OXFORD LIBRARY OF PSYCHOLOGY

Editor in Chief PETER E. NATHAN

The Oxford Handbook of Affective Computing

Edited by

Rafael A. Calvo

Sidney K. D'Mello

Jonathan Gratch

Arvid Kappas

OXFORD
UNIVERSITY PRESS

2015

CHAPTER

9 Affect and Machines in the Media

Despina Kakoudaki

Abstract

This chapter traces literary and cinematic representations of intelligent machines in order to provide background for the fantasies and implicit assumptions that accompany these figures in contemporary popular culture. Using examples from media depictions of robots, androids, cyborgs, and computers, this analysis offers a historical and theoretical overview of the cultural archive of fictional robots and intelligent machines—an archive that implicitly affects contemporary responses to technological projects.

Key Words: robots, androids, cyborgs, computers, artificial people, intelligent machines, popular culture, literary and cinematic representations, media depictions, fictional robots

Reality and Fiction

Long before they became possible in technological terms, intelligent, responsive, and even emotional machines featured prominently in the popular imagination, as well as in literature, film, drama, art, public discourse, and popular culture. While contemporary research aims to create the basis for better communications and denser interactions between people and advanced applications in robotics or computing, fictional and representational media depict intelligent machines and human-machine interactions through long-standing patterns and stereotypes that remain independent of the current state of scientific knowledge. Despite their unreality, fictional entities such as the robots, androids, cyborgs, computers, and artificial intelligences of science fiction and popular culture channel a range of feelings about technology and partly inform contemporary expectations and assumptions about what robotics applications would look and act like and what they would do.

It is especially important for researchers and scientists working in robotics, automation, computing, and related fields to recognize the potential interaction between fictional intelligent machines and actual research. Our collective cultural literacy about the fictional robot or android may be implicit or unconscious, or it may become visible in everyday fascinations with the figures and images of popular culture as well as beloved characters from science fiction literature and film and their funny or campy bodies and behaviors. Children can define and draw robots long before they are old enough to read a science fiction story or watch a relevant film; collectors of all ages gravitate toward both high-tech and retro robot toys; television advertisements promote innovation or just novelty through images of future robotics; and cinematic characters such as R2-D2 ad C-3PO, the robots of *Star Wars* (George Lucas, 1977), are as familiar as folk figures, their bodies and voice patterns instantly recognizable around the world (Figure 9.1. Researchers who work on designing emotional or intelligent machines share this cultural archive with everyday users of their applications. It is thus essential for them to become conscious of the fictional tradition, both in order to be able to identify how their own cultural assumptions and unconscious expectations may affect their

research and to anticipate or interpret the reactions of their prospective users to new technological constructs. Although it may seem that fictional robots have little to do with contemporary scientific and theoretical debates and the high-tech tenor of robotics research, a closer look at this relationship reveals that fiction and reality are intertwined in important ways.

This chapter aims to provide an approach to this cultural archive of assumptions and expectations through a brief overview of the main texts that have contributed to its formation in fiction, film, and popular culture. Precisely because they are so pervasive and familiar, fictional robots function as mental, psychological, and cultural benchmarks for robotic presence—benchmarks that actual robots and robotics projects might strive to reach or evoke, even implicitly. When we discuss robots in the public sphere today, we combine our understanding of actual robotic applications in universities, research teams, and companies around the world, as these are becoming increasingly familiar to a mainstream audience, with our implicit sense of imaginary and fictional robots. Indeed, while contemporary research promises to transform our interactions with machines by allowing the machines themselves to become more responsive, this promise draws part of its emotional and cultural power from literary and cinematic traditions that have little to do with technological possibility. As a result of this paradigm meld, real robots are inseparable from their imaginary counterparts, since it is often the fictions that supply the emotional and intellectual context for much of the robot's cultural presence. As an imaginary entity, the fictional robot is so evocative that it sets the tone of our expectations from future robotics research and technological actuality.

In order to be able to distinguish the cultural influence of the fictional traditions of robotic presence, we first need to identify the ways in which contemporary technoculture criticism and popular writings on technology tend to use elements from this tradition, utilizing our sense of the aims, appearance, and functionality of fictional robots and other intelligent machines in order to explain or popularize actual research (Menzel and D'Alusio, 2001). The rise of technological discourse in the humanities, social sciences, and cultural criticism in the 1980s and 1990s was partly inspired by Donna Haraway's conceptualization of the cyborg as a theoretical entity (1985/1991) and expanded after N. Katherine Hayles (1999) described post-Enlightenment philosophical tendencies through the concept of the posthuman. These approaches brought new interest to the intersections between science and culture but also made

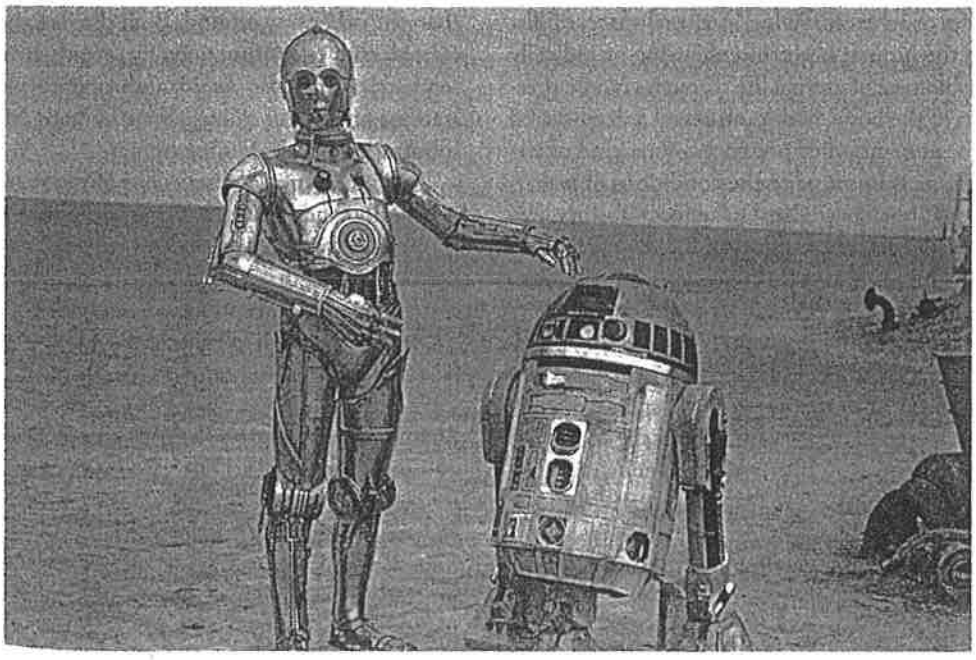

Fig. 9.1 R2-D2 and C-3PO, the expressive robots of Star Wars (George Lucas, 1977).
Credit: Twentieth Century Fox/ Photofest. © Twentieth Century Fox.

important connections between imaginative fiction and contemporary technological and critical contexts (Gray, Figueroa-Sarriera, and Mentor, 1995; Milburn, 2008). Cyborg criticism often resolves the paradoxical connection between real technologies and the imaginary presence of figures such as robots and cyborgs by focusing not on the depiction of such entities in fictional texts and films but on their potential as concepts that represent current modes of technological embodiment. Cyborg criticism tends to avoid the fantasmatic presence of fictional intelligent machines, emphasizing instead the ways in which our technologies are literally transforming us into hybrid technological beings, changing the ways in which we relate to our bodies, experience our environment, and communicate with others.

Popular writing about future technology is also characterized by an ambient and pervasive sense of apocalypticism. Writers such as Ray Kurzweil (2000) propose a "transhuman" future in which advanced technologies help people overcome the limits of the body or the self, while Hans Moravec (2000) offers visions of the evolution of robotic intelligence. While some of this work is based on contemporary technology and research and helps popularize questions of machine intelligence, nanotechnology, and biologically based systems research, it also presents heroic or exaggerated visions of science and traffics in transcendentalist notions. Fantasies of uploading one's consciousness into networks or databases, of memories or selves surviving in virtual space, of discarding the human body, of enhancing or radically altering biology, of eternal life through cryonic preservation of the body, and so on reveal a deep-seated desire for nonembodied presence—for a kind of virtual self that is immune to the conditions of reality.

Such approaches also, in effect, absorb elements of the science fiction tradition, which they transpose into a future reality of robotic evolution, robot-human competition, and an increasingly robotized or instrumental world—a world that they do not necessarily critique or problematize. In science fiction, stories that present the cryonic preservation of the body emerged as early as the end of the nineteenth century, while notions of enhancing the human body through technological means so that it could survive in space and on other planets appear in fiction throughout the twentieth and twenty-first centuries, often presenting accurate visions of cybernetic transformation, as in Frederick Pohl's *Man Plus* (1976/2011). Jacked-in and virtual selves are a staple of science fiction writing and feature prominently in cyberpunk work by writers such as William Gibson, Bruce Sterling, Pat Cadigan, and Neal Stephenson (McCaffery, 1991). In fact, science fiction literature often offers a more serious exploration of contemporary conditions of technological possibility and future trends than many popular technoculture works presented as nonfiction. Current science fiction explores biotechnology and genetically engineered crops and animal species, as in Paolo Bacigalupi's *The Windup Girl* (2010), with deep awareness of the far-reaching implications of contemporary experiments and debates.

