Hello, Robot.
Hello, Robot. Design between Human and Machine

“Hello, Robot. Design between Human and Machine” looks at how robotics is entering our everyday lives and shows the decisive role played by design. A broad range of exhibits illustrates the areas where we are already encountering robots today and where we are likely to see them in the near future: in industry, the military, in our day-to-day environments; in children’s bedrooms and old-age homes; in our bodies and in the cloud; while shopping and having sex; in computer games and, of course, in film and literature. The show examines our – often ambivalent – relationship to new technology and discusses the opportunities and challenges we face both as individuals and as a society. It raises awareness of the ethical and political questions that arise today in light of the technological advances in robotics, and confronts us with the contradictions often contained in the answers to these questions.

Design plays a central role in these complex dynamics, having always been a mediator between humans and machines as well as between different disciplines. In the discourse on robotics, design straddles seemingly insurmountable contradictions. While the debate oscillates between enthusiasm and criticism, hope and fear, utopia and dystopia, design offers concrete solutions as well as thought experiments showing that the truth often lies at both extremes at once: developments in robotics provide cause for joy and concern in equal measure. And in this context, design is about more than just appearances. “Hello, Robot” addresses the way design shapes the interactions and relations between humans and machines, but also between humans – for good and for bad. “Hello, Robot” also shows that design is indispensable if robots are to become properly integrated into our lives and not remain hidden away in washing machines, cars, and ATM machines.

The exhibition is deliberately interdisciplinary in reach. Everyday objects are presented to the visitors alongside art installations, architectural models, drawings, sketches, illustrations, posters, books, comics, photographs, films, computer games, web and interactive design. For the most part they will see robots, but not always, because “Hello, Robot” often draws on other, cutting-edge technologies to prompt a discussion about how to deal with a world of objects and an infrastructure that is becoming ever more intelligent, autonomous, and self-learning. Definitions of terms, posted on the walls in the form of a glossary, help visitors to navigate the displays, while the pictograms from a robot taxonomy with which the exhibition begins provide an overview of the multiple forms robots can take.

“Hello, Robot. Design between Human and Machine” is a co-production of the Vitra Design Museum, the MAK – Austrian Museum of Applied Arts/Contemporary Art, and the Design museum Gent. Four curators are collaborating on the concept and realisation of the exhibition, which, after its initial tour of Weil am Rhein, Vienna, and Ghent, will travel internationally. The curators were supported by an international team of advisors which included such luminaries as sci-fi author Bruce Sterling, design researcher Gesche Joost, Turin architect and head of the MIT Senseable City Lab Carlo Ratti, media art specialist Sabine Himmelsbach, and cultural and media studies scholar Paul Feigelfeld.
»Hello, Robot. Design between Human and Machine« is the story of a convergence. This convergence takes place in four stages over the course of 14 questions for the visitor. Each step narrows the gap between human and machine and broadens the definition of what constitutes a robot. Right at the outset, »Hello, Robot« lists the criteria setting robots apart from simple machines and defines the concept with the aid of a robot taxonomy. Within this basic definition, however, the term develops over the course of the exhibition, not least in order to accommodate the full spectrum of our robotic environment.

As they make their way through the exhibition, visitors are confronted with seemingly simple questions to which, on closer consideration, there are no straightforward answers. By encouraging the visitors to discuss and reflect on their own involvement with technology, the questions extend the reach of the exhibition beyond its immediate context. Irrespective of whether we are standing in front of a robot today, an automatic 1950s kitchen in a Jacques Tati film, or a far more evolved technology that our children and grandchildren will (have to) befriend in the future, the questions are always the same. »Hello, Robot« therefore remains relevant no matter how fast or relentless the pace of technological development.

To aid orientation, visitors find refined definitions and explanations of the concept of the robot on the walls, along with related buzzwords like industry 4.0, deep learning, smart cities, and singularity. These aim to sharpen the understanding of what constitutes a robot and to systematise the exhibits, which often have little to do with conventional ideas about robots.

1. Science and Fiction: »Hello, Robot« welcomes visitors with a kind of cabinet of curiosities, where they encounter robots as they would in a museum, as a foreign species that we regard with interest, but also with clichéd ideas.

2. Programmed for Work: After this initial, distanced encounter, the robot comes two steps closer – perhaps even too close for comfort – in the world of work, production, and industry. In this context, robots are often described as a threat to the human workforce. This is also how they present themselves in »Hello, Robot«, looking down in gleaming industrial light from the slightly raised position of the (stylised) assembly line.

