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OUTRACE

THE PAPER

Robots Land On Trafalgar Square!

NO

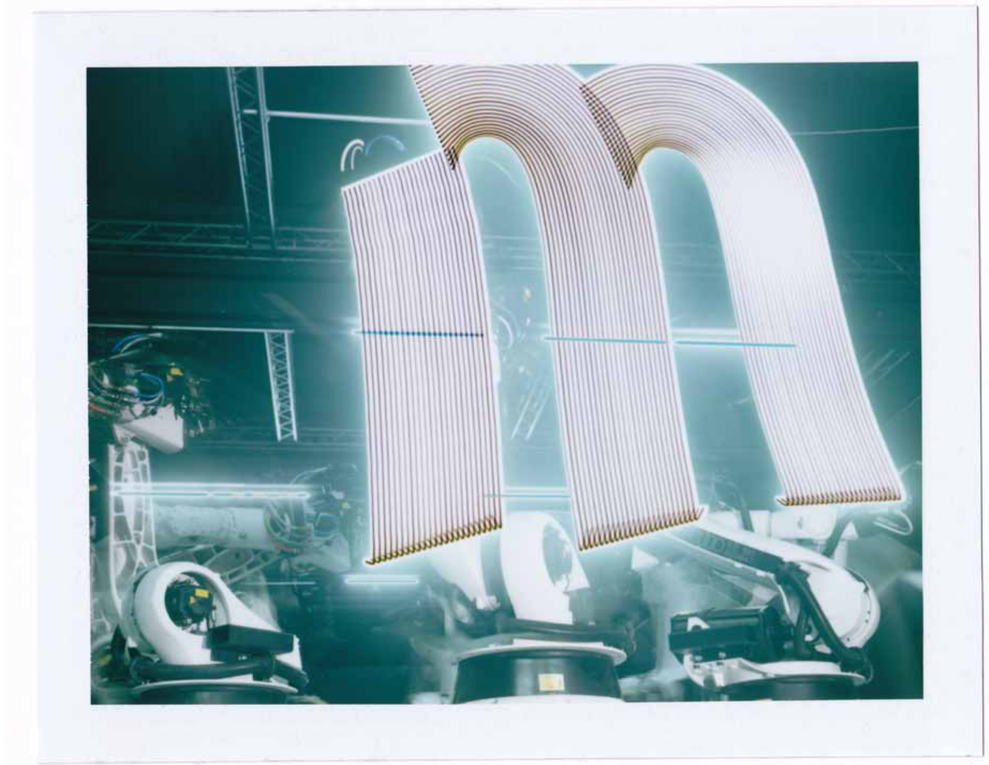
An Installation By Clemens Weisshaar & Reed Kram

COMMISSIONED BY THE LONDON DESIGN FESTIVAL

SUPPORTED AND ENABLED BY Audi

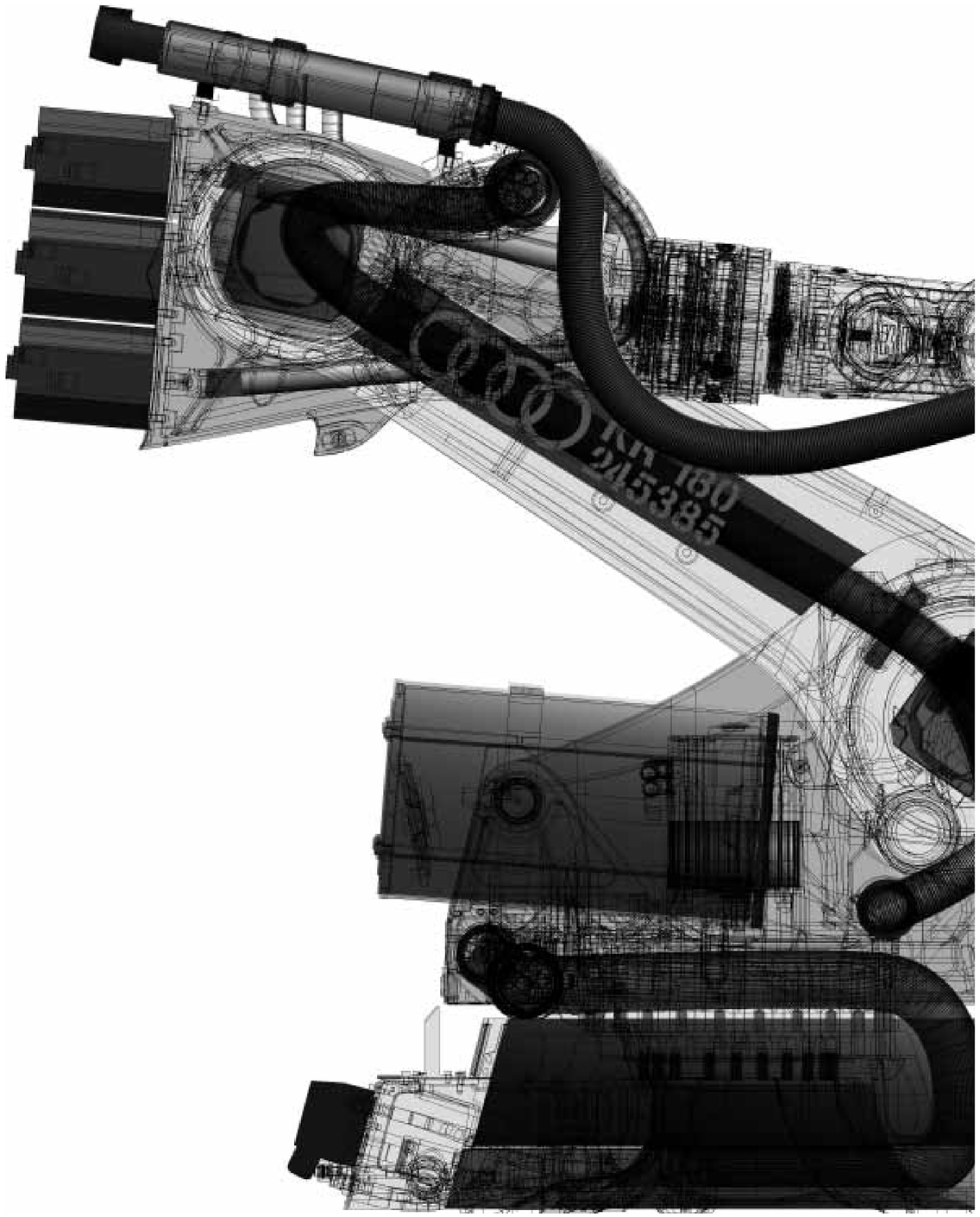
W

The Moving Finger Writes

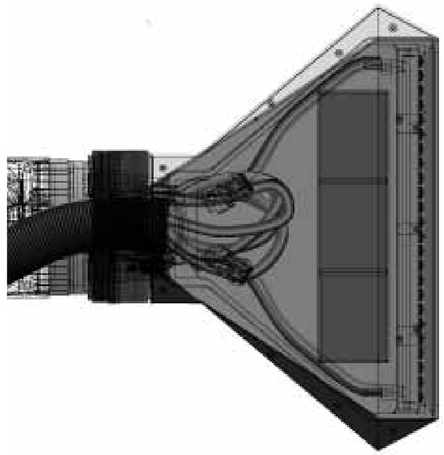


TUNG WULSH

www.outrace.org



The installation OUTRACE consists of 8 large-scale industrial robots on loan from Audi's Ingolstadt production lines. A powerful LED light source is positioned at the tool head of each robot. By logging into www.outrace.org with a mobile device or computer a global audience as well as visitors to Trafalgar Square are empowered to direct the path of the light held by each robotic tentacle, creating a letter trace and text message on this most public square. Long-exposure cameras capture the interactive light paintings and relay them to the project website and social media platforms to be shared.



The Moving Finger Writes

We are presently living in an invisible soup of electronic messages. Commonly, we use our screens to see these messages -- screens the size of our palms, laps, desktops or living-room walls. However, if your media artwork was commissioned by the London Design Festival, you might as well use Trafalgar Square.

In the case of OUTRACE, the installation by Clemens Weisshaar and Reed Kram, the LED screen is wrapped around the artwork s base, busily spooling electronic messages for the public. There are also YouTube videos of every message written by the installation and then sent to computer screens all around the world.

Since this week is the London Design Festival, your city is hosting a lot of professional designers. You will know these genteel people by their office pallor and their dainty Apple iPhones. Reed Kram and Clemens Weisshaar do not fit this mould.

Clemens Weisshaar is one of the few interaction designers who comes directly from metal-bending, lathe-cutting heavy industry. Reed Kram is a rare industrial designer with a background in NASA-grade code and electronics. These two have a history of wrestling with big, complex situations.

So Kram and Weisshaar have chosen to publicly display some weightless electronic messages via massive, heavy-duty industrial machines. By doing this, they are pulling the legs of their fellow designers. They are giving them the ol robot elbow, so to speak. OUTRACE is a designer in-joke for a design festival. And a wickedly hilarious one at that. It is likely the most ponderous and powerfully subversive parody that you will ever see. However, it s also a fine work of public art.

So: what are these robots doing for the public? Well, these grey veterans spent ten years of hard labor welding Audi vehicles. They are tough, blue-collar, one-and-half-ton proletarian workers. They are fast, rugged, powerful, and firmly rooted in colossal slabs of reinforced cement. That safety barrier is there for a reason. After their grueling career of hard labour, these seasoned robots have finally turned to writing. A transcendent urge toward free expression has bloomed in their hydraulics. Enthralled by their brilliant new career in British public art, these robots are whipping out fine calligraphy. They write by using a specially-designed, brand-new, graceful, three-dimensional robot cursive font, designed in the Kram/Weisshaar offices.

These towering, multi-elbowed arms are too big to peck at keyboards, so they are writing with LED racecar headlights instead. Being robots, it s their nature to move at industrial speed. That is why a surrounding ring of thirty-six cameras films their writing and then slows it down for full human comprehension. Just as they once used to collaborate in assembling cars, the robots now work together assembling messages. These messages are brief texts transformed into light-paintings. They are fluid, brush-like inscriptions, written on the very air of London.

Robots have little to say for themselves. Instead, they transcribe: in public, by the public, for the public. These robots write for the many human volunteers who have sent in messages from around the world. They arrive via a website created specifically for this performance: www.outrace.org. As those texts are performed, they are also recorded on video, in a three-dimensional bullet view . These videos are then uploaded to YouTube, and a copy is bounced back to the original author of the message to share with anyone.

As a result, everyone who contributes to OUTRACE gets to see his or her own personal message elegantly performed by public robots in Trafalgar Square. It seems clear they will enjoy that - especially if they ve never seen London.

The OUTRACE robot performance takes place from September 16 - 23. This healthy length of time should mean the performance of some twenty thousand different robot messages. Messages which are accumulating on YouTube as you read these lines!

Now you may well wonder: is it a difficult artistic feat to assemble an eight-limbed synchronized octopus of graphic robots inside Trafalgar Square? It certainly is. OUTRACE took both conceptual daring and careful planning. It required flat-bed trucks and shipping containers, power cables and colossal concrete slabs in addition to technical consultations with the engineers and management of a generously supportive automobile manufacturing company.