In contrast to the desire for disembodiment implicit in transhumanist research, current research in robotics accentuates the importance of situated and embodied knowledge. Rodney Brooks (2003), for example, alerts us to the potential of designing with an eye to specific and practical robotics applications, learning from the natural world and from biological organizational principles. His ideas about swarms of robots, to name one strand of his work, are based on observation of insect activities (Figure 9.2). Instead of positing that a robot has to have a cognitive mapping of the world or that it must possess some aspects of will and judgment before acting, Brooks offers a profound insight about how simple and specific actions conducted in programmed sequence can become effective on a larger scale.[1] Action and cognition are embodied and interrelated in this approach; in fact, it may be action that predates or inspires cognition rather than the other way around. Both the design of such robots and their functionality avoid apocalyptic tendencies and also avoid anthropomorphic stylizations and grand claims about humans becoming robots or robots becoming human.

In popular media, discussions of robotics tend to mix fiction and reality, to present unchallenged continuities among ancient and premodern inventions; fictional, imaginary, and cinematic robots; and actual contemporary robots. Time lines that trace a prehistory for modern robotics may include a range of older mechanical contraptions, from the ancient pneumatic automata of Hero of Alexandria in the first century CE—which used liquids, pressure, and steam in order to open doors or move objects in secular and religious settings—to the famous eighteenth-century performances of complex human-form clockwork automata that could play musical instruments, draw, and write. In addition to objects with legitimate links to technological processes, some of the artifacts included in such listings may be mythical or apocryphal, their technological properties having been exaggerated or misreported.

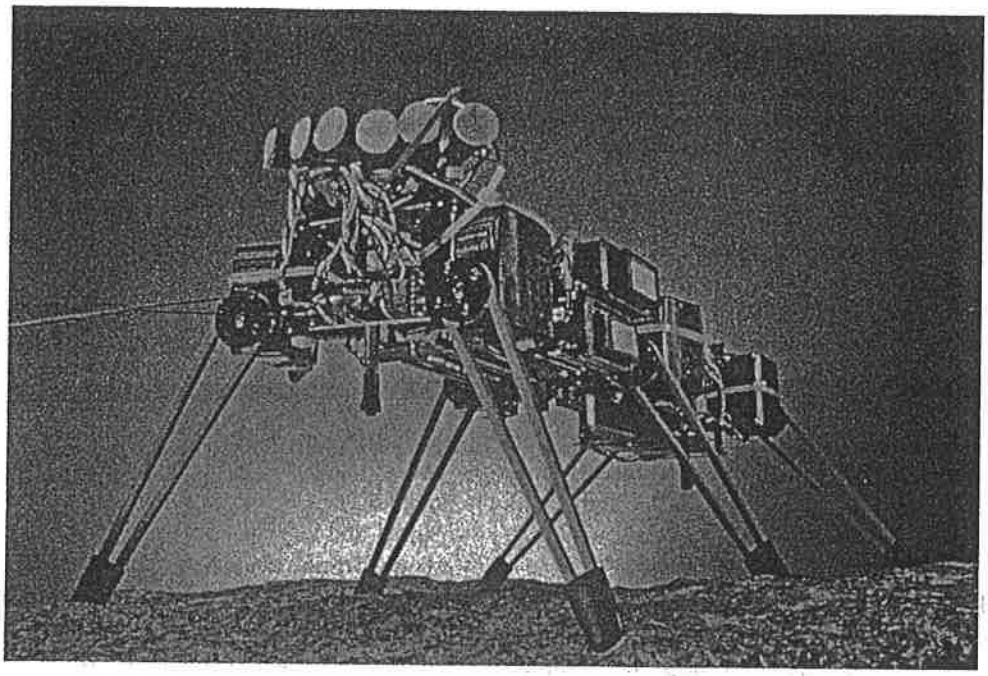

Fig. 9.2 Robot designed by Rodney Brooks, featured in the documentary *Fast, Cheap & Out of Control* (Errol Morris, 1997). Credit: Sony Pictures Classics/Photofest. © Sony Pictures Classics. Photo: Nubuar Alexanian.

Historians of science strive to complicate these approaches by exploring the relationship between premodern and modern approaches to the concept of artificial life (Kang, 2010; Riskin, 2007). Despite extensive contextualizing work in the history and theory of science, popular media insist on grand and often unexamined genealogies. The cumulative effect of this approach is that any number and type of entities may be presented as precursors of modern robots; this creates a problematic teleological tendency in which earlier experiments and historical contexts are either misunderstood or discussed as if they had all clearly led to the current state of robotics. The result is an often anachronistic and ahistorical tendency to describe all kinds of premodern and early modern myths, fictions, allegories, and technological processes as if they were contributing to an eternal dream, the dream of creating artificial life through technological means. Although pervasive and resonant in modernity, such notions of artificial animation are very different from their ritual and mythic counterparts of earlier eras.

In mainstream media we also see the tendency to publicize popular research projects, high-profile robot prototypes and robotic toys, in order to promise the future development of actual work-related robots, all the while mostly ignoring many practical applications as well as the industrial robots in existence today and industrial robotics as a marketplace. Popular publications favor apocalyptic claims and anthropomorphic designs that operate in an implicitly gothic continuum in which robots are designed as imitations of human form and performance. Despite the fact that they get a certain amount of attention from the popular press, some of these projects must be recognized as being artistic and sculptural rather than robotic, closer to long-familiar puppets, animatronic structures, and remote-controlled dolls than to contemporary computing. Many are public relations events in which a specialty robot promotes the research aspirations or capabilities of a particular company without necessarily representing these capabilities in technological terms. Actual industrial applications that do not conform to such anthropomorphic performance tenets also get less public exposure despite their importance and efficacy. Automotive factories have long been radically automated, robots are central to packaging and palletizing industrial processes, while robotics and automation applications in materials handling are changing the way research in biotechnology is conducted.[2] Despite the precision and versatility of these applications and their potential for revolutionizing research and industry, such real robotic innovations are less familiar to the general public.[3] Depictions and performances of symbolic

robotics appropriate the popular meanings of "the robot"—as these have been defined over time by fiction, film, and popular culture—in ways that actual robotics usually do not.

For research in affective computing, the tendency to mix fictional and actual research and to interpret ancient and premodern experiments as tokens of an unbroken focus on artificial bodies, artificial life, or robotic futurity confuses the issue of how to distinguish the fictional power of robotics fantasies from the everyday power and potential of human-machine interactions in real-world contexts. Tracing the fictional tradition in a more self-conscious way instead allows us to recognize the ways in which the contemporary vernacular may miss the point of what robots embody, both in fiction and potentially in reality.

Intelligent Machines in Science Fiction

In many ways, robots, cyborgs, and androids are the latest products of a transhistorical trend in human culture, a fascination with imagining the animation of artificial bodies that characterizes both modern and ancient myths and texts. Some ancient origin stories indeed depict the creation of people as such a scene of animation, in which an inanimate body—made of clay, earth, stone, wood, and other natural materials—is animated by gods through their own breath or touch but also through fire, incantations, divine body fluids, or other mysterious powers. Later stories return to the patterns of ancient animations and warn of the dangers of such processes when they are disconnected from ritual settings and spiritual discipline. In golem stories for example, a rabbi or group of initiates may animate a man of clay through incantation and ritual, but they may lose control of this supersized servant if they do not follow precise instructions (Baer, 2012; Idel, 1990; Scholem, 1996).

Modern stories and films depict similar animating scenes, orchestrated by aspiring scientists or mystics, and featuring bodies made of deceased body parts, metals, plastics, complex electronic circuitry, or mysterious "positronic" brains. It is important to note that modern animating scenes usually avoid natural materials such as clay, wood, or stone, instead displaying a preference for human and animal body parts, as in the case of the creature in Mary Shelley's *Frankenstein or The Modern Prometheus* (1818), as well as technological materials and mechanical and electric processes. Victor Frankenstein's monster in the novel is composed of scavenged human and perhaps also animal remains, while his stitched-together supersized body is animated by an undisclosed process that later texts and films translate into electrical spectacles powered by lightning. Partly alchemical or apocryphal, the process by which the monster is animated remains mysterious and invisible in the novel, although it has become increasingly visible, visually spectacular and technological as the book was adapted for visual media, first for the stage and then, repeatedly, for cinema. Early film depictions of animation, as in the expressionist film *The Golem* (Paul Wegener, 1920), may follow a mystical and alchemical visual vocabulary, while the classic film *Frankenstein* (James Whale, 1931) presents a more overtly technological view of the animating process, devoid of magical and kabbalistic symbolism despite its own pseudoscientific bubbling liquids and electrical spectacles. The monster's physicality and the scenes of the monster's animation in *Frankenstein* are in many ways foundational for later visual representations of artificial life (Figure 9.3).