3. Friend and Helper: With step three, humans and machines meet eye to eye. The robot is a smart assistant, a sensitive friend and an empathic helper, someone who cares for and looks after us, lives with us, someone who loves and dreams. The visitors quite literally become part of this scenario.

4. Becoming One: With step four, convergence is complete. The boundaries between human and robot dissolve when we become part of the robot (thanks to robotic architecture) and it is part of us (thanks to prosthetics, implants, and nanotechnology). The use of reflective surfaces helps to illustrate this merging process in the exhibition design.
Very few people have actually encountered a robot – at least one they would describe as such. But our ideas and expectations about robots are strongly shaped by popular culture. From a young age we learn in films, TV series, books, comics, video games, and toys what robots look like, how they communicate with us, and how they behave: they are more or less like people, but made of metal. And we all expect – more or less consciously – that one day soon we will live with robots just as we do with our friends, neighbours, and colleagues – or that we will have to defend ourselves against them before they replace us once and for all. »Hello, Robot.« confirms these ambivalent expectations – for the time being at least – welcoming visitors with a variety of friendly and hostile bipedal machines.

Our fixation with humanoid robots extends from an early fascination with automatons and into the scientific laboratories of today – although researchers really ought to know better, because in fact we are surrounded by robots and robotic systems that are capable of assuming every conceivable physical or digital form, materiality, scale, and intelligence level: from drones to check-out counters, from cranes to nanobots, and from vacuum cleaners with the intelligence of an amoeba to online chatbots that can engage in charming small talk about art. Cars and washing machines are part-robot today and, ultimately, we can define any object and system as a robot if it can take in information from its surroundings, generate outputs that manifest themselves in some physical form, and display a degree of learning capacity and autonomy in the process. Which is why, right at the start – Hello, Robot – confirms these ambivalent expectations – for the time being at least – welcoming visitors with objects that they might not have recognised as robots. Definitions and the aforementioned taxonomy are provided as aids to orientation.

The complex variety of their manifestations is matched only by the complexity and ambivalence of our relationship with robots. The question of whether we need them or even like them is not really ours to ask. They are already here, and as in the case of the smartphone, which few people considered necessary as recently as a decade ago, one day a critical mass of users of smart, autonomous objects and applications will drag even the most ardent luddites willy-nilly into the robotic age. Whether robots will then be our friends or enemies, whether we will control them or vice versa, remains to be seen. And the question whether we should trust robots is perhaps less pertinent than whether we should trust the political-economic complex of humans, organisations, and infrastructure that stands behind them.
In the world of work, production, and industry – among the general public at least – robots are strongly associated with the fear of job loss. The issue is the subject of heated debate not only in the media; designers, artists, and filmmakers too are looking at what happens when people are gradually replaced by intelligent machines in the workplace. Will our standard of living decline along with our income? Or will we finally have more time for our friends, families, and hobbies thanks to a three-day work week and an unconditional basic income? Will new professions arise, and if so, what will they be? Will we work side by side with robots who are fully networked with customers and suppliers, as Industry 4.0 promises?

The fear of losing jobs to new technologies is as old as the first industrial revolution. In those days it was looms and steam engines that rendered hundreds of thousands of jobs obsolete. Since then every technological leap has triggered the same discussions: most recently with the PC in the 1980s, the Internet in the 1990s, and now with robots. Time has shown that we have always found new areas of work even if working conditions have changed dramatically since the eighteenth century. »Hello, Robot« seeks to shed light on the current debate from different perspectives against the background of technological and social change.

In the shadow of this debate, which ultimately still presupposes traditional structures of production and labour, a completely new breed of human has evolved: the prosumer. Prosumers consume what they produce themselves. What distinguishes them from individual world reformers is that they are globally networked via the Internet and have easy access to new, digital, robotic means of production. Both factors allow prosumers to sidestep traditional markets in order to develop, produce, and distribute tailor-made, smart products. Even today digital processes such as 3D printing make it possible for individuals to produce small pieces of furniture or everyday objects at a reasonable price. To produce a bridge, a house, or a haute couture dress obviously requires a wider range of competencies, but once designs and building plans are accessible to everyone online and open workshops and Fab Labs have become as commonplace as gyms, everyone will be able to produce (almost) everything themselves.
We are already reliant on intelligent devices in our day-to-day lives. We trust our smart assistants to navigate us through foreign cities, to remind us of our anniversaries, and to provide us with information on every subject imaginable. They check our pulses and even call for help in an emergency. All these things have made our lives more comfortable and in some cases have saved them. But anyone who has had to make do without their smartphone for even one (working) day knows how dependent we are on their intelligent help, and how helpless we are when they turn out to be nowhere near as smart as promised.