But by far the hardest part of the entire effort - and you should know this, because it matters - was the creation of the OUTRACE software. Messrs. Kram and Weisshaar are superb interactive media designers. They are some of the best in the world, and yet, the programming was the hardest nut to crack. Even for a specialised team of digital designers working with robotic experts.

Writing software is an extraordinary process that consists largely of brief lines of code - very short texts, taut and minimal, just a few words per line. Creating it is highly challenging, difficult and often frustrating.

Writing software is our century s version of monumental labor. Software code is all around us and we literally cannot live without it. Without software, even the most powerful robot is immobilised. You can t weigh software, smell it, or see it in action. All you can do is write it, read it, and run it where some people can see.

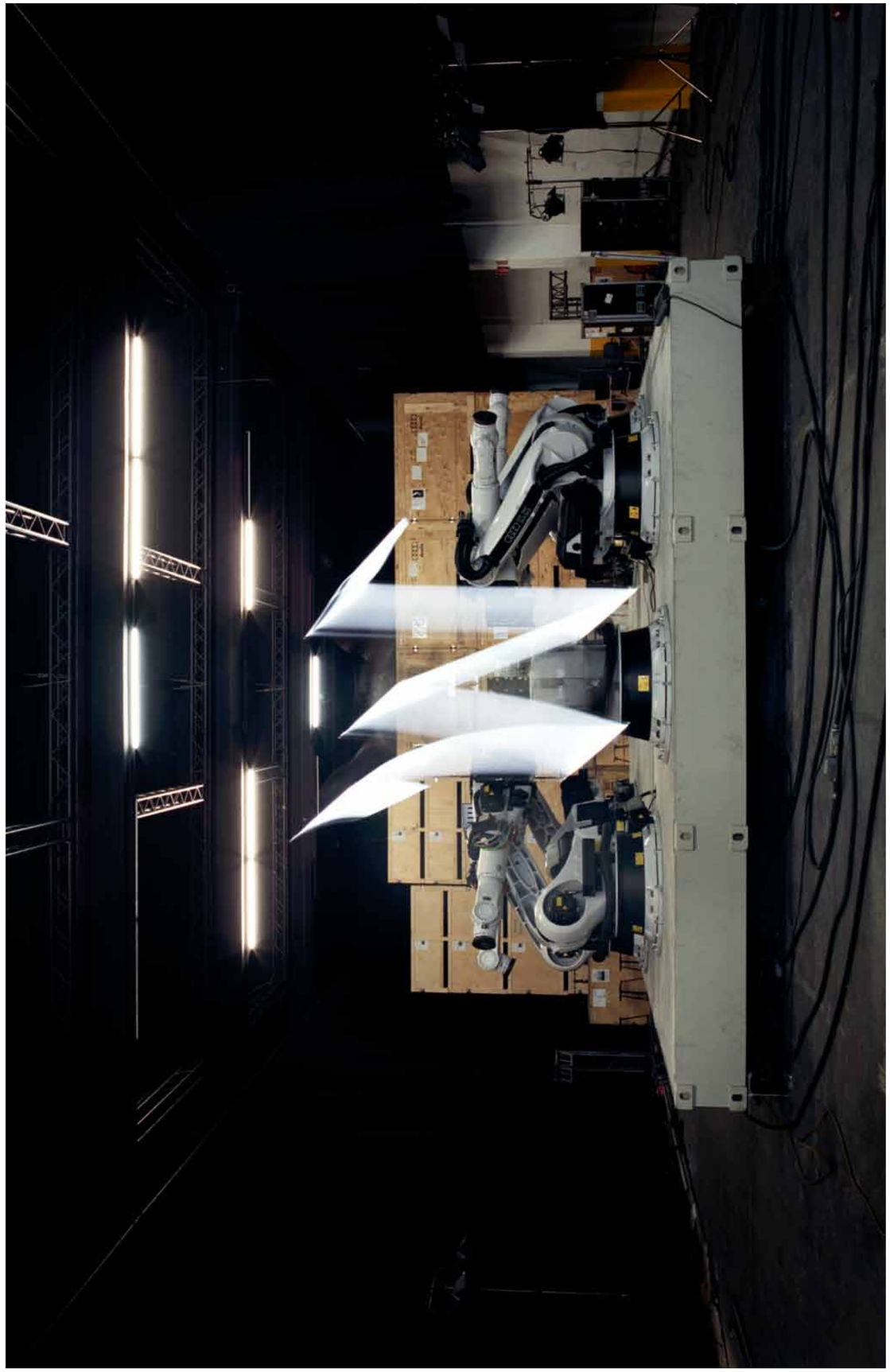
And that is what this project is all about. It lasts for one week. And then, like the festival that commissioned it, it s all over. This massive, whirring installation folds up like a fabric tent. It vanishes forever, leaving no trace but its digital videos. As Omar Khayyam put it, a thousand years ago:

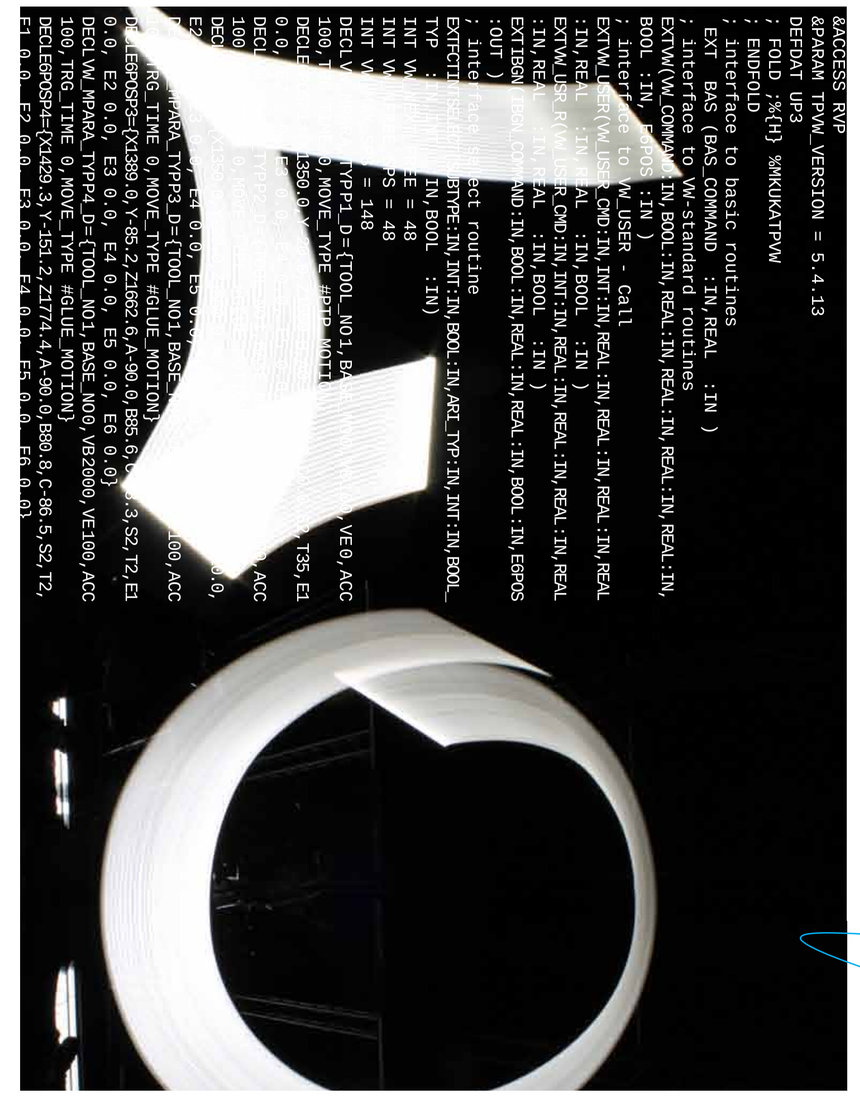
> The Moving Finger writes; and, having writ,
> Moves on: nor all your Piety nor Wit
> Shall lure it back to cancel half a Line,
> Nor all your Tears wash out a Word of it

That quatrain was rather nicely phrased by Omar. His message was pithy, punchy, and built to last. Since it s only 167 characters, that could have been two mobile texts.