Shelley's novel offers an evocative portrait of an artificial person's experience in the monster's awakening and education, his quest for recognition and acceptance, and his constant rejection by the people around him. Partly because of its fractured and complex point of view, the novel remains pivotal for later narratives of artificial beings and for the kinds of emotions we associate with artificial life. The monster's violence anticipates depictions of violent robots, while his quest for acceptance resonates with existential narratives of artificial people in the twentieth and twenty-first centuries. Contemporary critical approaches to the novel also complicate the popular stereotype of Victor Frankenstein as a hubristic or "overreaching" scientist: despite its currency in popular culture, this depiction of Victor as a man who aims to play God does not occur in the novel's first edition, published in 1818. Mary Shelley added a moralistic thread of commentary to the agnostic tone of the novel when she revised the book for the 1831 edition, and most of the passages that characterize Victor's quest as unholy or sacrilegious stem from these revisions.[4]

It is important to remember that if one aspect of the novel's poignancy revolves around scientific aspirations and unforeseen results, a second aspect, equally important, revolves around the novel's depiction of social exclusion and injustice. In the novel, the monster is an eloquent and forceful critic of the limited ways in which humanity is defined, while in later theatrical and cinematic adaptations

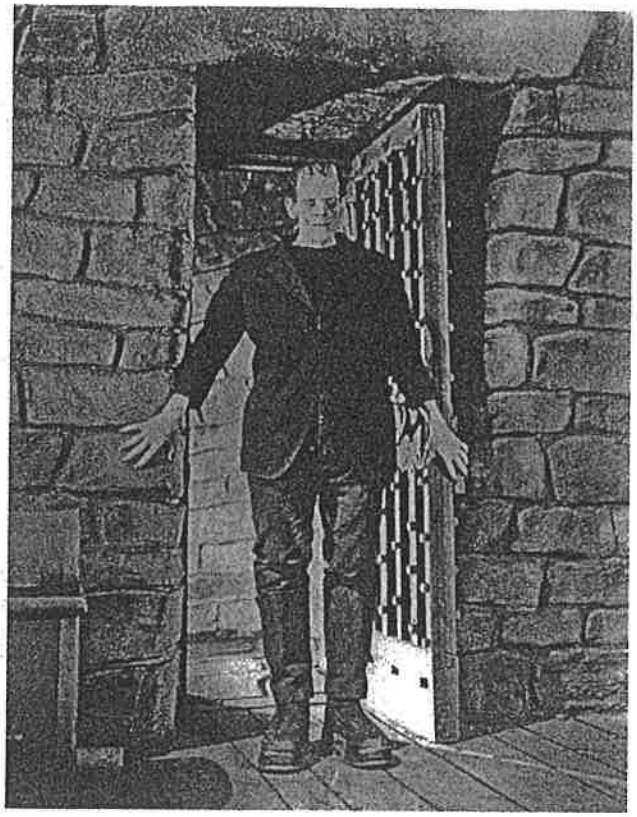

Fig. 9.3 Publicity materials and popular culture stereotypes highlight the iconic physicality of the monster (Boris Karloff) in *Frankenstein* (James Whale, 1931). © Universal Pictures.

the monster is silent, a hulking form of surprising emotional sensitivity. Although the stereotypical treatment of the monster in popular media may begin from people's fear of his radical otherness, he is in fact a very sympathetic character. The affective power of the monster in popular culture hinges on depictions of his silent pathos, which become recognizable as registers of the creature's disenfranchisement and abuse despite the absence of the fiery rhetoric and sustained ideological critique of social injustice we find in the novel. The monster's silence and his embodiment of abjection resonate with long-standing sentimental and lyrical traditions, in which giving voice to inanimate or mute entities occasions powerful emotional responses for readers or viewers. In the 1931 film, scenes of persecution, in which the monster is confused, lost, hurt, or hunted, may be followed by scenes of silent longing, in which the monster responds to music or beauty or seeks understanding with children, whose innocence matches his own (Figure 9.4). Despite his uncanny appearance and his potential for violence, the monster remains a creature of sympathy for most of the film, as the viewer's allegiance shifts from the human characters to the nonhuman but understandable and even archetypal pathos of the abused and rejected monster.

As an entity in contemporary culture, the mechanical person or robot emerges in a multitude of texts and films in the early twentieth century. In addition to figures we might recognize as precursors, such as the Tin Man from L. Frank Baum's Oz stories originally published in the 1900s, it is in the 1920s that robots become vernacular, emerging in Karel Čapek's 1921 play *R.U.R. (Rossum's Universal Robots)*. The internationally successful play introduced the term *robot*, from the word *robota*—which means "work" in Slovak and "forced labor" in Czech—to describe the androidlike manufactured workers of the Rossum factory. Designed as perfect servants and workers, cheap, efficient, and expendable, the Robots (which Čapek capitalizes) eventually revolt, kill the engineers who designed them, and destroy human civilization. Spectacles of mechanization and modern life also emerge in Fritz Lang's *Metropolis* (1926) and its stirring images of the animation of an artificial person, a

Fig. 9.4 Two kinds of innocence: the monster (Boris Karloff) and Little Maria (Marilyn Harris) in *Frankenstein* (James Whale, 1931). © Universal Pictures.

robotic woman who acts as an agent of disorder but also represents sexual energy and primitive passion (Elsaesser, 2008; Huyssen, 1982). The film engages a visual and narrative vocabulary of revolution: The oppressed workers of Metropolis are depicted as little more than cogs in the giant machinery of the city, figuratively devoured by the machines they operate. Stirred into revolution by the robotic Maria, who acts as a provocateur, the workers unleash incredible violence until the rulers of the city agree to a new balance of power. In the allegorical language of the film, compassion—the heart—brokers a new unity between capital and labor, between the brain and the hands. Both *R.U.R.* and *Metropolis* depict robotic beings that embody our cultural fascination with machines even as they allegorize or bemoan the position of the worker in industrial capitalism.

By the middle of the 1930s, robot figures play the roles of both golemlike protectors and terrifying enemies. Classic robots are often imagined as having metal bodies and electronic (or "positronic") brains, no capacity for emotion, and little social and cultural understanding. The quintessential robots of Isaac Asimov's *I, Robot*, a series of short stories written between 1940 and 1950, are oversized, metallic, superlogical, unemotional, and generally clearly nonhuman despite their attempts to make a logical claim to human status. Robots are often depicted as supersoldiers, superworkers, or superslaves, as their exaggerated body stature, association with industrial and military environments, and material connections to machinery and metal surfaces evoke a nineteenth-century "cog and wheel" aesthetic. On more intimate terms, robotic bodies are characterized by an absence of or even an aversion to body fluids, emotional attachments, and sexual experience. In addition, mechanical bodies implicitly propose that compartmentalized functions and replaceable body parts render one invulnerable or provide an antidote to death. The classic robot's usual dependence on logical propositions and explanations extends this desire for compartmentalization to language as well.

Despite the presence of advanced electronics in robot stories, our fascination with classic robots pivots on their mechanical presence—their bodily otherness. Beloved film robots, such as Robby in *Forbidden Planet* (Fred M. Wilcox, 1956), or Gort in *The Day the Earth Stood Still* (Robert Wise, 1951),

are recognizable and familiar in their trademarked body presence. The emphasis on exaggerated stature and metal surfaces has been replaced in recent years by smaller robot styles and new materials, but the association with overt technological registers persists. In the recent film *I, Robot* (Alex Proyas, 2004), for example, the robots are depicted through a material vocabulary of translucency, white plastic surfaces, and ethereal blue lights—a vocabulary that directly evokes the design of Apple Computers. Both old and new aesthetic traditions are also present in *WALL-E* (Andrew Stanton, 2008), with one robot, WALL-E, rendered in a dirty and dingy version of the traditional industrial paradigm, while the other, EVE, embodies the ideals and pleasures of contemporary design, its seamless opacity contrasting sharply with the rivets and joints of WALL-E's classic industrial looks.

What is most important to note about the narrative and visual patterns of representing intelligent machines is that they align visual representation with narrative function. What a certain type of artificial person can do or evoke in a text is closely related to how this being looks and is represented visually. The issue is not whether artificial people succeed or fail based on their successful imitation of human appearance but that each type of visual and physical depiction has certain associated fantasies and capacities. The robot's body type structures the text, in other words. For example, the design of classic robots externalizes an important relationship with industrial technology, and insists on establishing visually the distinction between human and nonhuman status. Even when a text shows a narrative investment in transcending this boundary, the visual and material choices of robot stylization often offer an intuitive solution to the problems of distinction. We see this pattern in *The Bicentennial Man* (Chris Columbus, 1999), the film based on an award-winning novella by Isaac Asimov (1976). Andrew, the robot protagonist, fights for 200 years to acquire a series of rights, such as the right to own his own labor, to wear clothes, to own property and so on. Regardless of the sympathetic tone of the text and despite the consistent focus on rights rather than ontological categories, Andrew's metal exterior offers an easy and intuitive distinction between people and robots for the audience: We cannot help but recognize immediately who is what. Indeed, the robot's visible difference registers everybody around him as more clearly and reliably human (Figure 9.5). It is only after Andrew undertakes to modify his own body to become more humanlike that he is even marginally eligible to acquire full human rights. Both his exterior appearance and his interior organs are gradually transformed, and in

