Sentimental Machines

—"GOOD MORNING, SIRI."
— "HI, DANIELA. IT'S 13:46, BY THE WAY."

HEY, I'M AIDO, I'M FRIENDLY TOO

HEY, I'M JIBO, I'M FRIENDLY

When we tell Siri "I love you", Siri answers back: "All you need is love. And your iPad". Weirdness and commercialism aside, Daniela and Christian uncover an emerging emotional relationship between people and our machines.

Written by DANIELA SILVESTRIN & CHRISTIAN RAUCH

Have you ever tried to have a chat with an Artificial Intelligence? Siri, Apple's iOS program working as an "intelligent personal assistant" and "knowledge navigator" probably comes closest to what we currently can experience on a personal level. According to Ray Kurzweil, it is only a matter of a few years until artificial intelligence will reach the level of the technological singularity, meaning it will be able to exponentially improve and reprogram itself, thus ultimately be independent of human support, care and interference. In this vision, machines and software will become independently acting entities, dramatically surpassing humans in intelligence, and evolve into a new kind or form of "life". Meanwhile, intelligent machines are on the verge of becoming our new companions, supposed to help, assist, entertain and accompany us—in short, to make our lives easier and happier. Some more humanoid than others, more and more companion robots are hitting the market, ready to fill gaps and take over positions once occupied by family, friends, or other humans. Starting from still rather simple versions with reduced mobility and person-like features, EMYS™, AIDO or JIBO are friendly little robots that assist you with housekeeping and organizing your daily tasks, communication and appointments.

"You are boring, Siri." — "I'm juggling flaming swords right now. You just can't see it."

While these robots are still clearly machines imitating life and are closer to our computers, smartphones and other connected devices that offer speedy connectivity, what really comes as a novelty are robots that—in addition to being such assistants—are designed to be new social companions. The humanoid robot Pepper, for example, has been developed to be "a genuine day-to-day companion, whose number one quality is his ability to perceive emotions". Pepper can recognize principle human emotions through interpreting the interlocutor's voice, facial expression, verbal and non-verbal communication, and adapt his behavior to the person's mood. Not only can Pepper do this through reacting directly by adapting his expressions through the color of his eyes and tone of voice; he also learns and evolves through the experiences made with a person, reacting in a more adapted way to each person every time: "Pepper gradually memorizes your personality traits, your preferences, and adapts himself to your tastes and habits". Pepper is a full size robot, creating a fully-"grown" counterpart to a human; his little brother, Kirobo Mini (announced by Toyota just recently), is by contrast only 10 centimeters tall and was created to be a personal communication companion with the task of "helping driving become a physically and emotionally transformative experience". Like Pepper, Kirobo Mini can engage in conversation and small talk with his counterpart while reacting to that person's emotional state through reading and memorizing his or her facial expressions, tone of voice and movements, as well as likes and dislikes.

It is still a rather alien idea to have a real conversation with an intelligent machine or program, let alone the idea of talking with them about something as intrinsically human and personal as emotions. How could an artificial intelligence ever understand what it means to have a broken heart because of unrequited love? Or actually how it feels to be *in* love?

"Siri, I am in love with you." — "Oh, stop." "Do you love me, Siri?" — "I respect you."

While Siri has a series of glib or even cheeky answers in store, an exchange with Siri is still far from what anyone would consider a serious conversation, like it is with Samantha in Spike Jonze's movie "Her". To really fall in love with Siri seems like a ridiculous idea, but we can already empathize with Theodore falling in love with Samantha in the movie. To love and to feel sexually attracted to machines is actually a real phenomenon, discussed under the term *mechanophilia*, and while we might laugh about reported cases of people having sex with cars and bicycles, or marrying a computer game character, or having machine fetishes, dating simulation games like *My Virtual Girlfriend* are booming in Japan and normalizing our relationships to artificial characters on an emotional level.

"Siri, do you have feelings?" — "Hmm, let me feel... nope. Nothing."

To accept them as companions on a broad level, we need robots and intelligent computer programs to not only fulfill tasks and reply to rational questions with informative facts, but also to speak to us on an emotional level, to read and react to our moods and feelings. Emotions are a fundamental source of our most personal experiences in the world. Often considered the essence of what it means to be human,

HELLO THERE, I'M PEPPER. I'LL MEMORIZE YOUR PERSONALITY TRAITS, HABITS, TASTES AND PREFERENCES AND ADAPT MYSELF TO YOU!

to be "yourself", they are a key influence that motivates action and determines interactions with others. For most of the history of science, emotions have eluded empirical study, considered to be too intangible and too subjective. But during the last couple of decades, groundbreaking discoveries and advancements in areas such as experimental psychology, affective neuroscience, artificial intelligence, molecular biology and robot ethics have created a new momentum for research and experimentation, leading to the development of technologies and applications able to measure, interpret and simulate emotions in various ways and for a wide range of purposes.

