II
EXHIBITION
Shaping the Invisible World

Introduction to the exhibition

STRATEGIES OF NEOGEOGRAPHY IN RECENT MEDIA ART

by Boris Magrini

COUNTER-MAPPING AND MEDIA ART

The exhibition Shaping the Invisible World takes a look at contemporary artists' use of cartography as a tool by which to reveal the world's hidden realities, be they geographical, political, or social. The exhibition stems from the desire to examine how recent artists have managed to combine a poetic approach with a critical discourse regarding the practice of cartography, particularly cartography that uses digital tools. The origins of the exhibition were, first and foremost, the various practices known as counter-cartography or critical geography, studied in particular by the exhibition's co-curator Christine Schranz in her research (Schranz 2020). Geographers and researchers have revealed the subjective and partial character of every map since the second half of the 20th century, underlining that every representation of the world, or part thereof, can actually be manipulated in order to satisfy the economic or political interests of those who finance and promote such initiatives.

A science that has its origins in antiquity, cartography has been a tool of power for many years, as has been well demonstrated by Jerry Brotton, for example, in his popular book that traces the history of cartography (Brotton 2013).

Both the criticism of prevailing geographic and cartographic research and the desire for alternative, bottom-up, and collaborative approaches to visualizing local realities have given rise to a movement that is generally referred to as critical or counter-cartography. This movement uses the practice of creating alternative maps or questions traditional representations of geo-political realities. We might consider geography to not only concern the description of territories, but also that which involves the study of the set of social, political, and economic events that take place in certain territories. A critical approach to this phenomenon involves a questioning of traditional geography and of both the methodology

and the tools used to analyse socio-political and economic contexts by the establishment.

Cartographic tools themselves, as well as data visualization methodologies, have also changed profoundly in recent decades. A great change has taken place in this field with the advent of digitalization and interconnectivity. Geographic Information Systems (GIS), the Global Positioning System (GPS), and the development of high-resolution satellite imagery have all revolutionized the representation of the world and the study of geo-political realities. If these technologies have allowed for a democratization in the exchange of information and in the creation of maps and representations of the world and its realities, then they have also placed these tools in the hands of a few private companies.

It is precisely in the analysis and questioning of these tools, tools on which contemporary cartography is based, that the artists in the exhibition Shaping the Invisible World base their works, rather than critiquing cartography itself as a science. It is no coincidence that the artists who are most interested in spatial representation and data visualization today will usually have their work be accompanied by a reflection on the problem of the monopoly of digital data, the question of displaying sensitive data, the existence of little-known satellite systems, or the use of data collect ed from alternative sources. A critical and distrustful spirit towards the authorities who have a monopoly on today's cartographic tools, be they political, academic, or corporate, has now become the dominant attitude on the part of artists who can be associated with both the methodology and, above all, the ideology of counter-cartography.

QUESTIONING TRADITIONAL CARTOGRAPHY

The concepts of critical cartography and counter-mapping have revolutionized our way of thinking, reading, and creating representations of geo-political information. These movements have refused to consider map-making – and any other representation of the world and its realities —as a univocal and objective science. This does not mean that they reject its usefulness, quite the contrary, but they do claim that each map shows only a partial reality, insisting that different maps can and should be created in opposition to one-sided representations.

The main figures of this critical stance have revealed the limits of traditional geography. In a paper originally published in 1971, the famous geographer David Harvey affirmed that: "There is a clear disparity between the sophisticated theoretical and methodological framework which we are using and our ability to say anything really meaningful about events as they unfold around us" (Harvey 2016: 17-18). Harvey asserted the need for a revolution in the science of geography on the basis of this exact discrepancy, between the academic tools of analysis of the world and the need to intervene in the world. Following that particular train of thought, geographer and cartographer John Brian Harley not only stressed the always-subjective nature of any geographical survey, but also how it is often driven by opportunistic interests and as a means for the ruling authorities to justify their actions. According to Harley, cartography is an elaborate fiction, one developed and maintained by those in power in order to control and subjugate minorities: "Maps are preeminently a language of power, not of protest" (Harley 2002: 79).

The criticism advanced by those involved in counter-mapping approaches has made it possible to question the institutions that produce mapping tools and the prejudices that are involved in both the creation and distribution of information. Moreover, it has allowed the development of new, more democratic strategies for the representations of the world. These new ways of making cartography, understood here in full, involve the potential visualization of processes that are either rarely explored or the visualization of processes that are known, but which need to be expressed with alternative points of view.

DIGITAL TOOLS AND NEOGEOGRAPHY

Without any doubt, digital tools have paved the way for the development of cartographic research outside the traditional fields dominated by the state, academia, and private companies. This has resulted in a multiplication of individual initiatives that are often labeled as 'experimental geography', as exemplified by the many projects collected in a book edited by Nato Thompson, Jeffrey Kastner, and Trevor Paglen (Nato/Kastner/Paglen 2008), or in the equally compelling work published by Janet Abrams and Peter Hall (Abrams/Hall 2008). This phenomenon can be partly linked to practices developed by artists who make creative use of tools such as GIS, GPS, and satellite imagery.