Bruce Sterling
Lisbon, Zagreb, Milan,
Summer 2010

JUST AS THEY ONCE USED TO COLLABORATE IN ASSEMBLING CARS
THE ROBOTS NOW WORK TOGETHER IN ASSEMBLING MESSAGES




&ACCESS RVP
&PARAM TPVW_VERSION = 5.4.13
DEFDAT UP3
;FOLD ;%{H} %MKUKATPVW
;ENDFOLD
;interface to basic routines
EXT BAS (BAS_COMMAND :IN,REAL :IN)
;interface to VW-standard routines
EXTVW(VW_COMMAND:IN,BOOL:IN,REAL:IN,REAL:IN,REAL:IN,REAL:IN,
BOOL:IN,E6POS:IN)
;interface to VW_USER - Call
EXTVW_USER(VW_USER_CMD:IN,INT:IN,REAL:IN,REAL:IN,REAL:IN,REAL
:IN,REAL :IN,REAL :IN,BOOL :IN)
EXTVW_USR_P(VW_USER_CMD:IN,INT:IN,REAL:IN,REAL:IN,REAL
:IN,REAL :IN,REAL :IN,BOOL :IN)
EXTIBGN(IBGN_COMMAND:IN,BOOL:IN,REAL:IN,REAL:IN,BOOL:IN,E6POS
:OUT)
;interface to reject routine
EXTFCTI(RSE_BTYPE:IN,INT:IN,BOOL:IN,ARL_TYP:IN,INT:IN,BOOL_
TYP :IN,BOOL :IN)
INT VW
INT VW
INT VW
DECLV
100,T
DECLE
0.0,
DECL
100
DEC
E2
DECLE6POSP3={X1389.0,Y-85.2,Z1662.6,A-90.0,B85.6,C
0.0, E2 0.0, E3 0.0, E4 0.0, E5 0.0, E6 0.0}
DECLVW_MPARA_TYPP4_D={TOOL_NO1,BASE_NO0,VB2000,VE100,ACC
100,TRG_TIME 0,MOVE_TYPE #GLUE_MOTION}
DECLE6POSP4={X1429.3,Y-151.2,Z1774.4,A-90.0,B80.8,C-86.5,S2,T2,
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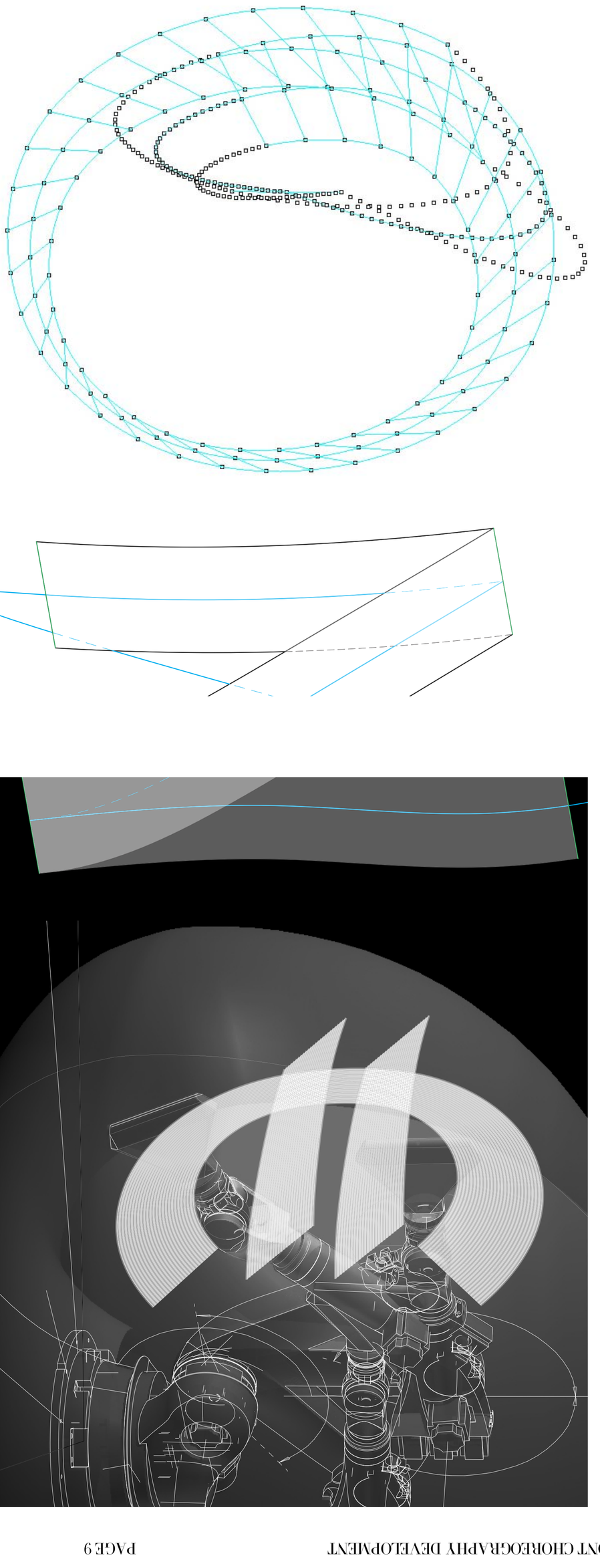
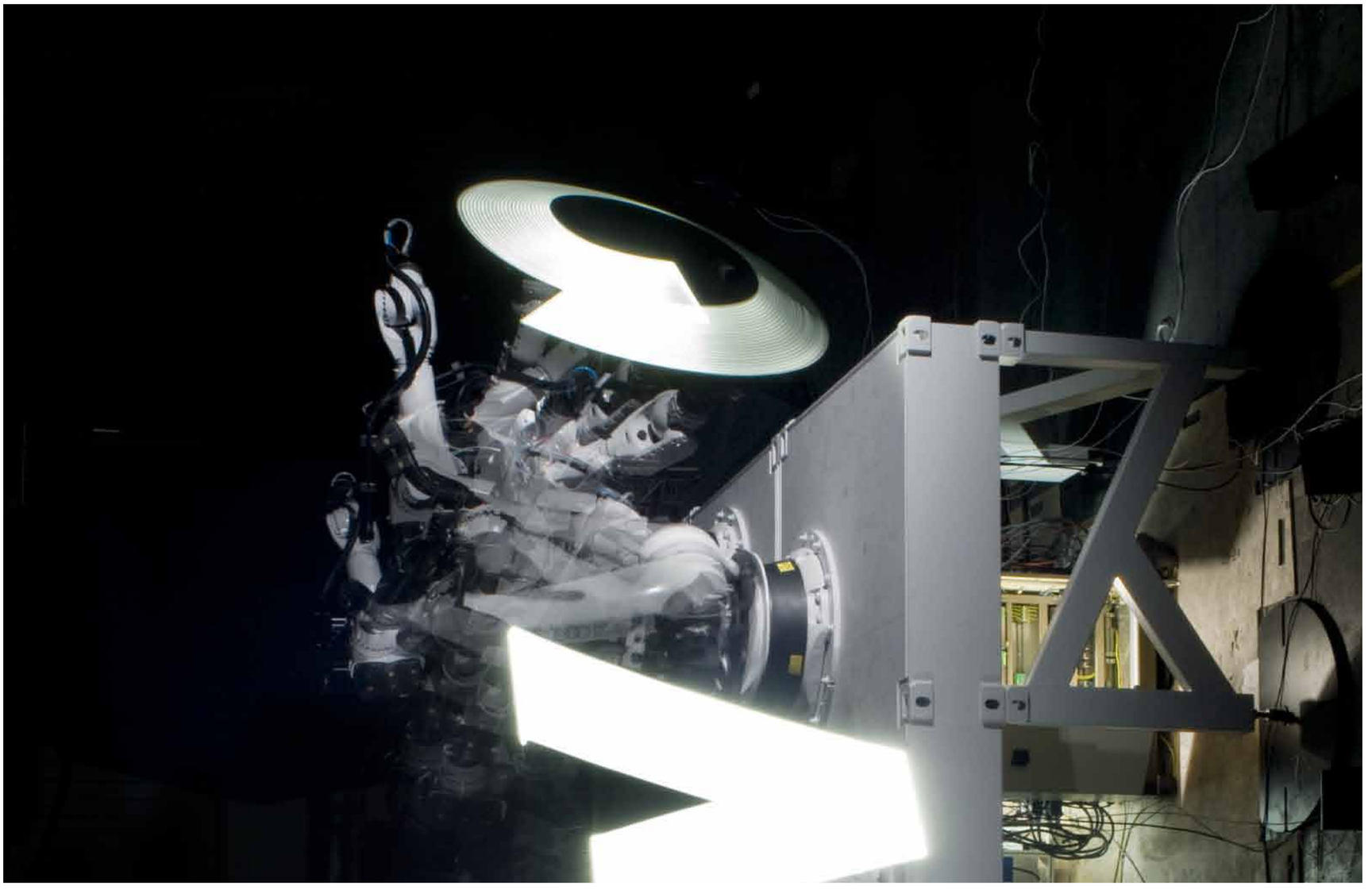




FRANK STOLLE SHOOTS FINAL LETTER TEST IN THE OUTRACE DEVELOPMENT LAB

Six Degrees Of Freedom

Joseph Grima Interviews

Clemens Weisshaar & Reed Kram

JG: I guess the irony of using heavy machinery to manufacture so-mething as immaterial as YouTube videos wasn t lost on you when you first came up with the concept of OUTRACE. Is that the case?

CW: Definitely... In a way OUTRACE is a robotic reality TV show where everyone is invited to be the beast master, the poet and the graffiti vandal. Everyone has to engage, and for that to happen we have to make the hardware as complex and as simple as possible at the same time. The most exciting aspect about robotic car plants is the degree to which the entire process is controlled by human beings, from end to end by the engineers, developers and programmers who conceptualise, code, build and maintain these hypercomplex processes. OUTRACE is an insight into contemporary virtual mechanics a metaphorical robot cell rather than a literal one.

RK: The actual robots are not only powerful objects but also compelling symbols. Although they were created to perform purely functional tasks as quickly and efficiently as possible, they create a wealth of associations and have an instant psychological effect on the viewer that goes far beyond their actual purpose. The public doesn t have to command them in order to take part in the project and to experience their impact on Trafalgar Square.

JG: In OUTRACE, you ve recast the robots as actors performing in front of a virtual audience. In The Work of Art in the Age of Mechanical Reproduction, Walter Benjamin dissects the differences between a stage actor s and a screen actor s performances, their relationships with the respective audiences, and the influence of the camera as mediator between actor and audience. I wonder what Benjamin would have made of OUTRACE...

CW: With OUTRACE, the film set is situated in Trafalgar square, the audience is a remote, global body of individuals, and each member of the audience takes control of the set to produce media for a completely new type of stage that Benjamin couldn t have foreseen: the Facebook wall. The mediatic representation of any object, performance or event is many times more powerful than the physical event itself and OUTRACE is essentially a mechanical device intended to amplify that effect.

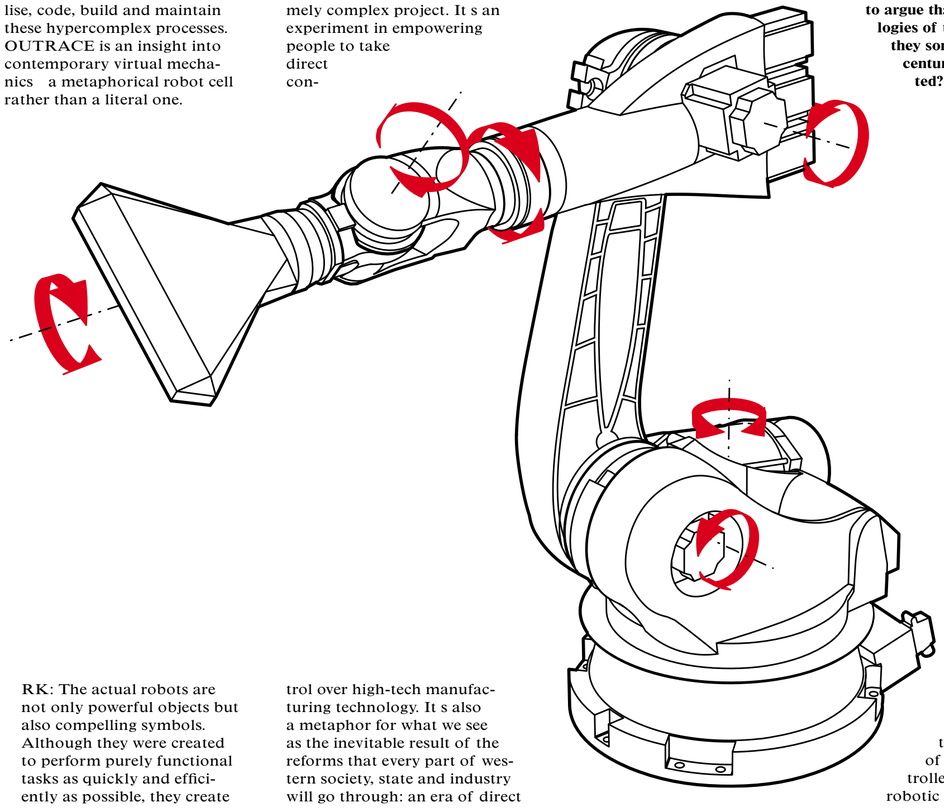
JG: How about the performance-oriented aspect of the installation? In a way the e perience of someone physically present is tantalizingly incomplete, unless they happen to be carrying an iPhone and can interact immediately...

