stopping a part of a continuous operation causes other impacts, some of which may create their own safety hazard."

Stickler prefers that any new software system that he might install only warn employees to take action rather than automatically causing the action to be taken.

"It has to be a tool that gives our employees additional information or gives them that information earlier than they would have it," he said. "If there's a piece of mobile equipment in a blind spot and you can signal to that employee 30 seconds earlier, that's 30 seconds more an employee can take whatever action he would take coming into their safety zone. That's valuable."

Everguard.ai is a joint venture backed by Boston Consulting Group Digital Ventures and SeAH Global, a division of SeAH Group, a conglomerate based in Seoul, South Korea.

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