The concept of experimental geography, or neogeography, has often been used to describe Trevor Paglen's approach, who has developed his artistic work on the basis of the use of methodologies and tools that are close to geography, but which are used for alternative purposes. For instance, his well-known Limit Telephotography series, which shows otherwise inaccessible buildings through the use of extremely powerful telephoto lenses. Paglen combines strategies of observation of the territory – or in this case through methodologies that are akin to astronomical observation – with a critical discourse of institutions of power, such as military or surveillance buildings. His project, The Other Night Sky, conversely, uses data collected by an international public of amateur satellite observers to calculate the orbits of satellites and to photograph them.

Reflections on the putting into orbit of satellites to reveal territorial data, a phenomenon that has revolutionized the practice of cartography, is also found to occupy the center of the work of artists such as Quadrature and fabric | ch. Both of the aforementioned artists create works that make visible the existence of satellites, their trajectory, and their activities. With their works, the artists make us aware of the massive presence of these instruments in orbit, whether they are satellites used for the operation of GPS, for the observation of atmospheric and ecological phenomena, or if they are satellites that are used for military purposes. Quadrature's Supraspectives and Satellite Daylight by fabric | ch raise questions about the problem of surveillance, but moreover about the hegemony and the use of data that these systems generate.

James Bridle is equally well known for his research into digital tools related to land observation or to navigation, such as GPS, geolocation software, drones, and surveillance cameras. His critical view of technology, and the need to develop a greater level of technological literacy among the population, was emphasized in his famous publication New Dark Age (Bridle 2018). His interactive Rorschmap and Roschmap Street View allow kaleidoscopic compositions to be created from online digital Google maps. The artist exploited this approach again in his work Catch and Release, which raised the issue of generating big data in the study of biological and ecological phenomena, among flamingos in his specific case. The artist had access to the Tour du

Valet's huge database, which includes sightings of over 600,000 individual birds. The artist emphasizes the intricate problem of collecting, visualizing, and making sense of data in the study of complex phenomena by combining satellite images with sentences from the database.

ALTERNATIVE MAPS AND VIRTUAL WORLDS

While the digital tools used for data collection and visualization have had an important impact on the practice of cartography, an equally fundamental paradigm shift has taken place with regards to the consideration of the objectivity of each data visualization. Laura Kurgan, who is both an artist and an exemplary data visualization researcher, stresses the subjective character of each map, stating that, “The spaces that maps try to describe can be ideal, psychological, virtual, immaterial, or imaginary - and they are never just physical” (Kurgan 2013: 16). She concludes that, “we need to learn how to agree and disagree with those arguments, to challenge the interpretations made of images that are anything but objective or self-evident” (Kurgan 2013: 26). Laura Kurgan’s work is a renowned illustration of the integration of counter-cartography into an artistic context and she has had a significant impact on many artists who currently adopt similar strategies. Kurgan’s maps are an example of how a critical and creative use of data analysis and visualization tools allows for a different reading of social and political realities.

Similarly, the artists’ group bureau d'études (Léonore Bonaccini and Xavier Fourt) has created a multitude of alternative maps in order to make visible the political and, above all, the economic realities linked to capitalist and colonial market logics (Holmes/Lomme/bureau d'études 2015). Both Kurgan and bureau d'études have shown how the exercise of visualizing data, which is already known but which is organized differently from the dominant discourses,

enables a different understanding of the realities that are being analyzed and illustrated.

Artists such as Kurgan, bureau d'études, and many others among whom we might mention Forensic Architecture, have succeeded in developing cross-cutting projects that are exemplary for several reasons: they use a transdisciplinary approach to create visualizations and analyses of phenomena that would remain largely overlooked or which would be analyzed in an unfair and discriminating way by the regimes in force in the places studied; they use a typical counter-mapping approach because they exploit data collected not just by the authorities, but also by the population; finally, they all synthesize scientific rigor and artistic language in order to reach a wider audience. Put otherwise, their analyses become objects of aesthetic-artistic contemplation and, thus, assume an emblematic and moral level that goes beyond the specificity of the events discussed. These strategies underline how the adoption of neogeography or counter-cartography research in an artistic context can be not only satisfying from an artistic point of view, but also from an informative, epistemological, or even a political one. Many theorists have questioned traditional geography and stressed the importance of alternative forces in the construction of the representation of the world. Artists, in turn, appropriate counter-cartography strategies, even though they often do not work in a strictly scientific or academic field, and can certainly contribute to the different construction of a representation of the world. In this sense they operate as neogeographers.