CW: OUTRACE is an extremely complex project. It s an experiment in empowering people to take direct control over high-tech manufacturing technology. It s also a metaphor for what we see as the inevitable result of the reforms that every part of western society, state and industry will go through: an era of direct connectivity.
We see OUTRACE is an evolution of a previous project, Breeding Tables, in which we took control over an industrial process to the degree that we could handle giant steel sheets and bend them with heavy equipment much as one would make paper models. The limitation was that the design process of each table wasn t shared there was no end user involvement in the design decisions.

RK: We ve always worked towards breaking the boundaries of standard production processes underlying physical objects. If you look at how the workspace has changed over the past 20 years, there has been a massive evolution in the way information affects everything in our lives, particularly in terms of physical production. The paradox is that it s become even more impalpable and remote - almost no-one is aware of the complexity of these production processes.

JG: How e actly does this flow of information from user to installation back to user work?

RK: The plinth the robots stand on actually contains an array of servers that receive the 70-character messages being sent by users, and the robots work their way through this queue of messages one by one. I should point out that they re not simply served up - we want to produce great videos, so the team will select the very best of those inputted on the website and the robots draw them consecutively, produce a set of videos and push them back to YouTube and the OUTRACE Facebook group.
Another interesting point is that robots haven t evolved much over the last 20 years neither physically nor in terms of their software. The robots we are using are relatively cheap to buy, but incredibly expensive to programme and therefore to use, simply because programming them is such an esoteric form of knowledge.

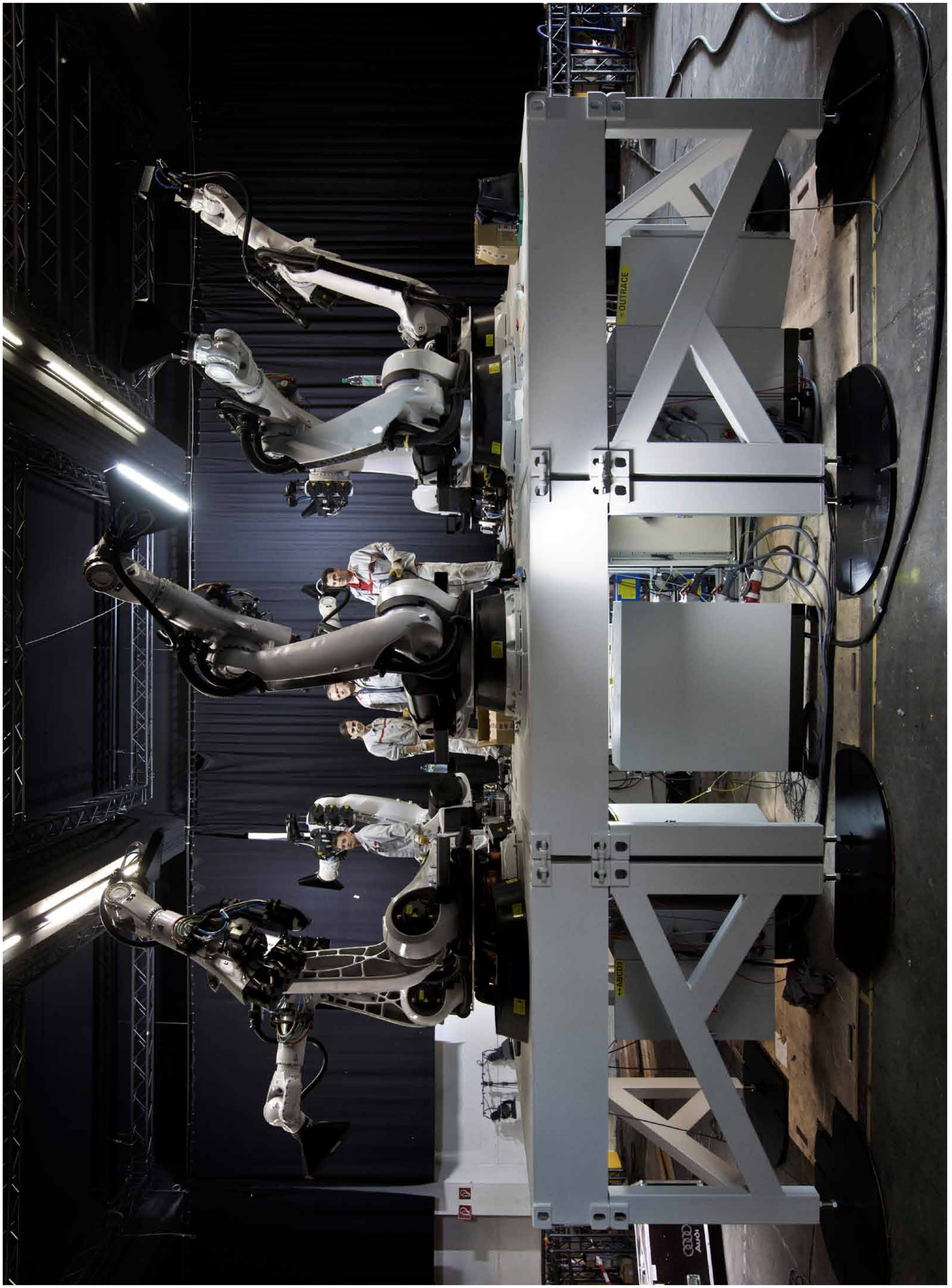


CW: We also see this as a prototype for a future in which we can actually plug into heavy machinery and output products. This is basically what we did with Breeding Tables we tried to achieve a level of control over laser-cutting machines that amounted to the same control you can get over a printer when you attach it to your computer. It s still a very hard thing to do, but in the future we will have machines that can be controlled through processes not dissimilar to when you use an API to tap into information on Facebook. You can mine years and years of development work on code to run a robot in a similar way. The collage of technologies and information in this installation is a virtual presentation of that very direct interaction between the remote user and the factory or, in this case, the robotic manufacturing cell.

JG: After the deflation of the late 90s obsession with just-in-time manufacturing and mass customisation, do you think it s still possible to argue that these are technologies of the future? Aren t they something the 21st century takes for granted?

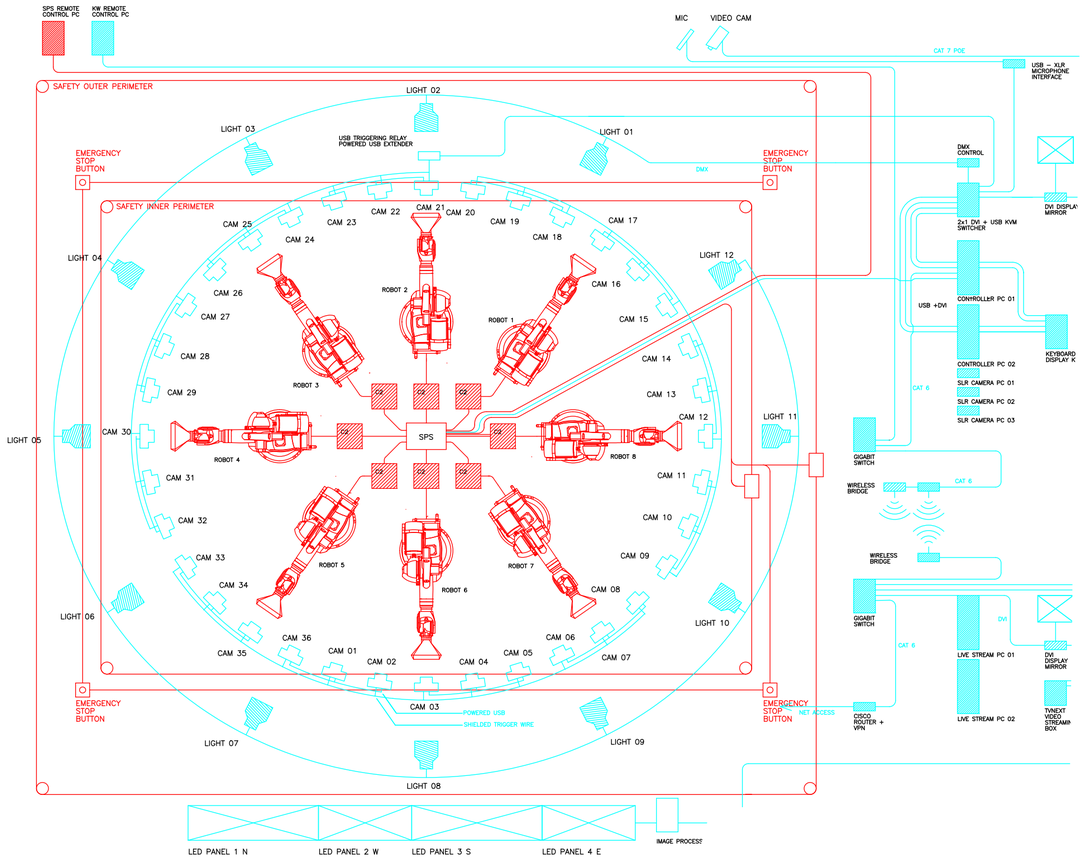
RK: It is only now, in the age of hyperconnectivity, that the potential of numerically controlled machines and robotic automation - both of which have actually been around since the 70s, is being unleashed. And that s where we see huge potential.
The use of these robots is less and less limited by their physical size or strength, or their abilities to manipulate materials, and more and more by the glass ceiling of the programming expense. But in the next few years we ll reach a tipping point, after which the situation will be more similar to that of the personal computer you ll see people hacking small robots or modifying inexpensive devices on their own, simply because they can, and because the methods for controlling them originate more and more in open source code.

JG: Do you think the future of social networking is a greater degree of integration with production and physicality, mechanical processes?



DAVID LEVENE SHOOTS AUDIS ROBOT MECHANICS PAGE 14

OUTRACE



CW: I think you can say that. Take the iconic works of architecture few have seen the real thing. Instead, people have seen image representations of these buildings, and that s true of many forms of cultural production today. 99% of it is media, while the physical buildings are ultimately not that relevant - it s all about the media produced round them. One could almost argue that they need not actually exist in the real world...
We take what the automotive industry already does allowing you to pick and choose the specifics of a product, relying on huge robotic arms to assemble it and essentially do the same for images. When you purchase a car, you spark off a fantastically complex series of processes, each with different implications you trigger effects on the manufacturing cycle, on the supply chain, even on the company s marketing strategy... There are over 20,000 interactions within their systems once you click the buy button for a car. The automotive industry uses these processes on a very large scale, but if you scale that concept down to a more manageable dimension, you end up with something pretty similar to what we have here. We believe that in the next 24 months we ll be able to integrate the production of physical objects, as well as media, into this logic.

RK: This discussion about social media and social interaction can quickly become incredibly didactic, or dogmatic. There s an assumption that as designers our role is to decide the perfect end result, and as a consumer your role is to accept that. The processes emerging today allow for a much more complex scenario - rather than decide one way or the other, we can open up and inhabit the boundary between the designer and the end-user.