Our relationships with objects and the design of these relationships have preoccupied designers for decades. Whenever consumers have the choice between a number of similar or identical products, their sensory or emotional qualities become the unique selling point. This is all the more true of intelligent objects that communicate and interact with us and give us the feeling that they can feel. Because what counts then is not their shapes or their tactile properties, but how they succeed in making us reliant upon them. If in recent times roboticists have started talking more and more about »humanised« machines, what they mean is that these machines should feel like old friends: helpful and obliging, a little overeager perhaps, but also neurotic and manipulative. And once we are caught in this mesh of relations, their loss hits us all the harder. What happens if the beloved thing is gone forever?

The robots who look after us, who nourish and care for us, who make sure we are okay, are everywhere in society. We have yet to entrust our children to robotic nannies, but there are already a host of robots designed to be playmates, teachers, and chaperones, rolled into one. The wide-scale use of robots in geriatric care is the subject of serious discussion – not only in Japan, where people have openly stood eye to eye with intelligent machines for years, but also in the West. There are good reasons for this, since even today robots are very successfully deployed in caring for and patients with dementia and Alzheimer’s disease. Younger adults don’t want or don’t have to miss out on being cared for by robots either – whether when shopping for jeans, having the groceries delivered, or taking off their new jeans for a bit of casual sex.


Kevin Greener, *Android Birthday*, video (still image), 2011

Would you live in a robot? – Do you want to become better than nature intended? – Are robots advancing evolution?

Nanobots – robots on an atomic or molecular level – may still be hypothetical, and robotic materials may still be the stuff of science fiction, but smart surfaces and moving walls that autonomously adapt to inhabitants’ needs and regulate room temperature like a skin already exist today, at least as prototypes. And the networked home, in which machines and objects communicate intelligently, is on everyone’s lips as the Internet of Things.

Deeper convergence will first take place within the «machine» in which we live. Far exceeding modernist imaginings, however, this is not limited to our houses and apartments – because robots are not limited to a single body. Any environment is a robotic system if it receives signals via sensors, processes them using artificial intelligence, and generates a physical reaction in response. In our everyday lives we encounter not only architectures of stone, glass, and concrete, but also architectures of data and communications which, to a great extent, already fulfil these criteria to a significant degree. This invisible system has become so fundamental to our daily lives and the way we live with others that no one would seriously call it into question.

The robot inside us also dissolves the human-machine divide. With the aid of modern prosthetics and implanted chips, we can achieve things that would be unheard of without artificial props – from opening locked doors with our bare hands to running world records. Questions of when humankind will merge so seamlessly with technology that we become superhuman machines, and whether or not we will be able to keep pace with society and evolution without technological upgrades, are no longer confined to science fiction magazines. In our quest for optimisation, even our own biology is not off limits. Inspired by the intelligent principles we find around us in nature, we are using robots to redesign our environment, improving on a lot of what was produced using conventional methods and even on nature’s own template. The anxiety-ridden question whether intelligent machines will one day replace all living things – ourselves included – has been around since humans began telling stories about artificial creatures. The question we must ask today is this: do humans, for the first time in history, have the technological knowledge and the tools to let science fiction become reality? There is no simple answer. Yet there can be no doubt that we are heading towards a more intelligent, more autonomous – more robotic – lifeworld than the one we know today. Design has a responsible role in creating this new lifeworld, because it is through design that we can influence how and where we encounter the smart objects and systems that surround us, how we interact with them – and they with us.
Francis Bitonti, Modular Shoes, 3D printed shoe, 2014

Universal Everything, Walking City, video (still image), 2014

Interactive Architecture Lab (UCL London), Be Earth, drawing, 2009

Asmbld Architectural Robotics, Project Dome Stations, robotic interiors, 2015

ICD/ITKE University of Stuttgart, Aggregate Pavilion, architectural element, 2015

Festo AG, BionicANTs, robotic ants, 2015

Greenpea, Noodlies, video (still image), 2014

Greenpeace, Noodlies, video (still image), 2014

Höwerler + Yoon Architecture and Squared Design Lab, Filene’s Eco-Pods, rendering, 2009

Leka SAS, Leka, robot, 2016
The Three Laws of Robotics

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 the 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 Laws.

Isaac Asimov, 1942
Institutions and Curators

**Vitra Design Museum**
The Vitra Design Museum was founded in 1989 as one of the first design museums worldwide. In June 2016, Frank Gehry’s main building was complemented by Herzog & de Meuron’s Schauderdepot, which facilitates the museum’s research and collection activities. At the heart of the Vitra Design Museum’s work is a collection that encompasses not only key pieces of design history but also various estates from noted designers.