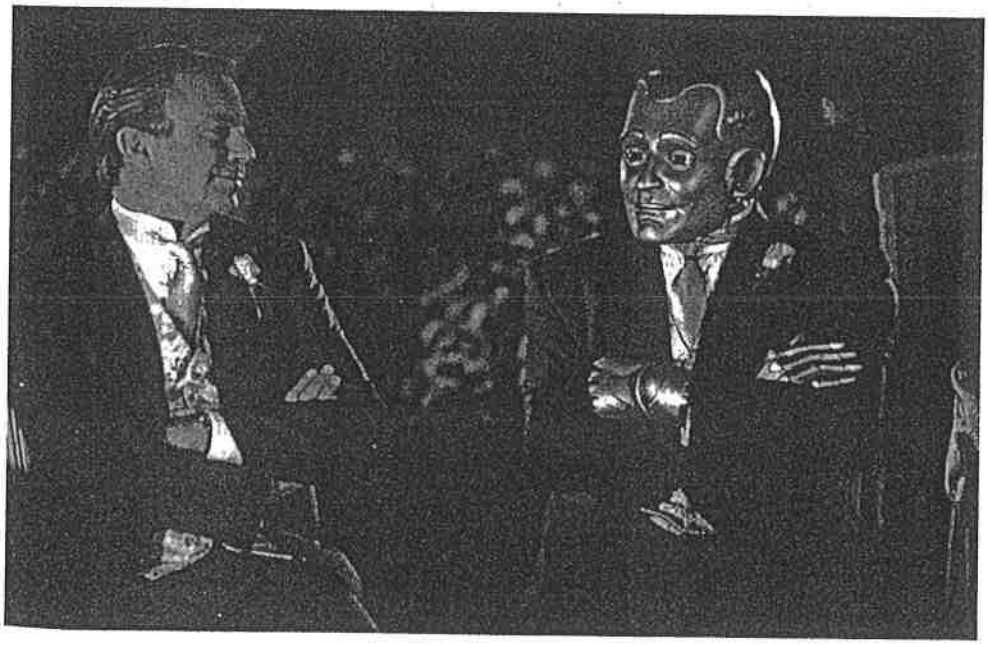

Fig. 9.5 The contrast between human and robot in *The Bicentennial Man* (Chris Columbus, 1999). Even after the robot Andrew (Robin Williams) has acquired the right to wear clothes, he is clearly distinguishable from his human owner, Richard Martin (Sam Neill). Credit: Buena Vista/ Photofest. © Buena Vista Pictures.

the end he decides to allow his body to decline so that he will fully qualify as human as he dies.

When they are depicted as metallic or oversized, robots cannot "pass for human," and passing for human is a recurring textual element in stories that feature artificial people. While marginally more passable in terms of their humanlike exterior, androids are similarly distinguishable from the human norm. One could argue that robots and androids are "born" together and share similar limitations, since Čapek's *R.U.R.* depicts mechanical beings that are technically androids. Humanlike in their general physicality, the artificial people of *R.U.R.* display verbal rigidity, and stilted, mechanical body language—behaviors that differentiate them from the human norm. Since then, the physical depiction of androids has included a mechanical or electronic interior covered by a layer of latex, artificial skin, or other material that gives them a humanlike exterior. But the androids' often unnatural skin tone, lack of facial expression, rigid body language, and overall demeanor still render them clearly *other* in many texts. Androids are often inept at dealing with humor, emotion, sexuality, and human culture in general and have trouble with ethical dilemmas.

Traditionally, fictional robots and androids are often designed as artificial servants, soldiers, or workers. In the Čapekian vein, such robots are poised to revolt and overturn the social status quo, functioning as figures of a repressed proletariat or slave worker class. In the Asimovian vein, such revolt is thwarted by the design of robots with built-in ethical safeguards, superlogical intellectual styles, and limited initiative. Asimov's "Three Laws of Robotics," now widely but unevenly dispersed in contexts other than science fiction, offset an imagined amplification of robotic action and autonomy with the assurance that such power would not be used against human life. Although aspects of the "Three Laws of Robotics" are mentioned in earlier stories by Asimov and other writers, Asimov articulated their generally accepted form with John W. Campbell, then editor of *Astounding Science Fiction*, and included them for the first time in the 1942 story "Runaround."[5] These laws are as follows:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

In his Foundation novels of the 1950s, Asimov eventually also added the "Zeroth Law," which partly allows a robot to harm a human in the service of a more abstract notion of humanity. The law was eventually expressed as: "0. A robot may not injure humanity, or, through inaction, allow humanity to come to harm."

While the two modes of imagining robots, as enemies or as helpers, often complicate each other, they can help to identify dominant styles and preoccupations in different historical periods of the last fifty years. While robots in science fiction often express existential concerns, becoming vehicles for evocative and poignant explorations of what it means to be human or nonhuman (in the Asimovian tradition), the ominous robot or cyborg that is running amuck and is about "to get us," echoing some of Čapek's concerns, has also enjoyed widespread appeal throughout the twentieth and twenty-first centuries (Telotte, 1995). Visual representational styles contribute to such variations. After the 1980s, for example, fictional robots were often depicted as more humanlike, with synthetic skin and eyes and a human demeanor, but they were also more violent. In science fiction films of the 1990s, cybernetic entities that combine computer-related intellectual power with robot-related mechanical and metallic interiors and a humanlike visual presence are depicted as more dangerous and ominous because of their hybridity. They can think and act autonomously, pass for human, and still possess the mechanical qualities of the unfeeling and indestructible imaginary robots of long ago.

Memorable android characters such as Commander Data (Brent Spiner) on *Star Trek: The Next Generation* (aired 1987–1994) embody the combination of anthropomorphic aspirations and subtle visual distancing that characterize android representations in general. Commander Data is portrayed with an unnatural skin tone, yellow eyes, and a special kind of gaze, inquisitive but also impassive and impersonal (Figure 9.6). Despite his success in the Fleet, his long-lasting friendships and insightful cultural interpretations, he always remains somewhat removed from human status. In a sustained narrative strand that recurs throughout the seven seasons of the popular series, Data's poignant quests to understand and attain full humanity reveal the ever more subtle ways in which humanity is defined

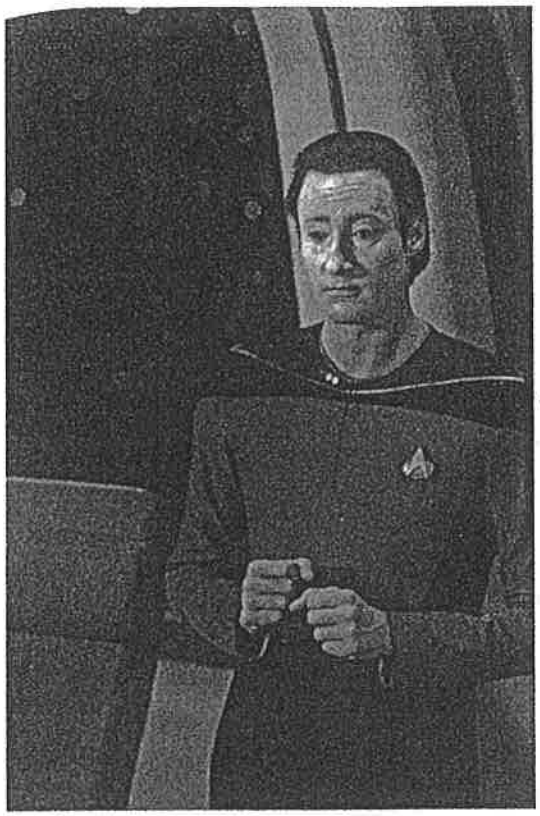

Fig. 9.6 Commander Data (Brent Spiner) in *Star Trek: The Next Generation* (Season 2, 1988–1989).
Credit: Paramount/Photofest. © Paramount.

as being beyond his reach. And in contrast to the expressive simplicity and matter-of-factness of most classic robots, Commander Data experiences his difference from humans with some wistfulness. He is aware that it is precisely in terms of emotion and affect that he differs from people, and he often tries to intellectualize, abstract, or just plainly imitate the emotions that he lacks. Humanity in this case is defined in terms of emotional range, with humor, guilt, anger, love, resentment, and other complex emotions and psychological states presented as unavailable to Data. His human and alien friends also find these emotions difficult to explain or describe. Feeling thus emerges as a natural, innate, or embodied aspect of being—an aspect that resists adequate description and cannot be learned or imitated.

In other texts, such as *Alien* (Ridley Scott, 1979) and the *Alien* franchise in general, android characters present different problems precisely because of their closeness to the human form. They may live and work near humans but follow orders and directives from corporations or computer programs that endanger human life or consider humans as obstacles to corporate goals. Despite their proximity to humans, androids in these stories do not share human goals, acting instead like the proverbial "wolf in sheep's clothing": The very fact of the android's ability to partly pass for human leads to this paranoid scenario, as the android's ill-fitting human form becomes a stand-in for its dubious aims and renders it inauthentic. If the reigning vocabulary for robots revolves around emptiness, being empty of feeling and flesh, the basic android modality revolves around paranoia, with androids being just passable and versatile enough to endanger human values.

Although the representation of computers as characters in such fictions is not standardized, they are also frequently structured by their distinct kind of embodiment or their lack of a body. Especially in the 1970s and 1980s, a computer's lack of embodied specificity and its association with electronic networks tended to create even more paranoid narratives, in which a computer intelligence might control objects and people from afar, as in *Demon Seed* (Donald Cammell, 1977), or could become pervasively powerful and ever present precisely because it was able to travel through electronic networks. By not being specifically embodied and located *somewhere*, computer-based entities inspire the fear that they are instead *everywhere*. The paranoid strand of such narratives often involves questions of surveillance and the loss of privacy and frequently returns to the instabilities of disembodiment, a tendency fueled by a perennial fascination with the parameters of the Turing test, in which the task of distinguishing between human and mechanical operators is complicated by the presumed impersonality of disembodied and mediated communication. In novels such as Richard Powers's *Galatea 2.2* (1995), the lack of physicality in the mode of communication between the human operator and the artificial intelligence he trains facilitates massive processes of projection, in which language itself emerges as a medium.