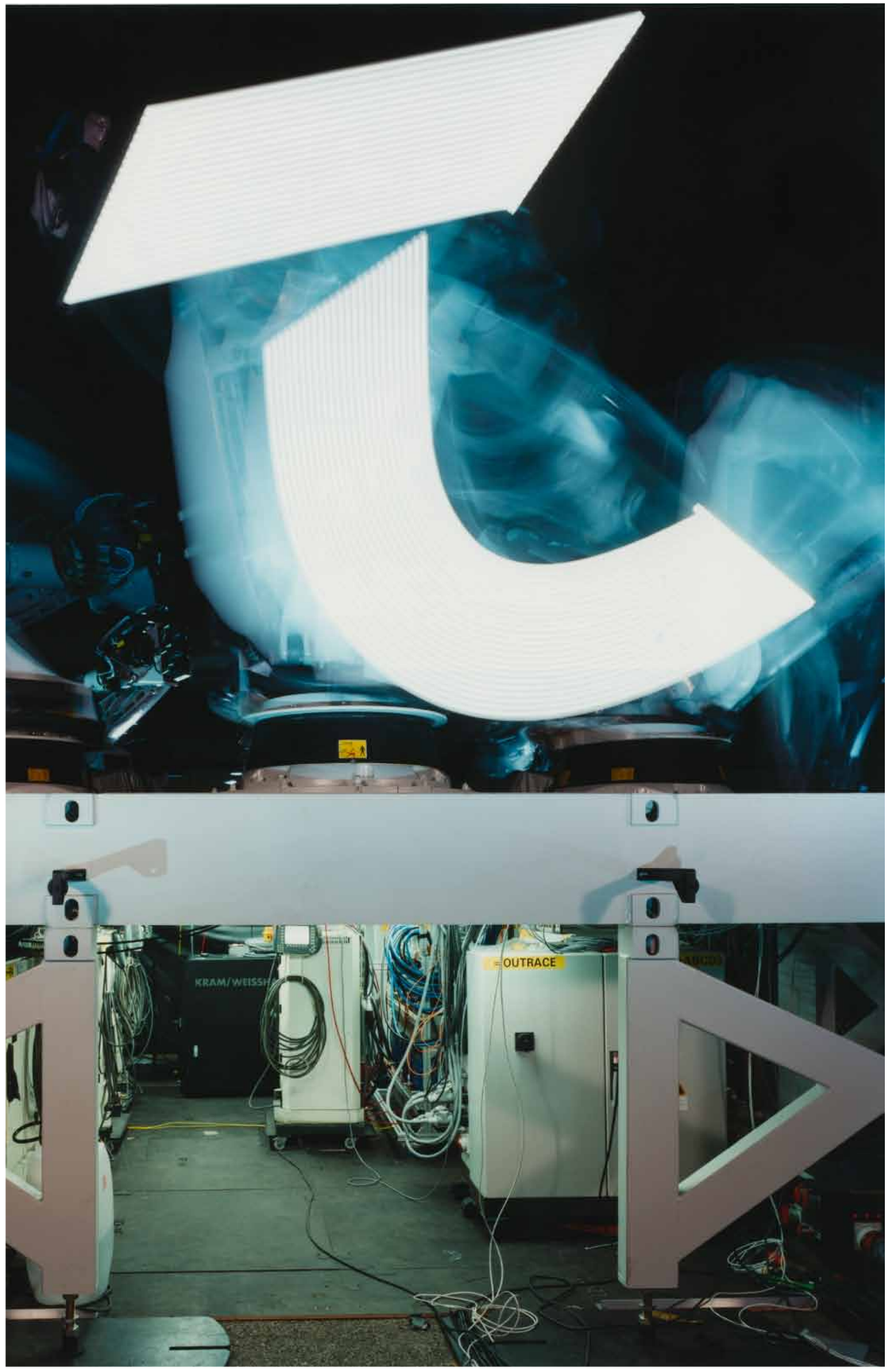
JG: If one pushes that argument to the e treme, what emerges is a new definition of the designer no longer understood as an originator of predefined objects, but a creator of processes through which end-users are able to define their own products. Do you see yourselves as pioneers of this new genre of designer?

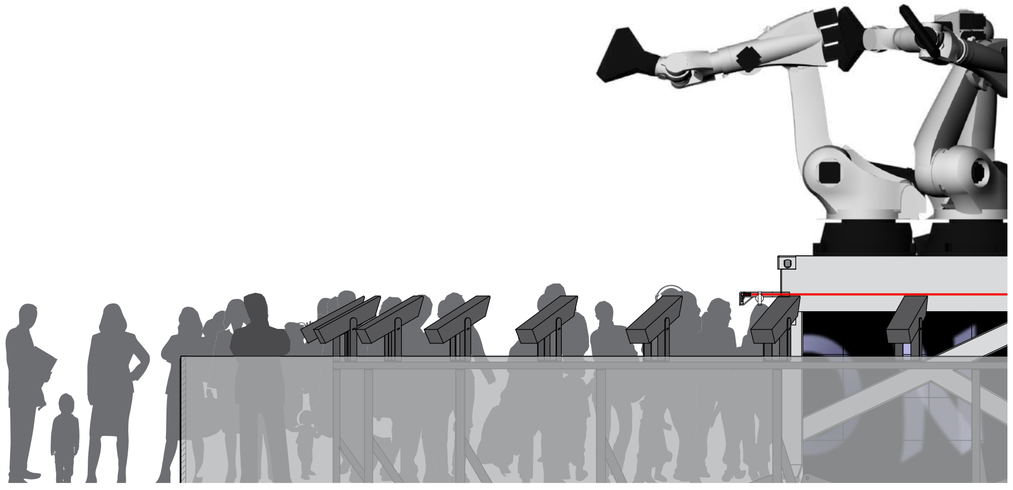
CW: We should be completely clear about this - handing over total control to users, which is something some designers have attempted to do, leads to pretty disastrous results from a design perspective. Instead, end users need to be given the tools, or rather the frameworks to express their individual needs. If you look at Facebook you can see how complex the design of such a participatory framework has already become. However, a framework system like Facebook is still something very different from the broad public taking over the role of the designer.
In the end, a designer can only provide a fragment of real authorship and creative control over the final context and use of his product because unlike a work of art, a design object is inherently functional. The consumer automatically edits both the designer s intentions and framework by selecting and using an item as part of a greater puzzle. The mosaic put together by each end user to create an interior, home or habitat is necessarily unique and greater than the sum of its parts.

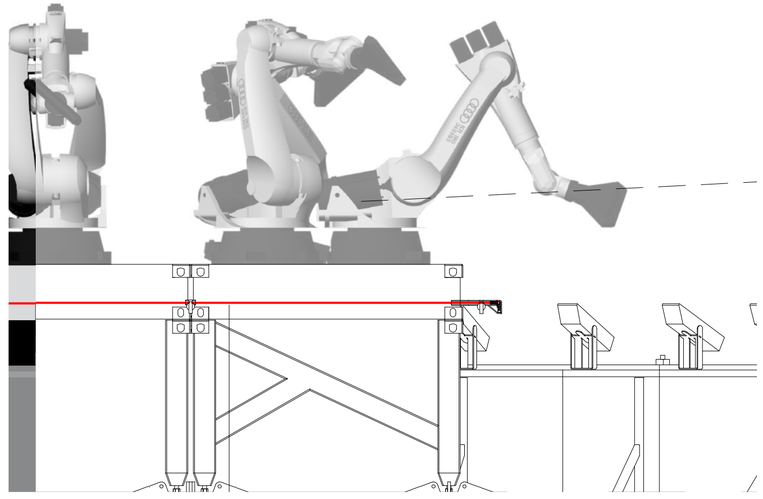
RK: This idea of designing a process rather than standalone product is nothing new, but the speed at which it happens today is radically different. One could say that the modernist project was about defining a process, a software of sorts, or at least a set of rules a kind of programme to run that remade the roles of the designer and the end user. It was an incredibly effective formula and because of that, modernism succeeded in propagating itself. Today the potential landscape for creating design frameworks is much more dynamic and allows for flexibility at every level. Every product has the potential for creating a new relationship between the producer and end user and a new set of rules for defining that exchange in very explicit terms. We already see this very clearly in software. We re only starting to get the taste of it with physical products and architectures.

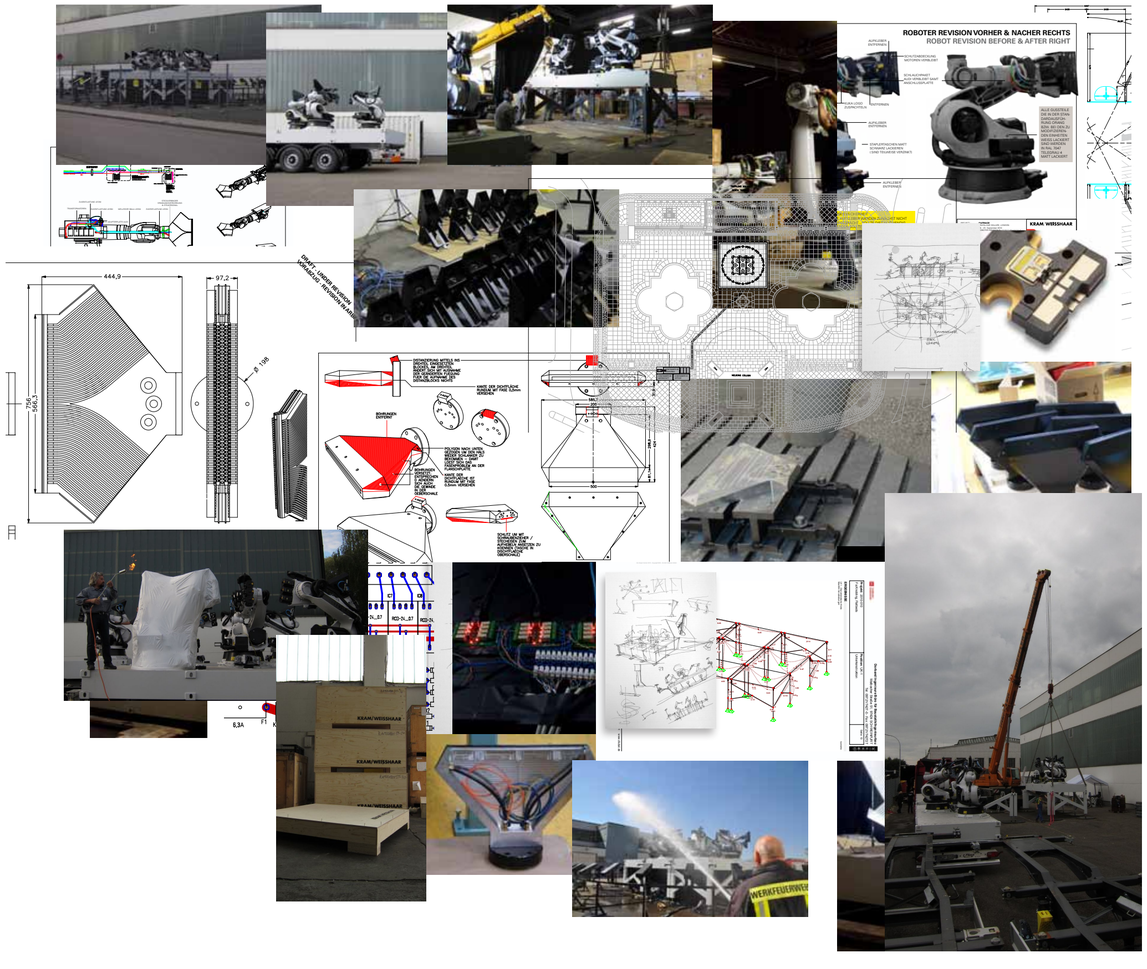
JG: What do you consider to be the criteria of OUTRACE s success as a project in London?