**MAK – Austrian Museum of Applied Arts / Contemporary Art**
Founded in 1863, the MAK – Austrian Museum of Applied Arts / Contemporary Art is one of the oldest museums of its kind in the world. Located on Vienna’s Ringstrasse, it is a space of experimentation for applied arts at the interface of design, architecture, and contemporary art. In 2015 the MAK founded the Vienna Biennale for Art, Design and Architecture, in the context of which »Hello, Robot« will be shown in 2017.

**Design museum Gent**
Founded in 1903 as a collection of furniture, glass, metalwork, ceramics, and textiles samples, the museum also holds one of Belgium’s most exceptional Art Nouveau collections. The museum focuses on Belgian design in an international context and its exhibitions tackle socially relevant themes like ecology, mobility, and the public space. The museum is located in the historic centre of Ghent and is well connected with its creative and cultural ecosystem.

**Media & Interaction Design, ECAL (École d’Art de Lausanne)**
The Media & Interaction Design department at ECAL is developing a robot installation for »Hello, Robot«. Founded in Lausanne, Switzerland, ranks among Europe’s most prestigious design colleges. This interdisciplinary BA course offers students a theoretical and practical field of experimentation in cutting-edge media technology (including robotics).

**Arthur C. Clarke Center for Human Imagination**
Students of the Arthur C. Clarke Center for Human Imagination worked together with »Hello, Robot« Advisor Bruce Sterling on a project for the exhibition. The Center was founded in 2013 by the University of California, San Diego, and the renowned Arthur C. Clarke Foundation as a multidisciplinary research institute focusing on science and technology, the humanities, and art.

**Amelie Klein**
Born in 1971 in Vienna. Curator at Vitra Design Museum since August 2011, most recently for the exhibition »Making Africa – A Continent of Contemporary Design«, for which she was nominated for the 2015 ART Magazine Curator Prize. Prior to this she completed an MA in Design Criticism in New York and worked as Design and Creative Industry Editor at the Austrian daily »Die Presse«. She has published numerous articles in a range of design and architectural publications, including Axiare, Domus Online, and Metropoli.

**Thomas Geisler**
Born in 1971 in Kenzingen, Baden-Wuerttemberg. He is a curator and author on contemporary design and everyday culture. From 2010 to 2016 he worked at the MAK Vienna, where he was also Curator of the MAK Design Collection. He played a pivotal role in setting up the Victor J. Papanek Foundation at the University of Applied Arts Vienna. He is the co-initiator of Vienna Design Week and has curated exhibitions for the Vienna Biennale 2015 and the London Design Biennale 2016, among other projects. Since July 2016 he has run the Werkraum Bregenzerwald – an initiative with its own exhibition building designed by Peter Zumthor for innovative craft, design, and architecture.

**Marlies Wirth**
Born in 1980 in Neurkirchen, Lower Austria. Curator at the MAK Vienna since 2006, curating exhibitions, performances, and discursive events in the fields of art, design and architecture, including the »Hollen« retrospective (2014) and the themed group show »V47: the human condition« for the Vienna Biennale 2015. With a focus on conceptual, site-specific, research-, and time-based art and a particular interest in the cultural-anthropological contexts of artistic production, she also develops independent exhibition projects with international artists.

**Fredo De Smet**
Born in 1976 in Ghent. Curator at the Design museum Gent since 2015. Previously he worked far more than ten years as a freelance music producer, curator, consultant, and lecturer on media-culture issues in the digital age. He has founded a number of media initiatives, among them the co-creation project GenetVA in 2010, in the context of which he continues to stage events and create regular podcasts discussing the influence of technology on contemporary life. De Smet also works as an innovation consultant for the Flemish public broadcaster VRT.

**Bruce Sterling**
Born in 1954 in Brownsville, Texas. Science-fiction author, web activist, prominent design thinker, and cyberspace theorist, who played a key role in shaping the sci-fi genre of cyberpunk. Sterling has received numerous awards for his work, among them the 1997 and 1999 Hugo Award, one of the top literary prizes for science fiction. Together with his wife, Serbian author and film director Jasmina Telavanovic, Sterling lived in Serbia for several years before moving to Turin in September 2007. There, together with Telavanovic and Massimo Banzi, co-founder of the physical computing platform Arduino, he founded Casa Jasmina, an open-source platform researching and developing the Smart Home of tomorrow.