Finally, the humanlike bodies of fictional cyborgs bring such figures closest to human status, but their capacity for violence, their relative indestructibility, and their resistance to pain still render them clearly nonhuman in other ways. As a theoretical concept, the Cyborg (short for "cybernetic organism") was described in 1960 by Manfred E. Clynes and Nathan S. Kline in a paper outlining the adjustments that might be made to the human body to enable astronauts and other explorers to survive in

hostile environments (Gray, 1995). In contrast to this fundamentally human-form Cyborg (a term which the authors capitalize), the cyborgs of science fiction are often depicted as superstrong, exaggeratedly physical beings "clothed" in humanlike forms but supremely resilient, focused, indestructible, and often dangerous or lethal. In films such as *The Terminator* (James Cameron, 1984), the cyborg character's ability to pass for human is a source of anxiety, while its association with machinery is allegorized in behavioral patterns such as repetition, relentlessness, and lack of emotion. Indeed, the cyborg's indifference to the emotions and pain of others registers to viewers as cruelty. By the end of the film the human form has burned away from the metal skeleton of the cyborg, returning the text to the representational parameters of robotic fictions that enact the difference between the metal presence of nonhuman entities and the fleshy vulnerability of human characters. The human form in these cases enables a range of action and emotion that includes aggression, violence, and the use of slang language, in contrast to Asimov's original robots and their superethical directives.

With more lifelike bodies come more humanlike dilemmas and ethical complexities. In the implicit opposition these narratives suggest, the intense focus on rationality that robots embody contrasts sharply with the ostensibly more human qualities of emotional and moral unpredictability. A cyborg's ability to act in emotionally unpredictable and ethically complicated ways crosses a certain implicit threshold that separates human from nonhuman action. In addition, cyborg bodies are more overtly gendered and in exaggerated ways, with male cyborgs appearing as oversized, muscular, and supermasculine and female cyborgs as sexualized and often sexually exploited by the narrative. Tracing the gender implications of these robotic bodies is very important. While robots and androids may be presented as if they were nongendered or gender-neutral, they usually have a gendered demeanor or gendered voice. And while artificial men are often not presented as sexual beings, artificial women are marked by their sexuality, either in terms of a conventional and compliant hyperfemininity, as in Lester del Rey's classic short story "Helen O'Loy" (1938) and the android wives in *The Stepford Wives* (Bryan Forbes, 1975) or, in more recent decades, in terms of a dangerous sexuality and pinup looks. The female cyborg characters of the reimagined *Battlestar Galactica* (Ron Moore and David Eick, 2004–2009), for example, are depicted as dangerous or even lethal partly because of their sex appeal and are presented as sexually active in ways we don't often find in the depiction of male cyborgs (Figure 9.7).

For robotic and artificial beings, associations between body type and narrative function thus revolve around certain selections for particular materials, linguistic patterns, or professional connections for different types of artificial persons. While each new text partly revises this tradition, there are substantial continuities in such treatments, which allow us to theorize the artificial body as a body that channels certain consistent desires or trends in contemporary popular culture. In broad historical strokes, these representational patterns can be considered as coalescing in a classic mode, roughly evolving in the period from the 1920s to the 1960s and extending to the 1980s, and a more existential, alternative, revised, self-conscious, or postmodern tradition that dominates representations of fictional nonhumans in science fiction literature after the 1960s, especially in the work of Philip K. Dick, for example. This second style becomes a major mode for the depiction of artificial beings in science fiction cinema after the 1980s. Although the two modes interconnect in contemporary texts, theorizing them in this schema can provide a rough outline for the discursive choices that inform the design of new artificial bodies. Precisely because body difference and visual representation function so centrally in the classic tradition, texts that eliminate embodied differentiators open different questions. The existential strand of texts reverses the certainties of the classic paradigm by destabilizing structures of discernment.

Texts that return to the blurry existential terrain popularized by *Blade Runner* (Ridley Scott, 1982), for example, recalibrate the tendency of depictions of artificial people to enable intuitive distinctions between human and nonhuman. The lingering relevance of *Blade Runner* indeed pivots on its treatment of conflicting desires: On the one hand, the text presents the imperative to find and exterminate the Replicants, whose presence on Earth destabilizes the social order. The need to distinguish between real people and Replicants thus becomes urgent and has high stakes, since it makes the difference between living and dying for those identified as Replicants. On the other hand, however, the text removes all simple or intuitive differentiators that would allow viewers to safely allocate the human. Depicted as being virtually indistinguishable from regular people, the Replicants also possess complex memories

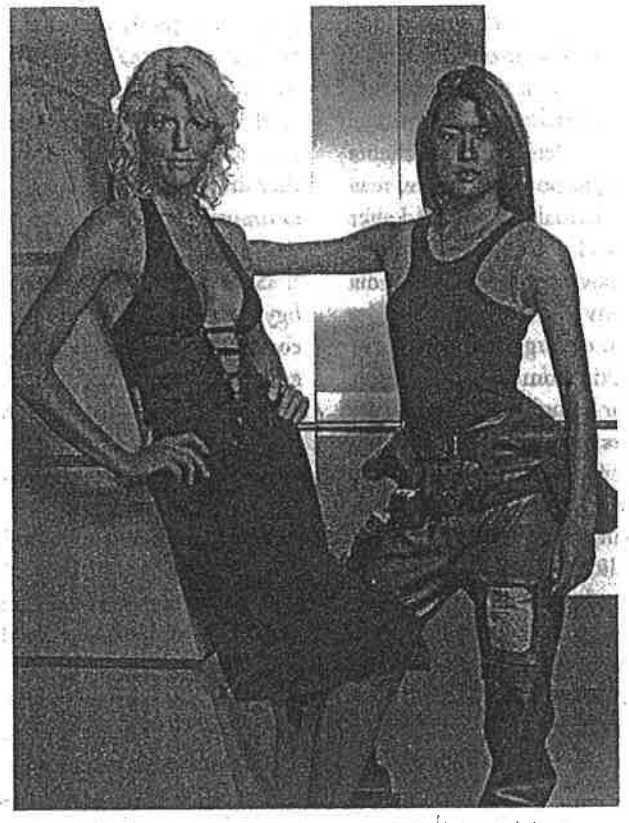

Fig. 9.7 Publicity image of two of the humanoid Cylon women of *Battlestar Galactica* (Sci Fi Season 2, Fall 2005). Number 6 (Tricia Helfer) embodies the fantasy of the sexy artificial woman, while in her numerous incarnations Number 8 (Grace Park) has played the role of a fighter, a saboteur, a human defender, and a mother figure in the show.

Credit: Sci Fi Channel/Photofest © Sci Fi Photographer: Justic Stevens.

and desires and experience sexual and emotional ties that cannot be discarded as mere imitations (Neale, 1989). By the end of the story, instead of producing a sense of order, the film further destabilizes the human, especially in the "Director's Cut" version that implies that Deckard (Harrison Ford), the policeman who has been charged with making these life-and-death decisions, may also be a Replicant (Brooker, 2006; Bukatman, 2012).

While the classic science fictional paradigm of the artificial human safeguards some vestiges of the human through implicit textual strategies, the existential strand exemplified in *Blade Runner* undermines the possibility of locating the differences between human and nonhuman. It is no coincidence, of course, that this existential strand deploys artificial people who are thoroughly human-looking and human-acting: Their bodies are clearly marked in terms of gender, race, ethnicity, and age, and they display expert use of human language and a coherent understanding of cultural institutions. Their ability to fully pass for human plays a major role in their existential potential. Films such as *Ghost in the Shell* (Mamoru Oshii, 1995), *A.I. Artificial Intelligence* (Steven Spielberg, 2001), and television series such as the reimagined *Battlestar Galactica* similarly get much of their emotional power from the fact that they present us with artificial characters that are in many respects equivalent to the real humans of their respective worlds. They also depict the artificial person in urgent and far-reaching identity quests, in which attaining human status is no longer a matter of logic, calculation, or behavior but of emotion and embodied experience. The power of such texts lies precisely in their deployment and understanding of humanity not as a state but as a becoming: While ambiguous and perhaps confusing, the existential terrain that opens up when a text does not safely distinguish between the human and the nonhuman allows us to experience the human as a negotiation rather than as a state of being.

Interface Fantasies

Even this short typology of artificial people and intelligent machines in fiction, film, science fiction,

and popular culture reveals the ways in which the body type and physical design of an artificial being, a robot, android, computer, or cyborg structures both its narrative potential and its emotional predisposition. This is not a deterministic schema because, as with everything in popular culture, new texts and films have the potential to revise and alter established paradigms. And while the examples offered here are mostly drawn from western media and literary traditions, many of the basic tendencies of the depiction of robots, cyborgs, and intelligent machines are found in texts from other traditions as well, often translated or transformed as they are adapted for use in different cultural contexts. In Japanese popular culture, for example, the robotic body has become a prime expressive locus for work in literature, cinema, manga, comics, anime, and art. Cultural differences, literary heritage, and historical context transform the tenets of the basic discursive paradigms into forms more aligned with these new contexts (Lunning, 2008).