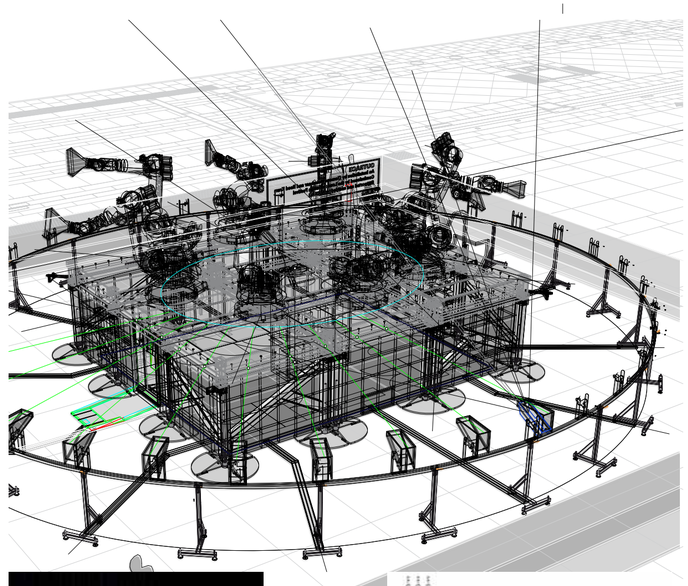
CW: The project s success here will definitely hinge on the extent to which people decide to embrace OUTRACE as a platform and a tool for activism, vandalism, expressions of love, hate and all kinds of personal opinion.

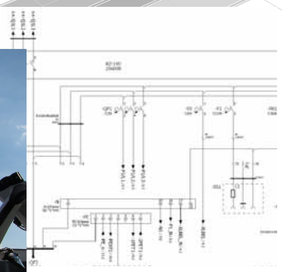












OUTRACE is an installation that consists of

6 independent systems coordinated by

1 KWTC CONTROLLER. A message is processed every

60 seconds. The system is capable of handling over

10.000 messages in a week. The

8 KR180 robots have

6 Degrees of freedom and

6 Drive Motors with a total installed engine power of

182.400W. Each KR180 robot weighs

1287kg with a rated payload of

180kg that can be moved at

229 Degrees per second with the arm fully extended at its maximum reach of

3.1 Meters. Each custom K/W light head contains

24 Philips LEDswith the combined strength of

4 Le Mans-winning Audi R15 race cars that together provide

10 Amperes of light.

3 K/W SLR Camera System (KWSCS) computers capture the motion of the robot light heads by way of

36 SLRCameras connected to

12 USB Hubs, whose signal is then carried by

12 CAT7 cables. The system takes

36 pictures using a

10 second long exposure. The cameras are triggered by

64 reed relays suitable for

10^9 operations transmitted via

36 custom Cat7-to-2.5mm jack plugs. A total of

600 meters of Cat7 cable is deployed.

1KW WEB SERVER is the entry point for the end user. Each video message is encoded at

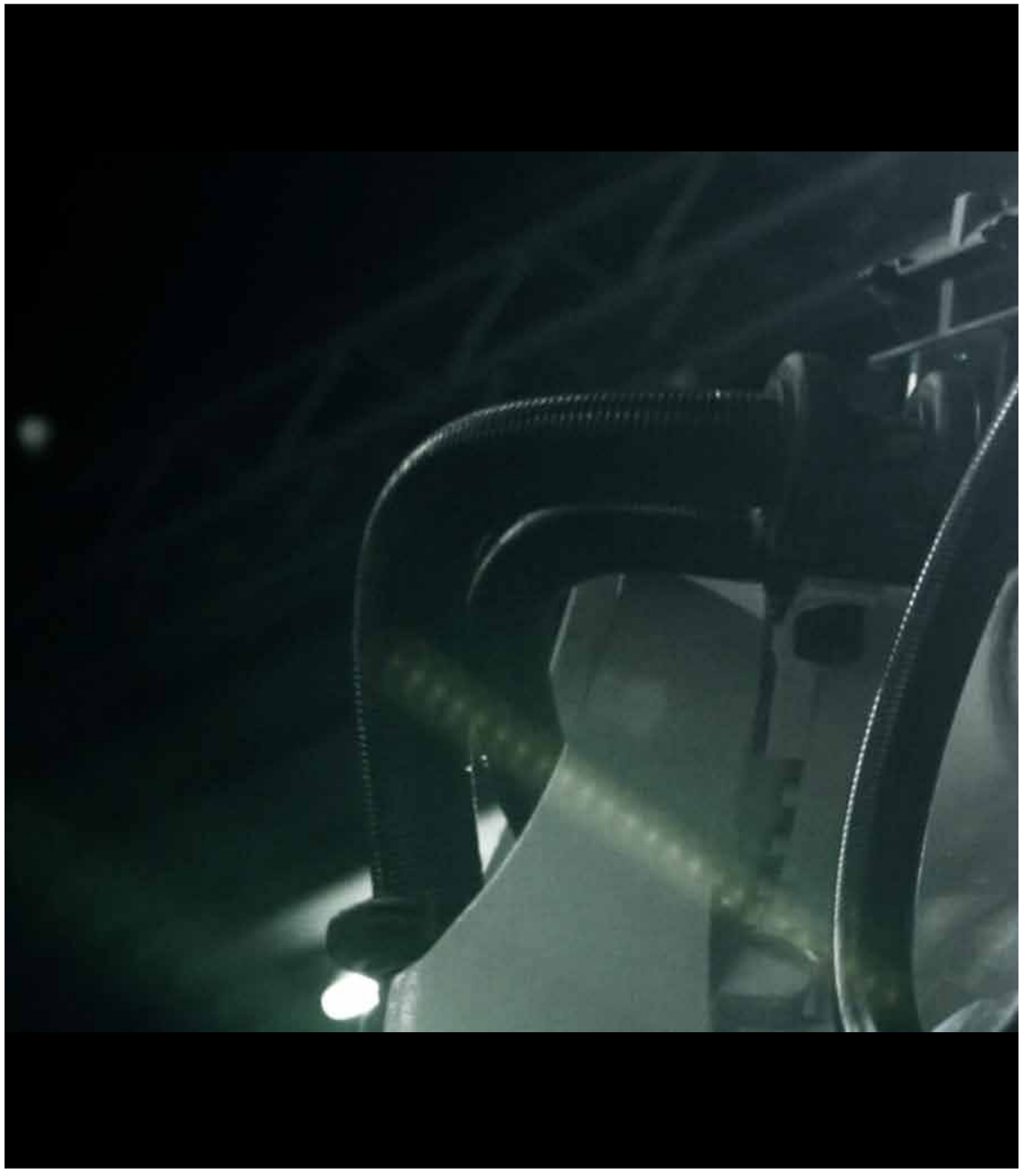
8 frames per second, at a resolution of

1280x850 uploaded to outrace.org and Youtube.

TUNG WALSH SHOOTS BARBORA DVORAKOVA FOR 032C MAGAZINE STYLED BY TAMARA ROTHSTEIN

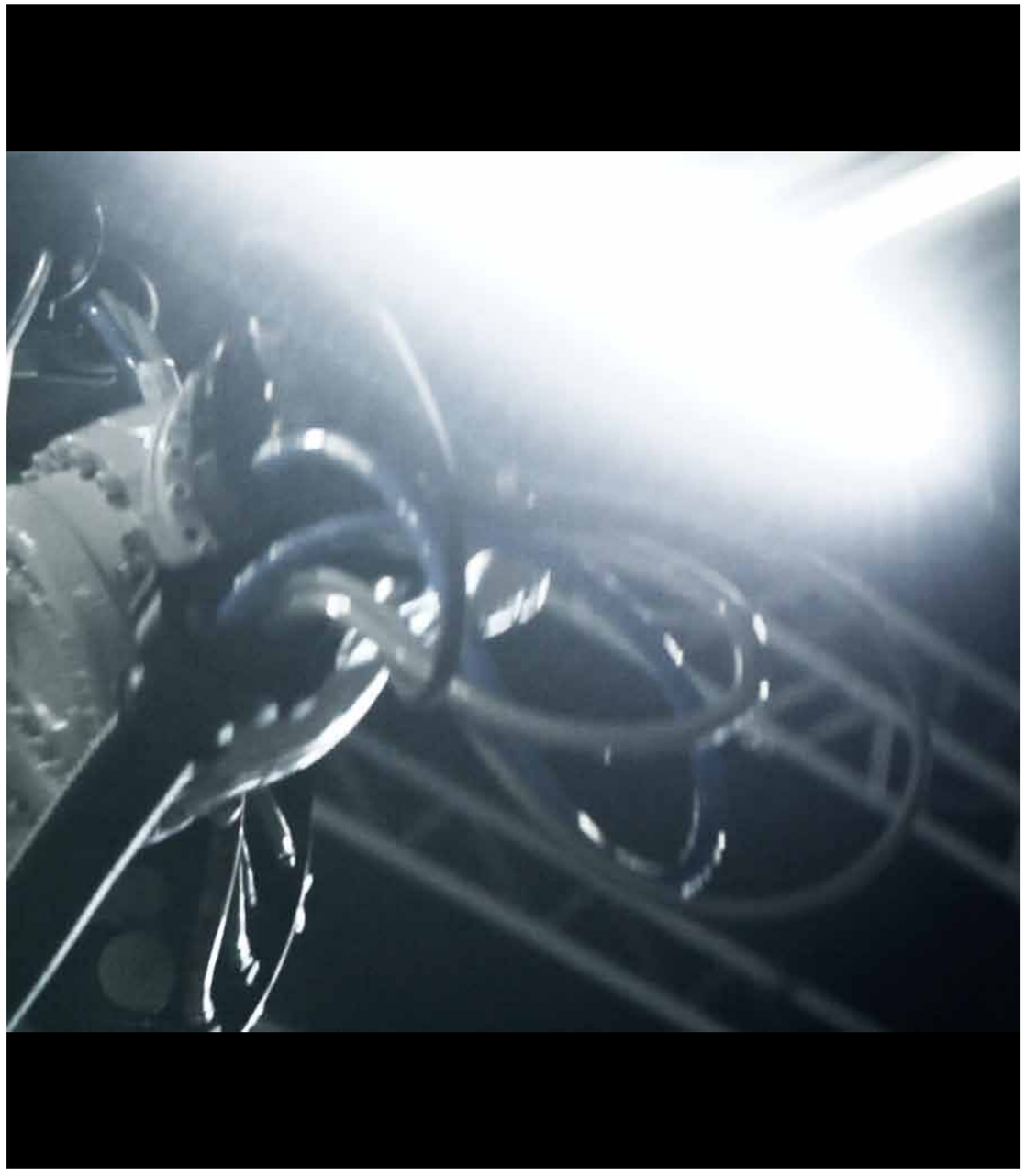
032C AUTUMN / WINTER PREVIEW

O U T R A C E



the Movie

photographed and directed by
Marc Comes
www.outrace.org/themovie



It is the year 2010. Robots are connecting parts along a conveyer belt. No people.
The rhythm of machines pulsating. A high end hotel with fabric covered walls. A kiss.
A long intense kiss. Fluids. Robots are building cars. Permanently moving at the same pace.
Loud but also soothing. Marching band music. A parade in London.
I hate central London. Central London is a theme park.
A black warehouse. A secret place. Robots awaken. Light up. Pneumatic Sounds.
Exhausted bodies. Close together, soft and slick. A breeze. Machines moving across the ocean.
White froth on the water. A Learjet rises through the fog above Heathrow. She sips from a straw.
Robots stand in a circle on Trafalgar Square. Nelson is crisscrossed by lines of light. A ballet. A moon landing.
OUTRACE The Movie.

