Interview: Prasad Akella, Founder and CEO of Drishti

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I recently caught up with Prasad Akella, Founder and CEO of Drishti to discuss how factory use of AI technology is gaining a lot of traction, and how his company uses the commercial application of action recognition and AI innovations to automatically digitize human actions inside the factory. Dr. Akella transformed manufacturing in the 1990s as leader of the General Motors team behind the world's first collaborative robots ("cobots"), projected to be a $12 billion market by 2025. With cobots, Akella advanced robotics to safely amplify workers' physical capabilities. With Drishti, Akella returns to the factory to again enhance workers' capabilities — this time, by driving advances in computer vision and AI.

insideBIGDATA: Factory use of AI technology is gaining a lot of traction. How does Drishti use the commercial application of action recognition and AI innovations to automatically digitize human actions inside the factory? I would assume the resulting data set to be quite massive.

Prasad Akella: With 15 percent of GDP equivalent to $12T on the line, it's no surprise that practitioners of AI are targeting manufacturing, an admittedly unsexy backwater! Industry 4.0

has stirred excitement and action in the space.

Having said that, I'd like to take a bit of a detour and flag the obvious – that there are at least two big sources of data in the plant: human workers and machines. Interestingly, most of the efforts to date, including the huge investments in Industry 4.0, focus on the latter, for one main reason: Measuring what machines do is a whole lot easier. It's like the joke about the guy who just lost his contact lens in a dark alley looking for it on the corner, below the street light – because "The light is better here!"

This misplaced interest in machines runs in the face of some stunning facts: 90 percent of manufacturing is still powered by people! So, 90 percent of variation is introduced by these humans, even as they create 90 percent of the value. Which means that sans any knowledge of manual production processes, the digital transformation of manufacturing is a figment of someone's imagination!

Drishti is, therefore, focused on people, not machines. We digitize manual processes on the assembly line using computer vision and deep learning.

And yes, you're absolutely correct about the size of our data sets: They are orders of magnitude larger than simple textual data.

But it's not the size of the data set that's so important – it's the breadth. Currently, most manufacturers gather data on human operations by performing manual time and motion studies. They're essentially using the same techniques that were pioneered a hundred years ago by Frederick Taylor and Frank and Lillian Gilbreth in the time of Henry Ford. Manual data collection efforts are both unscalable and susceptible to human error.

What we're doing at Drishti is significant because we're accurately gathering data at a system-wide scale. And this data is being put to use in a number of important ways: First, it's given back to the operator to help him improve his performance to become more competitive against automation; and secondly, it's being given back to supervisors, engineers

and other domains in the ecosystem around the operator to help them find new ways to improve quality and productivity.

insideBIGDATA: How are manufacturers using Drishti? It is a matter of providing an anchor to digital transformation, driving improvements in productivity, quality and traceability?

Prasad Akella: While we've been hearing about digital transformation in manufacturing for a long time, the reality is that the vast majority of manufacturers still aren't truly digital. Even the more advanced companies who have pursued automation as much as possible aren't yet digitizing the actions of their human workers. Drishti helps manufacturers do exactly that, and that makes our technology the most logical anchor when pursuing digital transformation.

Drishti operates on the principle that humans will remain the primary driver of both value and variability on the factory floor for decades to come.

True digital transformation requires manufacturers to look beyond automation to enhance, support and measure the most central element of their operations: their human workforce. Drishti's focus on extending and analyzing human capability has the potential to drive sweeping improvements in productivity, quality and traceability for manufacturers.

Big Data has unlocked a lot of opportunity for manufacturers, and dramatically enhancing it with manufacturing process information about manual processes, computer vision, AI and machine learning provides new avenues of advancement. Suddenly, human action turns into data points, and data turns into insights. We're finding ways to pull information from sources that, until now, could never produce quantifiable data. So now the conversation shifts from automating that 90 percent of factory jobs that is being done manually – a monumental task that could take decades – to better understanding what's already being done in those roles at a more granular, actionable level.

insideBIGDATA: How are operators relying on Drishti? Is there an effort to become more consistent and efficient, becoming even more valuable on the factory floor?

Prasad Akella: Operators work in a challenging, variable environment; despite these conditions, there's constant pressure to improve their metrics. Too often, a lack of available talent leads to holes in the line, which puts more pressure on each individual operator to perform at maximum efficiency. Most operators will embrace technology that helps them do their jobs better, and Drishti has proven that it's up to the challenge.

There's a bit of a misconception in the media that operators in general are concerned about automation in the factory, because they're worried about losing their jobs to them. That isn't what we're seeing in practice – factory workers and plant managers alike are seeking automation that augments, not replaces, the human element. Drishti gives manufacturers a "second brain" or "third eye" to power them to higher throughput, better quality and more efficient results.

We've developed a man/machine interface that helps workers learn faster, perform more accurately and make fewer mistakes. Ultimately, we're going to lift the perceived ceilings on human productivity and provide workers with meaningful, valuable work that also benefits their company. It's a win-win.

insideBIGDATA: Can you describe how you're using AI, machine learning and computer vision to turn human actions into data?

Prasad Akella: We're deploying what may be the world's first commercial application of action recognition. Action recognition requires the machine to continuously observe a video stream and interpret actions that are taking place. Unlike object recognition, the current state of the art, which looks at a single frame and at <x, y> within the frame, action recognition requires examining <x, y, t> – a far more complex proposition. Not surprisingly, we're advancing the technology to a brand new level in deep learning and computer vision. In fact, our engineers are chomping at the bit to publish papers on the subject. Instead, we're patenting our technology and staying quiet about the technical details… for now.

insideBIGDATA: What is in store for the future with Drishti?

Prasad Akella: Drishti represents true digital transformation: taking something that was previously unmeasurable and bringing it into the digital world. We're continuing the progression from craft manufacturing to mass production to lean manufacturing, by putting lean manufacturing on steroids. To draw a medical analogy, it's like doctors going from stethoscopes to ultrasound machines to MRI and CAT scan machines each step up gives deeper insights and improves our ability to impact outcomes.

We're completely reimagining the way manufacturers do business, and soon you'll see the most forward-looking companies deploying Drishti as an integral part of their infrastructure, just as creform pipes are a part of the lean landscape. Further, they will realign their entire Kaizen process around these new datasets – using it to drive tens of percentage points of improvement and efficiency gains, not trying to eke out a basis point here and there. And,

perhaps most importantly, the potential of humans will continue to be realized in an increasingly automated world. That's the future we're poised to help manufacturers discover.

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