The longevity of certain tendencies and stereotypes (robots as unemotional, cyborgs as dangerous) also offers important insights about the cultural expectations and fantasies associated with these fictional characters—expectations that may exert a latent influence on cultural assumptions about technologies and mechanisms. The relationship between fiction and reality is again paradoxical even for entities such as computers, which do exist in some form in contemporary contexts. For example, advanced computer systems in fiction and film usually do not exhibit the strict adherence to well-formed commands required in actual programming. Instead, they have often been depicted as able to interpret fuzzy commands or infer implied meanings, and this long before real-language flexibility or intuitive interfaces were technologically possible. In fiction, the computer seems to have absolute versatility and absolute access. Fictional depictions of present and future technology often presume that all aspects of life have been translated into packets of information, into data, and these data have already been digitized, codified, and rendered searchable without the expenditure of human labor for this process, without delay, and without gaps in coverage. Films such as *Minority Report* (Steven Spielberg, 2002) wow us with stunning depictions of interface design, presenting visions of an interface that is absolutely responsive and intuitive, that never resists the formulation or range of a command, never requires clarification, and never fails. In such depictions of future technology, the interface is partly dematerialized, transparent, present as spectacle, but never present as boundary, threshold, or challenge. It both is and is not there. And if the interface is experienced as being there, as a *something* and not just as a facilitating *nothing*, then it is depicted as either superbly subservient or as ominous and dangerous, as another entity or will within the system.

Similarly, depictions of a particular technology in fiction and film tend to ignore the material conditions required for its operation. It is as if a computer could access all information without any restrictions, without any interference that might arise from its design, power demands, or the state of local and global networks and infrastructure. In the disaster film *2012* (Roland Emmerich, 2009), for example, cell phones still work even while the surface of the world is melting into lava and massive earthquakes and tsunamis destroy Earth's land masses. We value and advertise technologies for the mobility they give our lives, but in the process we might forget that the technological objects themselves are bound by their design capabilities and operational needs. The scale of these needs is now so expansive as to be almost unfathomable, extending to the state of power sources, cables, servers, and routers in faraway places, the range of communication satellites floating in space, the actions of governmental structures and regulatory agencies, and the effects of political conditions around the world. In fact, the more dispersed that our networks of interrelated technologies become, the less cognizant we are of their practical limits and material requirements in our daily lives. The human labor required to ensure their operation is especially overlooked, in an implicit extension of the tendency toward dematerialization: Because advanced machines promise and often deliver access from everywhere, we forget that their operations depend on entities that are in fact somewhere and are invented, operated, and maintained by someone. People often describe advanced technology in terms of magic, but the technological dream is in fact partly a dream of dematerialization, in which both the technological object and the laborer disappear. Fictions of robotic and automated worlds feed the desire for action without labor even as they then allegorize and personalize the laborer in the body of the robot or android.

We must understand this affective tendency in the popular imaginary because it can explain why actual technologies are so fundamentally frustrating. If the fantasy of the ideal technology tends toward

dematerialization, the ideal technological event would combine desire and action seamlessly, as if action could result from mere thinking, mere wishing. In this schema, *any* expenditure of energy to program or operate a machine may be felt or imagined as being too much, especially compared with the infinite abilities and nonexistent requirements of machines in fiction. The sense of frustration with technology and the dream of dematerialization it implies are familiar in everyday life, an emotional rubric that structures people's responses to mechanical operation and human-machine interactions. Put in a simplified and schematic way, in addition to its other goals, research in affective computing aims to redirect the expenditure of labor by imagining solutions that allow the machine to absorb more or different aspects of the labor involved in interacting with it. The promise of affective computing is that users will have to do less to ensure fluid and satisfying interactions with a technology because—by adapting its operations to match the dynamic pace of the human world and the ever-changing reactions of human users—the technology has the ability to meet them more than halfway.

Emotional Patterns

Given the fact that technological fantasies traffic in the promise of the absolute absence of labor, would we want our machines to have more presence, more personality? This question fuels the sarcastic representation of technology in Douglas Adams's *The Hitchhiker's Guide to the Galaxy*, where everyday machines are designed with "Genuine People Personalities" in the form of perennially and annoyingly cheerful automatic doors as well as Marvin the Paranoid Android, not so much paranoid as severely depressed. What we need to recognize here is the distinction between responsiveness, which might be desirable in a machine because it might enhance its interactions with a human user, and characterization, which is what we respond to with fictional robots but would probably find problematic in a machine we intend to use. Although Marvin is a spoof on the science fictional tradition for robots and androids, intelligent machines are never merely responsive or impersonal in fiction and film and are usually highly individualized. They are characters, memorable because of their personalities rather than their mechanical functions.

Consider, for example, the emotional responsiveness and range of the main *Star Wars* robots R2-D2 and C-3PO. Given the emotional patterns of the classic tradition, which tends to present robots as unemotional, these are highly unusual robots and quite individual. While in the company of human characters, C-3PO seems more stilted and command-driven than when he is with other robots, although his insistence on explanations occasionally makes him annoying to humans, aliens, and robots alike. He is articulate, almost verbose, but also nerdy, slightly neurotic in his insistence on detail, whiny and chatty during hard times, and especially talkative when he is stressed and fearful, which happens often, as dangerous situations render him almost hysterical. Despite this versatility, he often seems unable to understand the human characters' motives, and this serves as a narrative device, as his bewilderment allows people and robots to explain things to him and thus to the viewers. In contrast and despite the presumably utilitarian simplicity of his design, R2-D2 is emotionally perceptive and adept at figuring out what is going on at any given point in the story. Indeed, R2-D2 can register, interpret, and anticipate the emotional needs of the human characters. The little robot's many clicking, whirring, and beeping noises are so perfectly suited to the context that they become their own language, and the robot's ability to understand and react is sometimes more direct and effective than what we see as the emotional range of the human characters. Taken together, the two robots play a central role in the narrative: They often express the emotional content of a situation that the human characters are unable or unwilling to articulate; they explain or externalize aspects of the story that may be confusing for viewers; and they express the sense of danger or fear at a particular moment that the characters disavow or that the action-driven narrative bypasses. In fact, despite their physical depiction as robots, they act out exactly the kinds of questions that a child or young viewer would ask in order to grasp the flow of the story. In addition to being the sidekicks of the main human characters, they anticipate the viewer's emotions and questions.

The humor or poignancy of these depictions of robotic characters stems from the way in which they identify just how limited and specific the emotions one expects from a mechanical entity are, how funny it is to hear C3PO whine about the rough terrain, or how unexpected it is to hear Marvin, designed as a classic android servant, complain about the menial tasks he is asked to perform. These dense characterizations break with the overall tendency to depict intelligent machines as obedient, reliable, and predictable. Some of the other common emotional stereotypes we find in fictional

depictions of simpler machines include cheerfulness or mindlessness, relentlessness, the inability to stop or change course, repetitiveness, and lack of contact or connection with the environment. The distinction between action (which can be preprogrammed) and intention (which implies will or choice) is often manipulated in fictional media to create gothic effects, as in the depiction of the dangerous androids of *Westworld* (Michael Crichton, 1973), in which a gunslinger robot pursues and kills people in the high-tech adventure park. The killing spree may just be the result of a malfunction, but the emotional effect follows the classic "robot running amok" theme, which in science fiction literature and film is also related to the fear of racial uprising or class warfare.

Popular media may use the figure of the robot as a stereotype of automation, efficiency, mindlessness, and automatism. This in a way enables a definition of the human as impulsive, poetic, creative, and messy. In fiction, science fiction, and cinema, these fantasies are projective and dynamic, as any figuration of the robot also creates a figuration of what the human would be. Robots, androids, cyborgs, and other fictional intelligent machines open a narrative space for projection and are rather dynamic as characters despite their often stilted body language and limited emotional range. Even figures that are designed not to experience or express emotion can be read in emotional ways, and such characters often inspire rather deep feelings—of fascination, recognition, pity, identification, compassion, or understanding in their audiences. For example, when a character such as Commander Data receives what humans might consider an insult and replies blithely "I am unable to feel that emotion," his emotional immunity inspires both his colleagues and the viewers of the show to feel the insult for him. At that moment we may, as viewers, feel sorry for this character, as he cannot experience an emotion we associate with complex humanity. But on the other hand, perhaps we create these kinds of characters because sometimes we crave emotional immunity and wish that we did not feel that emotion either. Wouldn't it be great if bullying, intimidation, discrimination, and other forms of emotional violence in our everyday lives could be brushed aside with "I am unable to feel that emotion"?

When machines display overt emotion in fiction and film, the effect can be destabilizing for the story and for readers or viewers. In *2001: A Space Odyssey* (Stanley Kubrick, 1968), for example, as the main computer system HAL malfunctions, it begins singing an old-fashioned love song ("Daisy Bell" written in 1892). This entity is responsible for the death of the crew of the spaceship and has been not just indifferent but criminally aggressive toward the human astronauts. And yet the resonance of the song in the empty spaceship and its association with the computer's last minutes of function give this moment human poignancy, especially since much of the rest of the film refrains from romantic, emotional, or sentimental registers. While HAL is a prime example of the worry that depending too much on technology may have unforeseen or deadly effects, the film treats the computer's disassembly as if it were a death, as the song presents a nostalgic or childlike perspective for an entity that never had a childhood. We do not know HAL's motivations or reasons—if there are any—but at this point it is hard to assign to his actions the simple label of "malfunction." In these last moments HAL acquires a kind of emotional humanity, albeit a confusing, murderous, or manipulative one, just through the song. And of course the song is saturated with emotion partly because it is presented through the use of a human voice for HAL, a breathy whisper, instead of a mechanical or computerized voice. We associate voice with emotion, voices are gendered and inflected, and singing is an emotional act.

