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POWERING IoT AND EMBEDDED INNOVATION

Computer Vision Turns Human Behavior into Actionable Data

Wherever you go these days, it seems you're always on camera. Whether in a shopping mall, subway station, or public square, a camera is likely pointed at you at least part of the time. But it's not just for security anymore; data collected from cameras increasingly is used to help make your life experiences easier and more enjoyable.

For instance, a transit system looking to ease congestion at rush hour may anonymously collect data on how many people stand on a platform or how crowded the subway cars get during that period. Using cameras with machine vision and AI video analytics, the transit system can act on the information by adding cars and adjusting schedules, with a deterministic method of confirming that changes improve the quality of service for customers.

On a factory floor, a manufacturer may collect statistics related to walking patterns of assembly line workers to understand how long point-to-point transit may take, or to simply help keep them out of danger around active machinery. It's easy to understand when machines start and stop, but it's much more difficult to accurately understand human physical behavior, especially as it relates to human-machine interaction. That is where computer vision and AI can come into play.

While being watched may sound creepy, the intent is good. And get this—neither the transit system nor the manufacturer needs to know who you are. When it's done right and in compliance with data privacy laws, data can be collected in such a way that can never be identified, and even if data is collected on gender, age, and accessories, the organization doesn't have to collect any identifying traits such as facial features and walking gait.

To do this, an AI-SaaS video analytics provider called C2RO created an AI video analytics platform for a wide range of industries—from public transit to retail to manufacturing.

Its platform ENTERA is designed from the ground up for data privacy compliance and leverages an organization's existing security camera systems. The software runs within the secure and private edge environment that is dedicated for video analytics. According to C2RO CEO Riccardo Badalone, it requires minimal, if any, hardware investment to deploy and produces highly accurate and fully anonymized data.

But what really sets ENTERA apart from other platforms is its ability to filter out any uniquely identifying personal data such as facial features or the way you walk. As such, C2RO fully complies with customer requests like this: "Tell us where our visitors go. We don't want to know who they are, but tell us where they're spending their time," Badalone explains.

"We never capture, collect, record or process uniquely identifying information. We don't use any information about how people walk or any other distinguishing physical feature. All data generated by the system is explicitly not derived from visitors' faces, therefore customers never have to worry about their personal information being retained for additional uses, there is simply no link to any personal information," Badalone says.

This frees organizations to analyze customer insights on user behavior and traffic patterns while complying with the strictest privacy laws such as Europe's General Data Protection Regulation (GDPR).

AI Video Analytics Reveals User Behaviors

Instead of uniquely identifiable information, ENTERA delivers insights on demographics. For instance, a shopping mall or retail store may want the age and gender of people passing through certain areas so it can plan targeted promotional displays to catch their eye or to maximize exposure.

Patented machine vision technology within ENTERA evaluates images in real time to generate fully anonymous metadata that is used to make determinations regarding traffic patterns and demographic attributes without relying on facial images or other biometrics.

Let's say a mall wants to better understand its foot traffic. AI models of ENTERA can determine the percentage of people simply walking through the property versus those who truly came for a purchase, how long customers tend to spend in specific areas, and what demographic group they represent.

"It highlights traffic patterns that are correlated to demographic groups, and this allows for A/B testing and performance tracking for any kind of marketing initiative," Badalone explains. "The analysis also extends to usage and interaction with new technology such as self-checkout systems and self-serve kiosks. By understanding the customer behavior in relation to the target initiative, businesses can design better and more targeted campaigns, giving visitors a more interesting and engaging experience. It's a win-win."

If a manufacturer wants to understand the aggregate movement of assembly line workers for safety and productivity reasons, fully anonymous and aggregated traffic patterns can be visualized and statistically analyzed using advanced visualization tools. Very often, statistical distributions of data collected over long periods of time will reveal occurrences of events that human spot evaluations won't catch. Preventive or proactive action can be taken to eliminate unsafe work patterns or bottlenecks in the production flow.

"Customers often find that their assumptions are challenged once they have access to consistent and reliable data. Once they are convinced the data is accurate, they often take very high impact action, which leads to big gains and ultimately produces the return on investment everyone wants," Badalone explains.

Customer Insights with Scalability and Reach

To make the technology even more attractive, C2RO ensures the platform will work with existing surveillance systems, even those with low-resolution and fisheye-lens cameras.

"If you tell a customer that already made a huge global investment in video security systems that they have to replace all those cameras with another, more expensive type of camera, there's no way they will adopt your technology," Badalone says.

Once the product was introduced, customers who wanted to use it in hundreds or thousands of sites started asking for scalability, according to Badalone. C2RO worked closely with Intel®, leveraging its chips and AI toolkit OpenVINO™ to achieve the performance and capabilities customers desired.

"We had this vision of ENTERA, which was going to be highly integrated, really powerful, but also cost-effective at scale for our customers," Badalone says.

Looking forward, Badalone says C2RO wants to make the platform fully software-defined so that capabilities can be added on demand by customers to further simplify adoption and create an environment where data analysis teams can collect data on a rolling basis where and when they need it.

Badalone envisions a future where AI training and system configuration is fully automated. "In the case of the AI learning, we want that to be completely abstracted, with no human intervention," he says.

Ultimately, the idea is to give a customer the flexibility to add and remove capabilities, and move the platform from one site to another without on-site installation. And that, he says, will inspire the customer "to rely on the data more, because they are always going to get a massive return on investment."