



AN INFUSION OF "GRAY-COLLAR" WORKERS

ROBOTS BECOME FAMILIAR PARTNERS IN THE WORKPLACE

Robots will become a familiar presence in the workplace of the future. A key driver will be the growing use of robots in teaching and education, which will pave the way for their assimilation into work teams. This will fundamentally transform the social relationships between people and robots, but not without risks; as Mitchell Resnick of MIT's Media Lab has said, "If kids grow up being taught by robots and viewing technology as the instructor . . . they will see it as the master." At the same time, dire forecasts of a robotic takeover of jobs are unfounded, as organizations will develop their "gray-collar" workforce only slowly.

UNDERSTANDING HUMANS: Work Habits and Social Protocols

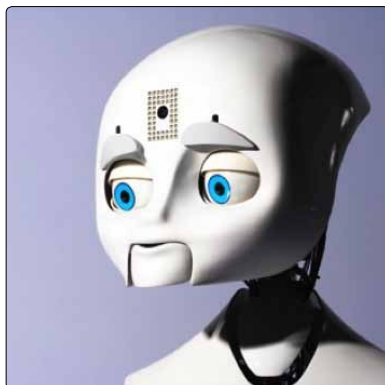
In order for robots to conform to human expectations and social protocols in the workplace, we will need to better understand and codify these parameters for ourselves. Robots will require on-site learning, behavioral adaptation, and reprogramming to help us match robotic and human work habits and encourage their acceptance within our organizations



Source: http://www.computerworld.com/s/article/9180781/Scientists_build_a_robot_that_can_learn_emotions

Emotional caregiving robots

Researchers at the University of Hertfordshire are working on a robot that will develop and express emotions to better fill caregiver roles as it interacts with people; the hope is that this robot can be a companion and caregiver to sick children.



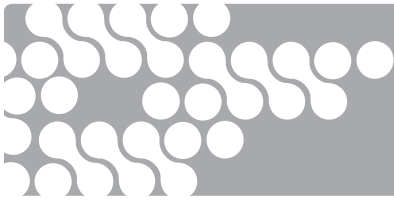
Source: <http://robotic.media.mit.edu/projects/robots/mds/overview/overview.html>

Mobile/dexterous/social robots

MIT Media Lab's Personal Robots Group is developing a team of small robots that possess a combination of mobility, moderate dexterity, and human-centric communication and interaction abilities, with the idea that they will work alongside humans.



THE FUTURE OF
HUMAN-MACHINE
INTERACTION



AUGMENTING HUMANS: Cybernetic Puppets

For the past few decades, robots have augmented humans in the workplace by providing superior strength, endurance, and precision. These qualities will continue to extend humans' capabilities, but as robots' own capabilities expand, they will come to complement humans in new ways—such as allowing us to interact with objects and other people at a distance. The robots' ability to interact socially means that humans will easily control a larger number of them, providing a “puppet-master” level of augmentation.



Source: <http://www.willowgarage.com/pages/texai/overview>

Telepresence robots

Willow Garage's Texai telepresence robot stands in for remote human workers so they can more fully interact with their colleagues in the office.



Source: <http://www.kivasystems.com/>

Robotic inventory management

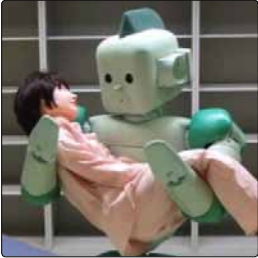
Kiva Systems' Mobile Fulfillment System uses a fleet of mobile robotic drive units to automate warehouse inventory functions under human supervision.



ROBOTS BECOME FAMILIAR PARTNERS IN THE WORKPLACE

AUTOMATING TASKS: Routine Service Jobs First

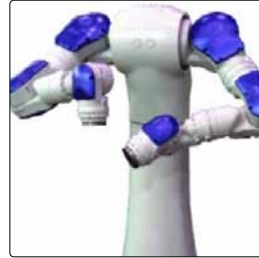
Robots will continue to replace humans in dirty, dull, and dangerous jobs because they will simply be able to do them more safely, more reliably, and ultimately at a lower cost. The real uncertainty revolves around how quickly robots will be able to replace humans in routine service jobs and even skilled positions.



Source: <http://www.neatorama.com/2006/03/15/ri-man-robot-for-the-elderly/>

Elder care

RI-MAN, the first robot designed to lift and carry humans, is under development in Japan and is intended to help with the care of the large wave of elderly over the next generation



Source: <http://singularityhub.com/2010/08/19/motoman-robot-dresses-up-and-serves-ice-cream-in-tokyo-theme-park-video/>

Robotic waiters

A Motoman robot is serving ice cream to thousands of patrons a year in Japan's Summerland Theme Park as a way of exploring and promoting robot-centered business models.



Source: <http://www.engadget.com/2005/12/01/in-the-skys-sora-a-receptionist-robot/>

Robotic receptionists

A Japanese company has developed a robot called SORA to automate many of the tasks of a receptionist.

FORECAST

The economic incentives to introduce robots rapidly into a far greater number of human occupations will become irresistible over the next decade, especially in industries where productivity gains have faltered and led to rising costs, such as health care and education. New robotic capabilities that mimic human physical, emotional, and social skills will create the opportunity for robots in many forms to work alongside humans. But the transition to hybrid human-robot teams and organizations may create friction that will take many decades to play out.

(1) A segregated gray-collar workforce

In some cultures, industries, and workplaces, we will see the emergence of a distinct gray-collar workforce: a robot labor force segregated from humans.

(2) Robots masquerading as humans

In order to fit into slow-changing workplace cultures, robots will have to be dressed up in sheeps' clothing (so to speak!), wearing the vestiges of human emotional and social behavior to fit in.

(3) Robot resource management

As we struggle to figure out what makes good leaders of people, we will also need to understand the skills required to manage a gray-collar or a mixed human and robot workforce.

(4) Organized resistance to robot replacement

There are already signs of organized resistance to widespread replacement of human workers by robots. As the economic impact of these changes is felt, and inevitable mistakes are made by robot workers, this resistance will become even more forceful and effective.



WHY IS THIS IMPORTANT?



Robots will provide a more human way than computer terminals of integrating the capabilities of artificial intelligence into work teams. As the benefits of this approach take hold, the economics of replacing human workers with robots will be irresistible in a growing range of occupations. Over the longer term, massive tensions will likely arise as humans struggle to integrate more and more capable robotic colleagues into the workplace.

RESOURCES

- The special report “CEO Guide to Robots in the Workplace” (Bloomberg *Businessweek*) is a good overview of robots currently being used in various workplaces and occupations. http://www.businessweek.com/technology/special_reports/20100601ceo_guide_to_robots.htm
- *How to Fight Back Against Robots in the Workplace* is a farcical guide to fighting back against “job-stealing robots,” but it illustrates the many frustrations and challenges involved. http://www.ehow.com/how_2181651_fight-back-against-robots-workplace.html
- “The Changing Role of Robots in the Workplace” is a transcript of a segment of PBS’s *Nightly Business Report* exploring how robots are transforming logistics and creating new management challenges. <http://www.pbs.org/nbr/site/onair/transcripts/061106e/>
- “The Telepresence Robots Are Coming” by Daniel Terdiman (on his blog, geek gestalt) is a survey of how robots can extend and augment the capabilities of our broadband communications tools. http://news.cnet.com/8301-13772_3-20005219-52.html



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