Fictional media thus treat the representation of machines and emotion on two separate axes: The emotion that is represented as being felt by the machine itself is completely independent and may contrast sharply with the emotion that the representation produces in the audience. A very unemotional entity, an inanimate object, an unfeeling robot, an impersonal voice can become the vehicle for massive modes of emotional projection and trigger intense reactions in a human audience. We supply the emotion, we interpret the inanimate, the inarticulate, the unemotional as figures of pathos, we project ourselves into the emotional void or the silence of a mechanical or artificial entity. In addition to engaging with a fundamental lyrical or poetic premise that art, poetry, or language animate the inanimate, the desire to give voice to the silenced, or to read silence as oppression refers to historical precedents for negotiating important questions of human suffering and injustice, evoking the sentimental traditions and historical contexts of the eighteenth and nineteenth centuries and the legal and political struggles of that era for political representation, enfranchisement, justice, and the abolition of slavery. This tradition has paradoxical effects for the design of affective computing

solutions, because such solutions often prioritize responsiveness and relatedness. Yet in fiction, the more inanimate, simple, and static an entity is, the more it can function as a figure of pathos. An independently responsive or active figure will receive a different treatment because it provides less room for the projective processes that work implicitly in these stories. We are more direct and perhaps even more confrontational with something that can talk back, whereas we may be emotionally or even unconsciously invested in silence and inaction because these qualities allow for narcissistic projection into the object.

Indeed, the personalities and emotions commonly associated with intelligent machines in fiction and film would be unnerving in real life because so many of the representations of such figures revolve around a depiction of pathos. They may not be as overtly depressed as Marvin the Paranoid Android, but artificial people such as the Replicants of *Blade Runner* or the cyborgs of *Ghost in the Shell* display a depressive tendency. They appear distant, melancholy, or disaffected and have a noir-ish or countercultural demeanor just by virtue of their complex characterization. Especially after the 1950s and 1960s, science fiction literature and film focus on the existential implications of ontological insecurity. Both paranoia and depression emerge as important emotional registers for human-looking artificial people as the characters experience the problem of knowing or not knowing what one is or whether one is surrounded by people or robots. In giving the artificial person a depressive and wistful affect, many contemporary texts counter the campiness of earlier cheerful robots but also enhance the impression of depth for these characters and add layers of psychological motivation or characterization.

Recognizing the effects of silence, voice, responsiveness, and projection is especially important for designers of affective computing and robotics applications. Designing a mechanical entity with anthropomorphic features and with a voice or with patterns of responsiveness may at first appear as a guarantee for imparting friendliness or openness. But human users are quite complex in their reactions to objects and to machines, and while a responsive design may inspire a sense of play or experimentation, the same design may become cumbersome or annoying when the focus of the user is more specifically utilitarian or when the task is complex. In an affective computing application, a tone that might appear friendly at first may not be trusted to guide or give instructions, or it may be experienced as slow or falsely cheerful as the user becomes more competent in navigating the interface. In human interactions, emotion is reciprocal and reacting to emotion is immediate and intuitive. A human helper can tell that you are in a hurry and may give instructions faster or decide to dispense with parts of the process. A person can tell that a word or term was not understood and may switch the style or tone of directions midsentence without making you feel ignorant. A person lives in the same real-world context as the user and might also feel the emotional weight or emotional content of a particular day or a particular part of the year. The subtlety and variety of human reactions is nothing short of overwhelming when seen in context, and all this is complicated further by cultural and historical factors and by the wide range of human differences and modes of demeanor or performance. Indeed, one important consideration for any affective computing project is that it may not be necessary or even desirable to try to replicate such versatility in machines. On an especially difficult or hurried day, the impersonality of a mechanical system may be reassuring. What may appear as impersonal or cold in one schema may be experienced as efficient or professional in another. And we should not forget that human cultures have a variety of patterns for understated emotion, scripted interaction, respectful distance, and established patterns of formality and social decorum. Such emotive tendencies may be more appropriate for use in the design of affective systems than the fully emotional behaviors we sometimes see robots display in fiction and film.

In addition, as the fictional and cinematic tradition implies, it may not be necessary to implement humanlike capacities for affective systems because capacities that are *not* humanlike can be both eloquent and efficacious: Human users can establish and sustain a wide range of relationships with machines and inanimate objects. Recent texts are more self-conscious about the nexus of projection, narcissism, and interrelatedness that informs our relationship to machines; this is partly because they take into consideration recent developments in robotics research. The short narratives of *Robot Stories* (Greg Pak, 2003), for example, offer thoughtful perspectives about what living with intelligent and emotionally responsive machines might entail, not because of what the machines will do but because of what humans might do. In one story a young couple requests permission to adopt a human child, but they must first learn to care for a robotic "baby" assigned to them by a government

agency. Through the process of caring for the robot baby, they realize just how projection and selfishness become involved in the act of caring and are soon shocked to discover that they have subjected the robot to forms of emotional abuse they remember from their own childhoods. Similarly, the human fighter of *Real Steel* (Shawn Levy, 2011) creates a narcissistic bond with the boxing robot that has been repaired and retrained by his son. The human-robot interaction here is truly a form of mirroring, in which the robot is programmed and partly trained to replicate the exact motions of the human boxer. Instead of depicting the robot as a separate entity, an entity whose difference from the human might entail a kind of adaptation or confrontation with otherness, the robot is easily folded into the human boxer's ego, his love of boxing, his skill and craft. This robot functions as an extension of human ego in much the same way as the supersuits of *Iron Man* (Jon Favreau, 2008) facilitate Tony Stark's desires without ever becoming a boundary. These tales identify implicitly just how narcissistic our relationships with tools and machines might be, as they showcase how the human user's desire powers both human and robot.

The idea that human users project their desires onto robots also informs the story of *Robot and Frank* (Jake Schreier, 2012), in which Frank, a retired jewelry thief who is in the early stages of dementia or Alzheimer's disease, becomes friends with the robot that takes care of him (Figure 9.8. Frank teaches the robot to pick locks, and they go out on jewel heists together. This robot is designed according to contemporary projections about medical or household robots that would aid aging or ailing humans in the future, and its stylization, body design, and functionality follow more or less realistic parameters. And since the robot as a character is portrayed in a more realistic way, the story also affirms how central the human user's desires are for the interaction between human and robot. By the end of the story, the robot suggests that its memory would have to be erased so that the police cannot prove the crimes of the two conspirators. The film creates poignant contrasts between Frank's failing memory and the robot's perfect memory; and between the robot's utilitarian suggestion about erasing the past and Frank's desire to hold on to all the actions and events that transform this robot into an individual, his friend. A fragile reciprocity emerges, as the robot possesses their shared memories in a way that Frank no longer can. As Frank's memories fade, the robot would be in the position of projecting this remembered shared identity back onto Frank.

As robotics applications become more familiar to the general public, the representation of robots and other intelligent machines in fiction and film changes. In some texts, the depiction of robots may tend toward realism, as fictional robots are designed to resemble or approximate what we now know to be possible (Gates, 2007; Goldberg, 2000; Goldberg and Siegwart 2002). Other texts remain free from such requirements and continue to engage and revise the literary and cinematic tradition for the behavior and characterization of robots. For researchers in affective computing and robotics, this evolving cultural archive and its complex depictions and interpretations of human-machine interaction can provide valuable information about the responses and expectations of the scientists designing such applications as well as their users.

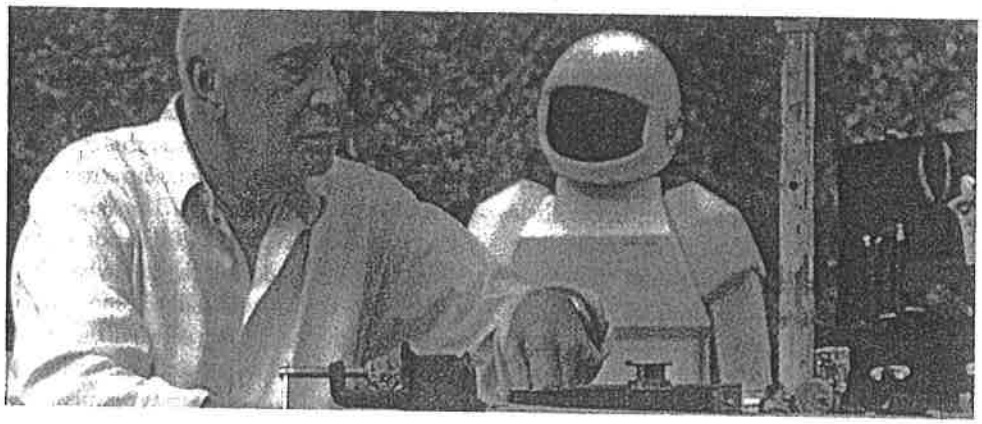

Fig. 9.8 The domestic robot and the former jewel thief (Frank Langella) come to an understanding in *Robot and Frank* (Jake Schreier, 2012). © Sony Pictures.

