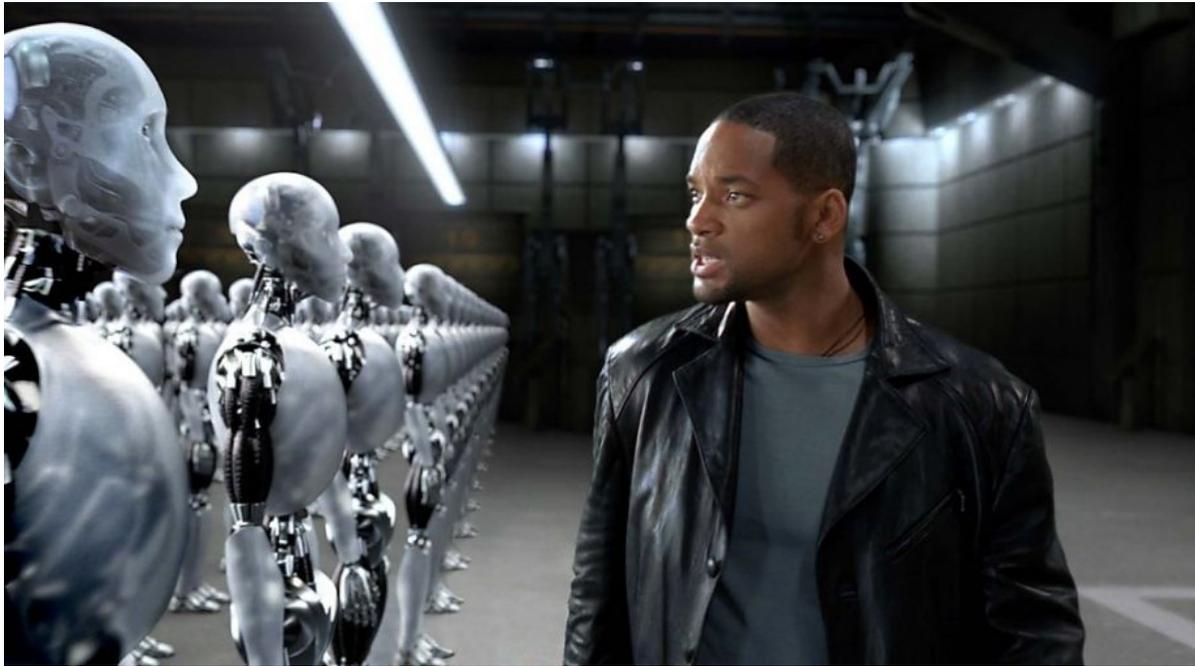


**SFGATE**<http://www.sfgate.com/opinion/article/The-robot-is-us-as-technology-expands-self-3000420.php>**OPINION**

## The robot is us as technology expands self

### TECHNOLOGY

David Peters Updated 4:04 pm, Tuesday, September 25, 2012



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**IMAGE 1 OF 4**

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In popular Western culture, robots of the future are often portrayed as a threat to humans. Whether humanoid ("I, Robot," NS-5) or Big Brother ("Terminator," Skynet), the idea of a nonhuman, calculating device with superpowers dominating our lives and threatening our existence makes for excellent drama.

In reality, there already is a robot to be feared in the world today. But its ability to perpetrate harm is entirely driven by humans. It is the military drone: an unmanned bombing machine operated from thousands of miles away. If you are an enemy of the state, your eyes are on the sky, filled with fear. Science fiction drama is reality.

Most people's idea of the robot is a human-like machine. In reality, a robot is any machine with motors that drive movement and a control system. Today, robots are all around us. The automatic parking system of a modern car is a robot. Sorting conveyors in commercial distribution centers are robots.

The Internet has rendered geographic location nearly irrelevant. Traditional distribution systems have been displaced by ubiquitous, inexpensive methods for the transfer of communication, data and entertainment. For years, the financial industry has systematically woven a powerful network that has nearly eliminated market provincialism. The unbridling of costly distribution systems has given rise to social networking, linking individuals without consideration to cost or physical distance. The individual has the means and the resources to build a network of shared interest around the world. The advent of the portable smart device has converted the Internet from the fixed to the mobile, continuously linking individuals. Web-accessible smart devices with sensors provide data that alter the way the world is perceived as access to stores of data improve individual comprehension or decision-making about circumstances beyond their own senses and knowledge beyond their own memory.

From finance to social to portable access: What is next? As machines continue to develop with embedded micro-processors, the economic value of their linkage via the Internet grows. The Web (or Internet) of Things improves user experience by providing remote control of the machines in our lives. For example, today we can control home security camera motion from our smart phones.

As this expansion continues, the Thing (that is, machine) connected to the Web (as separate from the person connected to the Web) will become more and more capable as embedded controls increase in power and sophistication. Actuation of the machine with sensors (think: robot), coupled with the smart device via remote control, will expand as economic opportunity justifies invention. Breakthroughs in embodied cognitive science demonstrate an inextricable link between physical body and thinking. Our methods for learning are bound and enabled by our physical self. As control systems begin to incorporate these discoveries, the seamless integration of the Web-tethered individual coupled with a sensing-actuated machine, will unleash a social/technological expansion of self. In other words, the remotely actuated machine will become the prosthetic extension of our identity. The machine as a prosthetic can do our bidding, provide assistance without our physical presence, and seamlessly

integrate with our sensing and action, redefining who we are. The actuated machine becomes the robot that is us.

As the political, social, emotional, legal and financial definitions of the individual expand beyond our bodies, notions of individual rights developed since the Middle Ages must change to accommodate the expanding control possessed by individuals. The paramount question becomes, in a distributed system of man/machine, where is the locus of control? Traditional ideas of geographically bound governmental systems, where power is partly defined by control of communication and location, are challenged.

We move into a future of uncertainty, where our greatest risk is ourselves. Technology continues to advance faster than we can construct systems to manage the risks. This has always been the case. Not until we understand impact through actual fact can we appreciate the implications. One thing is for certain: The robot will be an extension of us. And, good or bad, we know ourselves. If we are not careful, the question will become is this "1984" or "Brave New World"? It is time to consider a new model for technological development of robotics and smart devices, not just as tools that people control, but in an integrated manner, taking into consideration the social, cultural, legal and economic dimensions.

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