New 3-D sensors coming soon to computers, cameras, other gadgets

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In the science fiction movie "Minority Report," set 50 years in the future, Tom Cruise's character interacts with a computer display by moving his hands in front of it.

It won't take 50 years. Thanks to a promising new kind of image sensor, consumers may be interacting with computers and other devices in the same way in less than five years.

Image sensors are the light-sensitive computer chips inside digital cameras. Standard sensors essentially see and record flat, two-dimensional pictures. But a new generation can "see" in three dimensions, recording not only the image, but its distance from the camera.

That ability could have far-reaching implications. Among other things, it can allow sensors to track movements through three-dimensional space and to see images as three-dimensional objects.

One of the first consumer uses of these new sensors is likely to be in video games. At the E3 game conference last month, Microsoft wowed the crowd -- me included -- with its Project Natal technology that allows consumers to play video games just by moving their hands or kicking their feet. At the heart of Project Natal is a 3-D camera.

Such no-touch interfaces could soon show up in a lot more than just video game machines. In May, local startup Canesta demonstrated how a

similar interface could replace remote controls for televisions. Users could browse programs, change channels and raise or lower the volume by waving their hands.

Jim Spare, Canesta's CEO, imagines other applications as well. Replace the Webcam that has become a standard component in laptops with a 3-D sensor and you could control your computer by moving your hands in front of it. Do the same thing with the camera in smart-phones and you could go from touch-screen interfaces to no-touch ones.

Canesta designs and sells 3-D image sensors, so you'd expect Spare to anticipate all kinds of uses for them. But the company has some high-powered partners, such as Honda and Hitachi, that give credence to his vision. So does Microsoft's Project Natal, though Spare won't confirm whether Canesta's chips are part of that effort.

A number of companies and entrepreneurs have been working on three-dimensional image sensing for years. Canesta has been around since 1999. And Israel-based 3DV demonstrated a no-controller interface for video games in late 2007.

But Spare argues that Canesta has finally hit upon the technology to make such sensors commonplace. The company has developed a sensor that's built on just one microchip -- and a standard CMOS one at that. That means the sensors could be mass produced at a relatively low cost, making them feasible to use in a range of consumer gadgets and other electronic devices.

Spare expects Canesta's first 3-D chips to be used in industrial devices -- such as cameras that count prescription pills -- later this year. Consumer gadgets using the sensors should hit the market next year.

If Spare is correct, the sensors could be used in digital cameras to

enhance and speed up autofocus systems. They could be used in computers, coupled with facial recognition software, to authenticate and log in authorized users.

Perhaps most intriguing are their potential uses in cars. Some automakers have been placing ultrasonic sensors in the rear bumpers of cars to warn drivers when they are about to hit an object or a person. Canesta would like to see its 3-D sensors replace those ultrasonic ones.

The sensors may find a place inside cars as well. They could be used in place of weight detectors to determine if a child is in a seat and whether an air bag should deploy. They also could be used to detect when someone is inside a car when they aren't supposed to be, such as a thief or even a baby accidentally left behind by an absent-minded parent.

Maybe 3-D image sensors won't catch on as much as Spare and Canesta envision. I'm dubious, for instance, that a no-touch interface will replace the keyboard and mouse for the bulk of computer users any time soon.

Still, I see a bright future for 3-D sensors. And I, for one, can't wait until I can ditch my remote control and game controllers and enter the world of the "Minority Report."

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