**Carlo Ratti**
Born in 1971 in Turin. After studying Architecture and Engineering in Paris, Cambridge, and Turin, Ratti became a fellow at the MIT Media Lab under Hiroshi Ishii before taking on a teaching post at Harvard and the Stelka Institute in Moscow. He founded his own architectural office in Turin in 2003 and the Senseable City Lab at MIT in Boston one year later. He is still its director today, researching the concept of the Smart City by combining new digital technologies with design and urban planning. Ratti has lectured on the Smart City all over the world and has written countless articles on the subject for design and architectural publications. He lives and works in Boston and Turin.

**Geisce Joost**
Born in 1974 in Kiel. She studied Design in Cologne, writing her dissertation on rhetoric. She was Professor for Interactive Design and Media at the Technical University, Berlin, until 2010. Joost was the founding Board Director of the German Society for Design Theory and Research. As a member of several advisory committees for the German government, she has been highly influential in shaping the concept of Industry 4.0. Since 2005 she has run the Design Research Lab at the Berlin University of the Arts. The Lab concentrates on interdisciplinary design research projects at the interface of technological innovation and human needs. She lives and works in Berlin.

**Sabine Himmelbach**
Born 1966. Art historian, curator for media-related cultural forms and media art, since March 2012 Director of the House of Electronic Arts in Basel. She studied Art History, Medieval History and Cultural Anthropology at the Ludwig Maximilian University in Munich. She was Project Manager for Exhibitions and Symposiums at the Steinhscher Herbst in Graz and then Head of Exhibitions at Centre for Art and Media (ZKM) in Karlsruhe, where she organised numerous shows and accompanying programmes on contemporary and media-art themes. From 2005 to 2011 Himmelbach was Director of the Ehrlik Rü-Haus for Media Art in Oldenburg.

**Paul Feigelfeld**
Born in 1979 in Vienna. Academic Coordinator of the Digital Cultures Research Lab at the Centre for Digital Cultures at the Leuphana University Lüneburg. He studied Cultural Studies and Computer Science at the Humboldt University, Berlin. From 2004 to 2011 he worked for Friedrich Kittler, one of Germany’s most influential media theorists, whose complete works he also edited. From 2010 to 2013 he was a lecturer and researcher at the Institute for Media Theory at the Humboldt University, first working on his dissertation »The Great Loop Forward. Completeness and Media between China and the West«. He regularly advises museums and festivals, such as the Venice Biennale and the transmediale in Berlin. Additionally, he writes for such publications as 032c, frieze, Texte zur Kunst, PIN-UP, and Modern Weekly China.

**Emyl**
Founded in 2008 by Stefanie Schaade, Valerie Hess, and Raphael Högghammer in Basel, Emyl specialises in designing exhibitions, graphics, video, web, fashion, and interior design. From 2005/2006 they created the first collaboration with Vitra Design Museum as part of the exhibition »Making Africa – A Continent of Contemporary Design«.

**Hug & Eberlein**
The Leipzig-based graphic design studio Hug & Eberlein was founded in 2007 by Nina Hug and Stephan Eberlein. Their work focuses on culture, art, film, architecture, design, and science. Hug & Eberlein created the exhibition graphics for »Hello, Robot«.

**Double Standards**
Founded 2000 in Berlin by Chris Rehberger, Double Standards is a multidisciplinary office active in the fields of corporate, graphic, video, web, fashion, and interior design. The Vitra Design Museum has collaborated with Double Standards since 2013.

Consultants and Designers

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Exhibition floorspace  
800–1200m²

Exhibits  
Everyday and art objects, installations, architectural models, drawings, sketches, illustrations, comics, posters, photograph, films, computer games, web and interaction design.

Curators  
Amelie Klein (Vitra Design Museum), Thomas Geisler, Marlies Wirth (MAK Vienna)  
Consultant: Fredo de Smet (Design museum Gent)

Dates  
Vitra Design Museum: 11 February – 14 May 2017  
MAK Vienna: 21 June – 1 October 2017  
Design museum Gent: 26 October 2017 – 4 November 2018  
The exhibition will be shown in other museums around the world until approx. autumn 2021.

Publication  
Editors: Mateo Kries, Christoph Thun-Hohenstein, Amelie Klein  
Softcover, 25 x 19 cm  
328 pages, ca. 250 images  
€ 49.90 (German retail price)

ISBN 978-3-945852-10-1 (German)  
ISBN 978-3-945852-11-8 (English)

An exhibition of the Vitra Design Museum, MAK Vienna, and Design Museum Gent

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