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NATION AND WORLD

All-seeing computers proliferating

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The New York Times

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Hundreds of correctional officers from prisons across the U.S. descended last spring on a shuttered penitentiary in West Virginia for annual training exercises.

Some officers played the role of prisoners, acting like gang members and stirring up trouble, including a mock riot. The latest in prison gear got a workout. And at this drill, that includes computers that could see the action.

Perched above the prison yard, five cameras tracked the play-acting prisoners, and artificial-intelligence software analyzed the images to recognize faces, gestures and patterns of group behavior.

The computers cannot do anything more than officers who constantly watch surveillance monitors under ideal conditions. But in practice, officers are often distracted. When shifts change, an observation that is worth passing along may be forgotten. But machines do not blink or forget. They are tireless assistants.

The enthusiasm for such systems extends well beyond the nation's prisons.

High-resolution, low-cost cameras are proliferating, found in everyday products like smartphones and laptop computers. The cost of storing images is dropping, and new software algorithms for mining, matching and scrutinizing the flood of visual data are progressing swiftly.

A computer-vision system can watch a hospital room and remind doctors and nurses to wash their hands, or warn of restless patients who are in danger of falling out of bed.

It can, through a computer- equipped mirror, read a man's face to detect his heart rate and other vital signs. It can analyze a woman's expressions as she watches a movie trailer or shops online, and help marketers tailor their offerings accordingly.

Computer vision can also be used at shopping malls, schoolyards, subway platforms, office complexes and stadiums. All of which could be helpful — or alarming.

"Machines will definitely be able to observe us and understand us better," said Hartmut Neven, a computer scientist and vision expert at Google. "Where that leads is uncertain."

Despite such qualms, computer vision is moving into the mainstream. With this technological evolution, scientists predict, people will increasingly be surrounded by machines that can not only see but also reason about what they are seeing, in their own limited way.

The uses, noted Frances Scott, an expert in surveillance technologies at the Justice Department's research agency, could allow the authorities to spot a terrorist, identify a lost child or locate an Alzheimer's patient who has wandered off.

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