To integrate and use these technologies for the development of intelligent machines and computer programs, able to speak to us on a "human" level, is only one of several areas where these studies are being applied. The pursuit of better emotional understanding in humans has also been used in the development of commercial and other applications that measure, quantify, and track our inner and most personal states in order to target us more precisely on subconscious levels. Our faces have become transparent mirrors to our souls and thoughts, as we are not able to control facial micro-expressions when emotionally reacting to something we hear, see or feel. As new facial recognition software becomes increasingly sophisticated, artificial intelligence is able use that information in ways that humans can't. So we might well ask: What else has been embedded into our interaction and communication with others, without us being able to notice it? What all is being tracked and measured, and to what extend and what purpose for me—or against me? ▶

(Left Page) Jibo, InGen Dynamics / Aido Robot, Softbank (Right Page) Pepper Robot

CALIFORNIA DREAMING™

The annual output of scientific research is doubling every nine years, so to follow the latest developments in science and research is becoming increasingly difficult for experts and non-experts alike. More than ever, we are living in a time where science and technology have become the key influencers and driving forces for economic and social progress—and its leading us faster and faster. To ensure this will be to our benefit, we should all get involved: to create meaning, find relevance, ask questions, steer discussions, critique, detect dangers and speak out to make these discussions more inter and trans-disciplinary. Next to historians and philosophers of science, legal experts, engineers and developers, DIY tinkerers, media theorists, journalists, and political scientists, it is artists who can and do play a meaningful role in reflection and analysis about scientific innovation. Marshall McLuhan, a media theorist and philosopher once said that art acts as a kind of radar, as "an early alarm system…enabling us to discover social and psychic targets in lots of time to prepare to cope with them. This concept of the arts as prophetic, contrasts with the popular idea of them as mere self-expression….Art as a radar environment takes on the function of indispensable perceptual training rather than the role of a privileged diet for the elite." Love you, Siri, it was good talking to you, but don't we need love, our iPad—and art and science too?

Illustration — Per Törnberg

Beneath the allure of the Internet as democratic, power consolidates into fewer and fewer hands. Aaron pulls back the curtain.

Written by AARON BORNSTEIN

"Our world is different," stated John Perry Barlow in his 1996 essay, "A Declaration of the Independence of Cyberspace." He promised a world in which "all may enter without privilege or prejudice", to "express his or her beliefs…without fear of being coerced into silence or conformity", and be free of "legal concepts of property, expression, identity." The breathless manifesto was not only long on its predictions, it was also notably absent of a definition of who exactly constituted the "our" to whom this world belonged.

The missive—delivered, apparently without irony, from the annual meeting of global economic and political elites at Davos—was neither the first nor last to herald the liberatory promise of a global Internet. But Barlow was a former songwriter for the Grateful Dead with a large social network, and so provided arguably the most lyrical and certainly most widely heard argument. The ethos he articulated was what critics Richard Barbrook and Andy Cameron had a year earlier derisively termed the "Californian Ideology": the belief—held mainly by a small but influential group of rich, white males living in California—that global networks would unleash a new era of democratic potential, rendering industrial-era power relations irrelevant, like obsolete software. Barbrook and Cameron pointed out that this was already untrue: the businesses and research labs building the network depended on a massive underclass of low-wage, unprotected, largely invisible, mostly black and brown workers. They charged that the ideology's intentional disregard of "who" in favor of "what" was a critical flaw, through which the Internet would reproduce the very same world from which it was supposed to be "different."

But to take account of inequities rooted outside "the Net" was antithetical to the new constitution. In declaring that "our identities have no bodies", Barlow and his cohort staked the claim that liberation sprung naturally from anonymity. If one's ideas could be detached from one's body, the reasoning went; then the resulting world would by necessity be race-, gender-, and status-blind. After all, doesn't everyone look the same when reduced to text on a screen? (A premise at least plausible in the network's earlier days, when users were largely homogenous in these characteristics.) The cyber-revolutionaries aimed to extinguish inequality simply by obscuring it.

version of the American "wild west." He started the "Electronic Frontier Foundation" (EFF), a non-profit dedicated to resisting laws that might tame this wilderness. They believed that a decentralized network would remain, by its sheer fact of existence, immune to control by any one state. As EFF co-founder John Gilmore wrote, "the Net interprets censorship as damage, and routes around it."

What Barlow and Gilmore missed, and Barbrook and Cameron realized, was that the social fabric built over the network was itself vulnerable to consolidation, which the physical architecture had no means to prevent. Both groups turned out to be right—the Internet has become a wild west, but not the sort romanticized in Eastwood films. Instead, it more closely resembles the actual wild west, where individuals are subject to the law of 'might makes right', capital has free reign to violate and consolidate, and states act with violent impunity.

At the time these writers were dueling, the west had not yet been won. Most communication flowed via an anarchic mesh of discussion forums and chat groups, following

Groovy

The only threat the Californians could envision was government regulation, and this battle consumed all their attention. Barlow, raised on a Wyoming cattle ranch, saw the Internet as a stylized protocols that eschewed any single point of control. But within a few years, this mode of free association was supplanted by a standard amenable to mediated (and monetized) transactions: the World Wide Web. On the Web, and in particular its iteration as "Web 2.0", communications are funneled through "sites", ports of entry that quickly became consolidated under the aegises of a handful of large, profit-making corporations.

The result is that, despite any appearance of heterogeneity, the underlying network is stunningly concentrated. On any given day, one third of web users visit a site hosted by Amazon Web Services. More than 65% of searches are served, filtered, and stored by Google, whose ranking algorithm remains secret and is, according to insiders, in no small part comprised of thousands of hand-written rules. Every day, over 60 billion messages pass through Facebook, three times as many as sent via SMS. Each year more data is being pro- ▶