Notes

1. Brooks and his research are featured in the documentary *Fast, Cheap & Out of Control* (Errol Morris, 1997).
2. For general information and market data and trends in the use of industrial robotics, see the Robotics Industries Association, available at: http://www.robotics.org/index.cfm.
3. For example, robots manufactured by the KUKA Robotics Corporation have a wide range of uses, from automotive to materials handling to entertainment. Despite their efficiency and versatility, these robots are often not recognizable by the general public as being at the cutting edge of robotics research.
4. Contemporary editions of the novel, like those by Marilyn Butler (1998) and J. Paul Hunter (2012), for example, mark the differences between the two editions. See also Butler (1993) for a discussion of the scientific context that might have affected Shelley's changes.
5. The first instance of the word *robotics* is in Isaac Asimov's "Liar" (*Astounding Science Fiction*, May 1941). Isaac Asimov, "Runaround" (*Astounding Science Fiction*, March 1942). See Gunn, 1996, 41–65.

References

Adams, D. (1997). *The hitchhiker's guide to the galaxy*. New York: Del Rey.

Asimov, I. (1976). The bicentennial man and other stories. New York: Doubleday.

Asimov, I. (2004). *I, robot*. New York: Bantam Spectra. (Originally published 1950.)

Baer, E. (2012). *The golem redux: From Prague to post-Holocaust fiction*. Detroit: Wayne State University.

Baum, L. F. (2006). The wonderful wizard of Oz. New York: Signet. (Originally published 1900.)

Brooker, W. (2006). *The blade runner experience: The legacy of a science fiction classic*. London: Wallflower Press.

Brooks, R. (2003). *Flesh and machines: How robots will change us*. New York: Vintage.

Bukatman, S. (2012). *Blade runner*. London: British Film Institute.

Butler, M. (1993, April 4). Frankenstein and radical science. *Times Literary Supplement*. Rpt. in J. P. Hunter (Ed.), *Frankenstein: A Norton Critical Edition*. New York: Norton.

Čapek, K. (2004). *R.U.R. (Rossum's universal Robots)*. Claudia Novack, Trans. New York: Penguin.

del Rey, L. (1970). Helen O'Loy. In RobertSilverberg (Ed.), *The science fiction hall of fame* (Vol. 1). New York: Doubleday. (Originally published 1938.)

Elsaesser, T. (2008). *Metropolis*. London: British Film Institute.

Gates, B. (2007, January). Dawn of the age of robots: A robot in every home. *Scientific American, 296*(1), 58–63.

Goldberg, K. (Ed.). (2000). *The robot in the garden: Telerobotics and telepistemology in the age of the Internet*. Cambridge, MA: MIT Press.

Goldberg, K., and Siegwart, R. (Eds.). (2002). *Beyond webcams: An introduction to online robots*. Cambridge, MA: MIT Press.

Gray, C. H. (1995). An interview with Manfred Clynes. In C. H. Gray (Ed.), *The cyborg handbook* (pp. 43–53). New York: Routledge.

Gray, C. H., Figueroa-Sarriera, H., and Mentor, S. (Eds.). (1995). *The cyborg handbook*. New York: Routledge.

Gunn, J. (1996). *Isaac Asimov: The foundations of science fiction*. London: Scarecrow Press.

Haraway, D. (1991). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Simians, cyborgs and women: The reinvention of nature* (pp. 149–181). New York: Routledge. (Reprinted from *Socialist Review*, 80 [1985], pp. 65–108.)

Hayles, N. K. (1999). *How we became posthuman: Virtual bodies in cybernetics, literature, and informatics*. Chicago: University of Chicago Press.

Hunter, P. J. (Ed.). (1995). *Frankenstein: A Norton critical edition*. New York: Norton.

Huyssen, A. (1982). The vamp and the machine: Technology and sexuality in Fritz Lang's *Metropolis*. *New German Critique24/25*, 221–237.

Idel, M. (1990). *Golem: Jewish magical and mystical traditions on the artificial anthropoid*. Albany: State University of New York Press.

Kang, M. (2010). *Sublime dreams of living machines: The automaton in the European imagination*. Cambridge, MA: Harvard University Press.

Kurzweil, R. (2000). *The age of spiritual machines: When computers exceed human intelligence*. New York: Penguin.

Lunning, F. (Ed.). (2008). *Mechademia 3: Limits of the human*. Minneapolis: University of Minnesota Press.

McCaffery, L. (Ed.). (1991). *Storming the reality studio: A casebook of cyberpunk & postmodern science fiction*. Durham, NC: Duke University Press.

Menzel P., and D'Alusio, F. (2001). *Robo sapiens: Evolution of a new species*. Cambridge, MA: MIT Press.

Milburn, C. (2008). *Nanovision: Engineering the future*. Durham, NC: Duke University Press.

Moravec, H. (2000). *Robot: Mere machine to transcendent mind*. New York: Oxford University Press.

Neale, S. (1989). Issues of difference: *Alien* and *Blade Runner*. In J. Donald (Ed.), *Fantasy and the cinema*. London: British Film Institute.

Riskin, J. (Ed.). (2007). *Genesis redux: Essays in the history and philosophy of artificial life*. Chicago: University of Chicago Press.

Scholem, G. (1996). *On the Kabbalah and its symbolism*. R. Manheim, Trans. New York: Schocken Books.

Shelley, M. Wollstonecraft. (1998). *Frankenstein or the modern Prometheus. The 1818 Text*. Ed. MarilynButler. New York: Oxford University Press.

Shelley, M. Wollstonecraft. (2012). *Frankenstein or the modern Prometheus*. Ed. J. Paul Hunter. New York: Norton.

Telotte, J. P. (1995). *Replications: A robotic history of the science fiction film*. Chicago: University of Illinois Press.

Suggested Fiction

Adams, D. (1997). *The hitchhiker's guide to the galaxy*. New York: Del Rey. (Originally aired 1978, BBC Radio 4.)

Asimov, I. (2004). *I, robot*. New York: Bantam Spectra. (Originally published 1950.)

Bacigalupi, P. (2010). *The windup girl*. San Francisco: Nightshade Books.

Cadigan, P. (1987). *Mindplayers*. New York: Bantam Spectra.

Cadigan, P. (1991). *Synners*. New York: Bantam Spectra.

Čapek, K. (2004). *R.U.R. (Rossum's universal Robots)*. Trans. ClaudiaNovack. New York: Penguin.

del Rey, L. (1970). Helen O'Loy. In R. Silverberg (Ed.), *The science fiction hall of fame* (Vol. 1). New York: Doubleday. (Originally published 1938.)

Dick, P. K. (1996). *Do androids dream of electric sheep?* New York: Del Rey. (Originally published 1968.)

Gibson, W. (1997). *Mona Lisa overdrive*. Spectra. (Originally published 1988.)

Gibson, W. (2000). *Neuromancer*. New York: Ace. (Originally published 1984.)
Gibson, W. (2006). *Count zero*. New York: Ace. (Originally published 1986.)
McCaffery, L. (Ed.). (1991). *Storming the reality studio: A casebook of cyberpunk & postmodern science fiction*. Durham, NC: Duke University Press.
Pohl, F. (2011). *Man plus*. New York: Orb Books. (Originally published 1976.)
Powers R. (1995). *Galatea 2.2*. New York: Farrar Straus & Giroux.
Scott, M. (2011). *Trouble and her friends*. New York: Orb Books. (Originally published 1994.)
Shelley, M. Wollstonecraft. (1998). *Frankenstein or the modern Prometheus. The 1818 text*. M. Butler, Ed. New York: Oxford University Press.
Shelley, M. Wollstonecraft. (2012). *Frankenstein or the modern Prometheus*. J. P. Hunter, Ed. New York: Norton.
Stephenson, N. (2000). *Snow crash*. New York: Bantam Spectra. (Originally published 1992.)
Stephenson, N. (2000). *The diamond age: Or, a young lady's illustrated primer*. New York: Bantam Spectra. (Originally published 1996.)
Sterling, B. (Ed.). (1988). *Mirrorshades: The cyberpunk anthology*. New York: Ace. (Originally published 1986.)
Sterling, B. (1989). *Islands in the net*. New York: Ace. (Originally published 1988.)
Sterling, B. (1996). *Schismatrix plus*. New York: Ace.

Suggested Film and Television

The golem (Eg Paul Wegener, 1920)
Metropolis (Fritz Lang, 1927)
Frankenstein (James Whale, 1931)
The day the earth stood still (Robert Wise, 1951)
Forbidden planet (Fred M. Wilcox 1956)
2001: A space odyssey (Stanley Kubrick, 1968)
Westworld (Michael Crichton, 1973)
The Stepford wives (Bryan Forbes, 1975)
Demon seed (Donald Cammell, 1977)
Star Wars (George Lucas, 1977)
Alien (Ridley Scott, 1979)
Blade runner (Ridley Scott, 1982)
The terminator (James Cameron, 1984)
Star trek: The next generation (Gene Roddenberry, 1987–1994)
Ghost in the shell (Mamoru Oshii, 1995)
Fast, cheap & out of control (Errol Morris, 1997)
The bicentennial man (Chris Columbus, 1999)
A. I. artificial intelligence (Steven Spielberg, 2001)
Minority report (Steven Spielberg, 2002)
Robot stories (Greg Pak, 2003)
I, robot (Alex Proyas, 2004)
Battlestar Galactica (Ron Moore and David Eick, 2004–2009)
WALL-E (Andrew Stanton, 2008)
Iron man (Jon Favreau, 2008)
2012 (Roland Emmerich, 2009)
Real steel (Shawn Levy, 2011)
Robot and Frank (Jake Schreier, 2012)