Liberation Theology

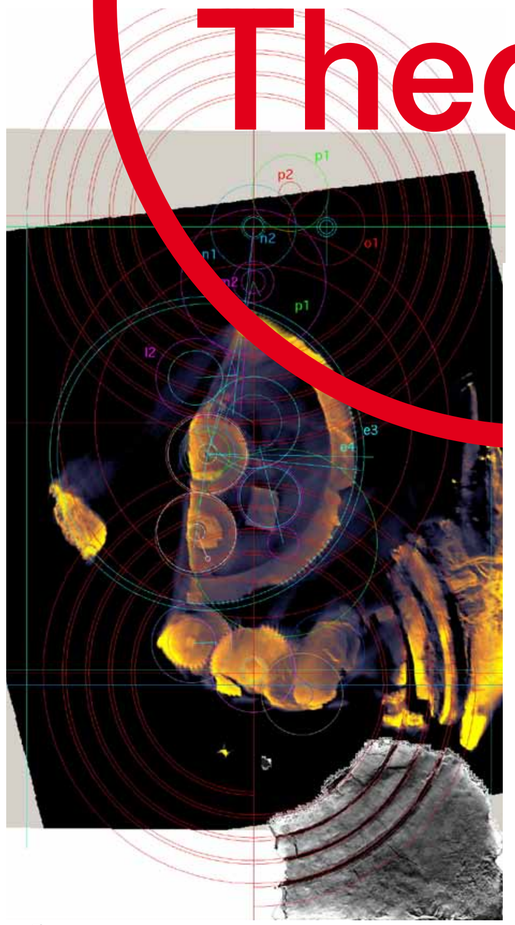


Diagram of Back Dials of Antikythera Mechanism © 2006 Antikythera Mechanism Research Project http://www.antikythera-mechanism.gr

When experiencing the hypermodern OUTRACE installation, you may be surprised to hear that the Romantic poet Edgar Allen Poe also held strong opinions about the identity of automatons. Poe felt that automatons, the earliest of robots, could never be considered pure machines, but would always require a relationship to human agency . Evidently, this debate requires some prior insight into the history of robot intelligence . Philosophically speaking, OUTRACE, the Weisshaar/Kram project commissioned by the London Design Festival illuminates astonishingly complex issues about crossing identities between humans and machines.

The discussion of intelligent machines dates as far back as Pindar, one of the nine lyric poets of ancient Greece, からくり人形 and Karakuri ningyō; in particular the mechanized automatons designed and built by Tanaka Hisashige (1799 1881) during Japan s Edo period. Then there is Henri Maillardet, (1745-?) who produced a number of automata, including the so-called Maillardet s Automaton, and Nepomuk M lzel s invention: The Chess-Player of M lzel (1772 1838), Johann Wolfgang Ritter von Kempelen de P zm nd (1734 1804), who originally designed and built the Chess-Player of M lzel, the duck of Vaucanson, and not least Edgar Allen Poe, Clemens Weisshaar and Reed Kram.

This story begins unexpectedly with the 1901 discovery of the Antikythera mechanism, the ancient (150-100 BC) mechanical computer designed to calculate astronomical positions. Incidentally, Professor Michael Edmunds, an expert on its mechanical structure, called it more valuable than the Mona Lisa . Although it is no longer believed that the Antikythera device originated from Rhodes but came instead from a Corinthian culture, there were long told stories that the ancient residents of the island of Rhodes were not only capable of innovative engineering, but had also created automatons.

There had already been tantalizing hints; Pindar had written of Rhodes in his seventh *Olympic Ode:*

The animated figures stand
Adorning every
publicstreet
And seem to breathe in
stone, or Move their
marble feet.

A young robotic man dips his brush into ink

Geppetto dresses Pinocchio. Illustration by Carlo Chiostri (1863 - 1939) from the book "Le avventure di Pinocchio", 1901

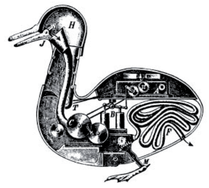
Automatas comes from the Greek αὐτόματος, meaning to act on one s own will, and generally refers to autonomous machines that simulate human or animal behavior, like a cuckoo clock. But essential to this early definition is the notion that these automatons (robot was coined in 1921) would simulate the freewill which grants each individual self-determination or the right to act independently, thereby gaining dominion over his or her own destiny. Sounds good - doesn t always work out; as the story goes, God granted Adam and Eve freewill to take their own moral decisions while respecting his eternal laws, and everyone knows how that one ended. Nevertheless, this is no small matter because the goal of the early auromatons, and later robots would be to simulate what it is to be essentially human, and at the very least, appear to exercise freewill, Pinocchio like, but freewill nevertheless. That is a grand ambition by any standard; but it partly accounts for our breathless fascination with robots whether they have been designed to make drawings or ride bicycles. These early automatons are the distant relatives of the eight robots that populate OUTRACE and while thematically and genetically related, there are significant evolutionary differences between them worth exploring.

Since the appearance of the earliest automatons, their creators have tried to endow them with the ability to create of their own accord, just as Weisshaar and Kram have blessed the OUTRACE species of robots with the ability to draw and write in light. Why? Perhaps because language and artistic creativity is exclusively human we share song with the birds and play with the monkeys but speaking and creating art represents the turnkey to being human. Demonstrating both reasoning and creativity is perhaps the best chance for machines to pass as human or at least seem in the most fundamental sense to be human. The robot passing as human riddle raised nerve-racking doubts in Blade Runner as Rick Deckard tried to parse Replicant from Human. Significantly, the ambition for automatons to write and draw is found not only in

この文字書き人形は
1840～1850年に
田中久重が制作
したものですが、
実は最近まで、
その存在は国内で
知られていませんでした。

the West, but in the tradition of Japan s Karakuri ningyō; a particularly impressive example being the calligraphy writing automaton constructed more than 150 years ago by Tanaka Hisashige. In this well known example, a young robotic man dips his brush into ink and then onto a sheet of paper draws the kanji character for kotobuki meaning blessing or longevity. Effortlessly, this hybrid form of drawing and writing delights his audience time and again. Different from the Greek αὐτόματος, the word karakuri literally translates as a mechanical device designed to tease or trick; yet both traditions, the automaton and Karakuri ningyō are designed to create an ambiguous relation between the pure machine and what Poe called human agency, including human interaction with the machine. These are important distinctions to consider in order to fully grasp the implications of OUTRACE.

The western companion piece to Hisashige s automaton, built around 1815, would be Henri Maillardet s Automaton of 1805. Maillardet s automaton could draw four intricate pictures of ships and Chinese palaces, write three poems in both French and English, and then, after the third poem, would confess in writing: Ecrit par L Automate de Maillardet, thus freely admitting it hadn t a shred of freewill, having been built and programmed, if you will, by Maillardet. And then, there was the widely celebrated automaton designed, not to simulate the freewill of humans, but the instinct and anatomy of animals, or in this particular case a Canard Dig rateur or Digesting Duck. Built in 1737 by Jacques de Vaucanson, the duck had more than 400 moving parts and could flap its wings, play in the water making gurgling sounds, rise up, lie down, and most notoriously gobble down grain and corn whereupon Vaucanson claimed that it would metabolize and then defecate its food. Of course no actual digestion took place and Vaucanson s fraud was found out by 1783. But for a while the Vaucanson duck was a celebrity; even Johann Wolfgang Goethe met the duck, though long after its fame had faded. The poet, in his 1805 diary, unceremoniously records that: The duck was like a skeleton and had digestive problems. . . With tongue in cheek, Voltaire too mused over the duck: Sans . . . le canard de Vaucanson vous n auriez rien qui fit ressouvenir de la gloire de la France (Without the duck of Vaucanson, you have nothing to remind you of the glory of France).



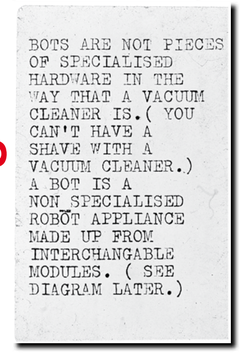
Duck of Vaucanson (1738-1739)

While the claims made for the duck s digestive tract were fraudulent, the Canard Dig rateur was at the same time an example of some remarkably advanced simulations of animal behavior and physiology which served the Cartesian idea that animals were simply machines made of flesh.

Fueled by what is often the double-edged addiction Americans have to Puritanism, Edgar Allen Poe stripped bare the truth about M lzel s Chess-Player in an 1836 article by the same name, published in The Southern Literary Messenger. While highly elaborate in his descriptive passages of automatons - included is the duck of Vaucanson - Poe was never more critical than when he began a forensic description designed to cross-examine, with devastating results, M lzel s performance with the Chess-Player. His analysis produced the juice of any good detective story where the protagonist exposes and then sets right a moral wrong; in this case M lzel s carnie deceit with his partner-puppet, the Turkish chess player. Poe s natural assumption was that the Chess-Player could never be what M lzel claimed, a pure machine, thinking for itself and he was of course right. Does this mean that Poe would have also denied future robots, such as the IBM computer Deep Blue any real autonomy? This particular computer system beat the world chess champion Garry Kasparov in 1997. And yet despite its advancement from what Poe called a pure machine, it remains open to discussion whether it could ever evolve beyond the algorithms programmed into it by humans. That Poe didn t see Deep Blue coming is forgivable since it is unlikely anyone could have accurately imagined the type of machines available to future generations. Nevertheless, one must add that he was still very aware of the profound implications of M lzel s device. He boldly pointed out that if the Chess-Player really was unconnected with human agency in its movements it would be beyond all comparison, the most astonishing of the inventions of mankind. Correct Mr. Poe, meet Deep Blue, not to mention I.B.M. s current treasure, Watson.

Image of a copper engravingfrom Karl Gottlieb von Windisch's 1783 book (Briefe über den Schachspieler desHrn. von Kempelen, nebstdrei Kupferstichen diediese berühmte Maschinevorstellen.)

