Next-generation tracking technology could be in your gadgets soon

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Sophisticated tracking technology, the likes of which you might associate with governments or big companies, may soon be in consumers' hands, homes, cars and local stores.

If it works as described - a big "if," of course, - the technology developed by a small-but-established U.K. company called Apical could detect not only people, but determine what they are doing, where they are going and even what they may be thinking. The technology, dubbed Spirit and part of the growing and fast-developing field of computer vision, could be used for everything from helping consumers shoot better videos to helping the local coffee shop improve its sales.

"What (the Spirit technology) is doing solves a lot of problems," said Mike Krell, an analyst at industry research firm Moor Insights & Strategy. "It could open up a lot of applications."

Scientists and companies have been making huge strides in computer vision and tracking technologies. Just last month, researchers at Google and Stanford separately announced they had developed software that allows computers to identify and even write a caption for what's happening in a scene. And for years now, consumers have been able to configure smartphones running Google's Android software to unlock their screens when they recognize particular faces.

Meanwhile, companies are becoming ever more sophisticated at tracking consumers' movements and gleaning data from them. A company called

Affectiva, for example, has developed a way of determining consumers' emotional states by monitoring their facial expressions with a simple webcam. Meanwhile, San Jose-based RetailNext has developed a system that combines data from video cameras, Wi-Fi antennas, Bluetooth beacons, cash registers and more to track consumers in retail stores.

Spirit represents another advance in the field, one that offers similar practical and consumer uses. According to Apical, the technology is powerful enough to track up to 120 people or moving objects at a time and glean their directions and intentions in real time. Unlike similar technologies, though, Spirit doesn't rely on powerful computers and doesn't need to transmit video to servers in the cloud. Instead, it can be built into the camera chips inside a smartphone or even a relatively simple webcam.

Generally, tracking systems try to glean information from video files, which means they have to process the video after it's recorded. By contrast, Spirit works independently of video. It takes a snapshot of a scene, but instead of recording pixel-by-pixel information such as color and brightness, it only records so-called metadata, such as the location, shape, trajectory and pose - how someone is standing or gesturing - of a particular person or object.

Because the system is recording much less information, the data can be used immediately. It also means that applications don't have to worry about storing or processing large video files or about how much bandwidth is available to transmit them up to the cloud.

"That's the essential difference," said Paul Strzelecki, a consultant who works with the company. "You've got to deal with the data at the edge and not create data" - like video - "that you don't need."

You may not have heard of Apical, but there's a decent chance that

you've used its technology. The company designs specialized processing "cores" for imaging chips that have been shipped in about a billion products, mostly smartphones, and have been licensed by Qualcomm and Samsung, two of the major manufacturers of smartphone processors.

The company was one of the pioneers of the high-dynamic range, or HDR, feature found in many smartphone cameras that helps them take pictures of scenes with a high contrast between light and dark areas. It also has developed a sophisticated screen-dimming technology found in Microsoft's Lumia phones that helps make them more legible outdoors.

One of the first places that Spirit is likely to show up is in smartphone cameras. Apical has developed a way of using Spirit to help consumers take better videos. The technology would maintain focus on a subject in a busy scene - say, of a child riding a bike in a park - and even automatically zoom in on the subject. At the same time, Spirit could be used to make it easier for consumers to find their videos later, by automatically tagging the video with pertinent information - not only the time it was taken and the location, but also what's happening and who's in the video.

That system could be in smartphones as soon as the end of next year. But Spirit may find its way into other products as well. The company is also exploring using Spirit in home-automation devices, in which the light might turn on or the TV volume might be automatically turned down when a particular person enters the room. Apical is also marketing Spirit to retailers, suggesting that it could allow them to present consumers with offers in real time on particular products based on what they happened to be looking at in the store.

And the system could have plenty of other applications. It could potentially be used in cars, to warn drivers about pedestrians near the road, or in security cameras to help identify actual threats.

"As with a lot of these things, the actual killer app will turn out to be something that's completely different, something that we weren't expecting," said Jeremy Green, principal analyst at Machina Research.