The Chess-Player was not a pure machine interacting with a human, but simply a conduit between whomever was concealed inside the contraption and an innocent challenger from the outside world, who together would play a game of chess. This distinction reduces the machine to a rickety sideshow gimmick, far less interesting or even entertaining than the duck of Vaucanson. Vaucanson himself claimed that he originally set out to design an automaton digestive system, but had failed, and perhaps Johann Wolfgang Ritter von Kempelen de P zm nd, who designed the Chess-Player, had aimed higher too, toward a kind of mechanically produced artificial intelligence, rather than vaudeville magic.



David Greene / Epherma / Projector Left 8 / 013 - BOT - Non Specialised Robot, The Archigram Archival Project © David Greene

Goethe: "The duck was like a skeleton and had digestive problems"

For the most part, however, Poe had it right; granting an automaton the appearance of freewill, or even instinct would be a matter of instrumentalising human agency in the first instance. And this would apply to OUTRACE equally, except that Weisshaar and Kram have another and more evolved agenda which creates an open-ended system where robots and humans interact, collaborating together as equal partners to produce their intangible content as text and images. Interestingly, Archigram took a collaborative approach towards integrating robots into their speculative projects. Both in the case of Instant City Robotower, 1968 and in a 1967 exhibition of what a future home might be like in 1990, they included audio-visual robots that would collaborate with their audience. It s also worth mentioning that in the Archigram archive we find images of both the Chess-Player and the duck of Vaucanson. That OUTRACE s intangible output is exclaimed in light, only visible because of the ring of cameras in Trafalgar Square capturing it in so-called bullet time, makes its own exquisitely fine point. It is a form of co-design where the humans take care of ideation and the robots execution. Poe could not conceive of such a partnership but only a hierarchy naturally dominated by human agency, but then, this is still the norm, isn t it? On just this one point of difference, Weisshaar and Kram provide us with a breakthrough idea about our future with robots and the computer programmes that run them.

In OUTRACE, the eight robotic beasts, originally designed and programmed to perform the repeated tasks that would endlessly produce the same automobile, have been unshackled by Weisshaar and Kram s liberation theology allowing the techniques and tools of mass production to be put in the service of individual creativity. This theology, the belief system that would mass produce something unique, initially materialized in some of Weisshaar and Kram s best known work including the Breeding Tables. In this series, one-of-a-kind tables were manufactured using highly sophisticated machinery liberated from the production line. Each Breeding Table was generated using elaborate algorithms to selectively breed successive generations of tables from highly evolved designs originally chosen by Weisshaar and Kram. OUTRACE shares with the Breeding Tables the answer to the arch puzzle Weisshaar and Kram were to solve: How to mass produce the original. With OUTRACE the difference is that they activate a mishmash of DIY, social media and co-design so that a global audience, using different interfaces (the OUTRACE website or by downloading iPhone or iPad applications), can send text messages to the OUTRACE system which directs the robots in Trafalgar Square to create them for the larger public. It should not pass unnoticed that like Hisashige, Maillardet and other pioneering automaton designers, Weisshaar and Kram sustain words and images, two of the most essential forms of human expression, as the prime content for OUTRACE. To underscore this legacy OUTRACE will draw the kanji character for kotobuki meaning blessing or longevity just as Hisashige s calligraphy writing automaton first did in 1860.

OUTRACE is a game-changer in terms of its potential to enable a type of freewill in a machine and thus create a cyclical exchange between man and robot. It is an open invitation to exercise individual freewill, stepping over the line marked audience to become a citizen-designer. Notably OUTRACE robots don t simulate humans or animals, but rather live up to their own standard of efficiency and mastery noticeably absent in the other two species. Following on from this, is it fair to say that the OUTRACE system has its own form of freewill? Over time, the system will gain new capabilities as it adjusts strategies fulfilling the collaborative objectives shared with its human counterparts, executing their streaming texts and designs. It will adapt on its own, without human intervention, learning to make future decisions based on past experience. In the fullness of time, the robots will become even more expert at what they do. Does this mean that they are having experiences with their human partners? Do androids dream of electric sheep?

Ronald Jones
Beijing, Palo Alto,
Stockholm, 2010

TAKE

R

MY TRACE - YOUR TRACE - OUTRACE

I.

Go to www.outrace.org and tell the robots what you are thinking in 70 characters or less. Be creative, be simple, be clear, be subversive, be honest, be poetic, be naughty, be yourself, be funny, be serious, be thoughtful. Be part of OUTRACE. The only condition is that you leave your name/alias and an email address to receive your personal OUTRACE video.

II.

If your message is drawn, the robots will write for you, the cameras will film for you and OUTRACE will send you your custom made video to share with your friends and the rest of the world.

OUTRACE is YOUR TRACE

OUTRACE

The OUTRACE installation contains 8 large-scale industrial robots on loan from AUDI s automotive production line. A powerful LED light source is positioned at the tool head of each robot.

By logging in to the online control website with a mobile device or computer a global audience as well as visitors to Trafalgar Square are empowered to direct the path of the light held by the robotic tentacles, each creating a letter trace recompiling the user s text message. Long-exposure cameras capture these interactive light paintings to the project website and social media to be shared.

OUTRACE is a popup factory: a temporary production facility for writing large scale messages with light in three dimensions.
These seemingly implausible machines, pulled from the pages of a science fiction novel, are in fact ubiquitous throughout high tech production facilities. Removed from their everyday context behind factory walls and taken onto a trip to London s most public square they become mighty ambassadors from a foreign land within our midst that produce the goods we use and the cars we drive.

www.outrace.org

Supported And Enabled By Audi AG

AUDI AG marked its centenary in 2009. The Vorsprung durch Technik brand is inextricably linked with progressiveness and the legendary quattro 4-wheel-drive system as well as 9 Le Mans victories. The Audi range has risen fast since 2000 from 17 to 36 types and has long been deeply linked with advanced design and the obsession and dedication to creativity is omnipresent in its entire range. In 2009 Audi has shipped 950.000 cars.

www.audi.de

Commissioned by The London Design Festival

First staged in 2003, the London Design Festival is one of the world s most important annual design events. The nine-day Festival programme is made up of over 200 events and exhibitions staged by around 160 contributing - or partner - organisations across the design spectrum and from around the world.

The site on Trafalgar Square has been provided to the London Design Festival by The Greater London Authority Events for London.
Sudeep Basu

www.thelondondesignfestival.com

The Designers Clemens Weisshaar and Reed Kram

Reed Kram and Clemens Weisshaar founded KRAM/WEISSHAAR in Munich and Stockholm in 2002. The firm engages in the design of spaces, products and media and collaborates with designers, architects and engineers from Germany, Spain, Sweden, the UK, the US and Japan.

Key projects include the design and implementation of the technology projects for Rem Koolhaas Prada Epicenter Stores in New York City (2001) and Beverly Hills (2004); projections for the Prada Women s Fall Fashion Show in Milan (2004); BREEDING TABLES (2003 - ongoing); TRITON bar stool for Classicon (2006); MY PRIVATE SKY (2007) for Nymphenburg, the design of the western section of Carsten H ller's The Double Club bar, restaurant and nightclub in London for Fondazione Prada (2008-2009), HYPERSKY (2009) and INFINITE DISPLAY (2009) permanent Media Installations for private Collectors and now OUTRACE (2010).

Weisshaar and Kram s work has been exhibited worldwide and can be found in the permanent collections of The Museum of Modern Art, New York, the Centre Pompidou, Paris, Fondazione Prada, La Triennale di Milano Design Museum, Pinakothek der Moderne, Die Neue Sammlung M nchen and the Vitra Design Museum.

In 2008 Kram and Weisshaar were named Designers of the Future by Wallpaper* Magazine and Design Miami/Basel.

OUTRACE has been conceptualized and designed by Clemens Weisshaar & Reed Kram with Carles Tom s Mart', Khashayar Naimanan, V'ctor Garc'a Fern ndez, Mino Kodama, Luis Maqueda Ara, Janina Joffe

Produced and programmed by
KRAM/WEISSHAAR AB
www.kramweisshaar.com

Robots and Robotic Systems
AUDI AG

Mechanical Engineering and Manufacturing
Sven Knobling with Thomas Orth, Tobias Eyerkaufer, Uwe Doering, Tobias Barth, Christoph Haas

Local London Production
The London Design Festival
Ben Evans, Ruth Dillon

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OUTRACE PAPER is edited by Janina Joffe and designed by Mirko Borsche

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032c
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KRAM/WEISSHAAR

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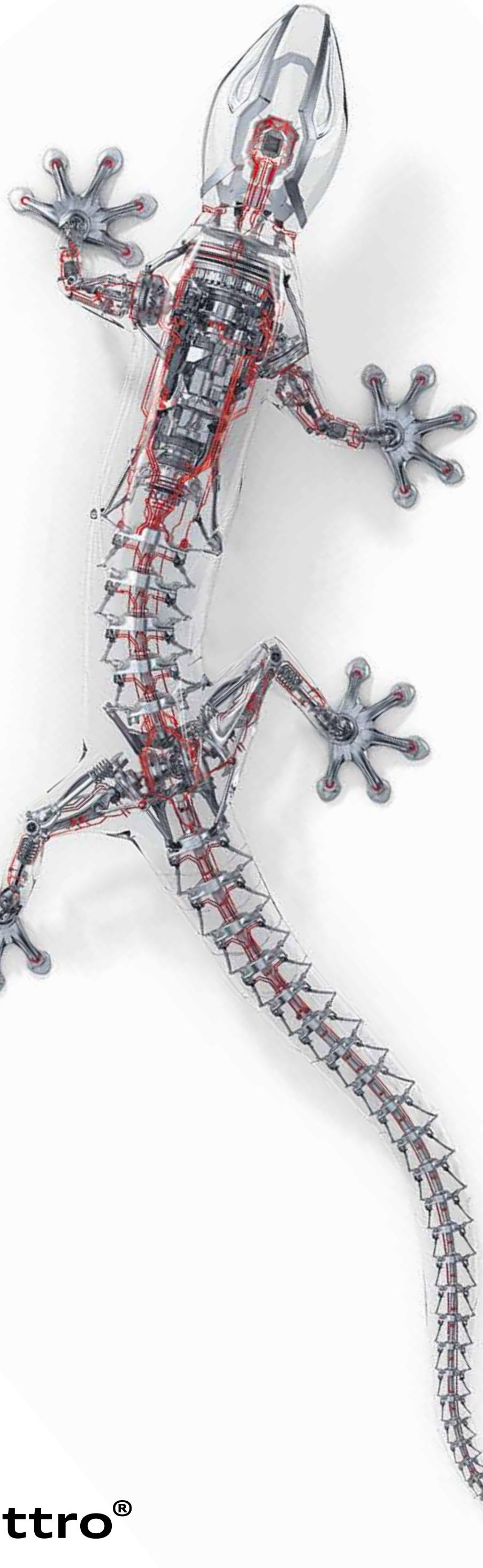

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