An example of a freer, but equally compelling approach, is that of the artists Esther Polak and Ivar Van Bekkum who appropriated Judith Butler’s concept of performativity of genres and Speech Acts from the philosophy of language and applied these concepts to their investigations of the territory and urban spaces. Their approach has been exemplified through their workshops City as Performative Object, but also in the ‘Walking Essay’ by Esther Polak

through Google Earth (Polak/Van Bekkum 2017). They have produced several videos using Google Earth and Google Street View, often combining their recordings with tools such as GPS and binaural microphones. Google Maps is now among the most widely used but also discussed and criticized GIS and web mapping tool. In their work, which makes a creative use of Google Maps and Google Earth, Esther Polak and Ivar Van Bekkum skilfully mix geolocation tools, GIS, and web mapping to develop a reflection on the inhabitation of public space, the question of privacy, but also the discrepancy between the lived reality of a place and its digital representation. If Google Maps is still criticized for its monopoly on web mapping, and for the fact that the process of mapping and data collection is not fully transparent or publicly accessible, this means that the majority of today's population use a tool whose accuracy or correctness in the data creation process cannot be verified. Google Maps presents further problems related to the fact that it is proprietary software – contrary to open-source projects such as Open Street Maps – and to the fact that it tracks the user's history. The works by Esther Polak and Ivar Van Bekkum that do make use of Google's various web mapping and GIS raise the question of the supremacy and integrity of these tools and services.

There are also digital maps beyond these functional tools. Some video games are an example of software offering digital reconstructions of entire cities. Can we consider such software, even though it was created for entertainment purposes, as digital maps? Is the question of whether they are accurate or not a relevant one in such a recreational context? The artists Total Refusal (Robin Klengel & Leonhard Müllner) have created a performance within the virtual world of The Division (Ubisoft, 2016). The online video game presents a realistic and detailed digital reconstruction of Manhattan, evidently adapted to the post-apocalyptic scenario of the video game. The artists coordinated a tourist walk named Operation Jane Walk – inspired by the worldwide series of Jane's Walk city tours – in order to discuss the urban planning and building choices of the virtual universe. After all, if millions of people play these games every day, immersing themselves in digital reconstructions of existing cities, their experience of the virtual spaces partly replaces the real experience. The question of who is responsible for how this experience is represented may be as important as the question of how Google Maps retrieves and calculates the data on which it bases its web mapping.

The Artist Fei Jun has gone one step further, creating an interactive game in which the public can even build fictional worlds from ordinary objects rendered in 3D. In his installation Interesting World, users can not only create their own worlds, but also visit and modify other users' creations. With this work, the artist underlines the idea that the representation of a world is always an exercise in negotiation between various points of view.

These examples show that critical geography is a territory that lends itself to exploration, not just by scientific researchers and geographers, but also by artists and people from different horizons. If it is true that cartography is not simply an act of reproducing the world, but also an act of modeling perceived realities, then artists must contribute to the construction of such a world. Artists manage to propose representations of the world that are nevertheless essential for an equally critical discourse on existing realities through a freer and more creative approach.

ECOLOGICAL ACTIVISM, FICTIONAL SCENARIOS, AND ARTIFICIAL INTELLIGENCE

The term counter-mapping is often associated with revolutionary, bottom-up projects, produced by NGOs opposing the maps produced by authorities who often pander to the economic interests of multinationals. Counter-mapping projects often have an ecological reason and purpose. It is no coincidence that the struggles for the recognition of environmental catastrophes go hand in hand with the work of visualizing such disasters. If those responsible for the damage caused to the land or to the environment, whether government authorities or private companies, have an interest in concealing or minimizing the data about such damage, then it is often the minorities who have to fight to have the facts recognized. Counter-cartography and ecological activism, therefore, naturally stand together.

In this respect, the work of Persijn Broersen & Margit Lukács is particularly interesting. Their video Forest on Location and video sculpture Shvayg Mayn Harts are both a documentation and a memorial of the Białowieza forest in Poland, a national park. The site has also been a UNESCO World Heritage Site since 1979. Although the forest is a protected heritage site, the Polish government approved the logging of trees, justified by the presence of a parasite. The Białowieza forest, which the artists recorded by means of photogrammetry and reproduced by means of a video, a 3D reproduction of a trunk, and then combined with a popular song performed by the Iranian singer Shahram Yazdani, becomes the territory in which issues are confronted. These issues include the opposition of cultural and economic interests, the need to preserve a territory and its biotope, and profit-making through deforestation operations.

Both the visualization of macroscopic environmental problems and the visualization of microscopic phenomena, such as the problem of air pollution, can be part of a mapping project of the territory, as the work of Studio Above&Below (Daria Jelonek and Perry-James Sugden) demonstrates. The artists make use of augmented reality to render visible the imperceptible changes in air quality in different environments. The use of AR technology seems particularly effective in conveying information with an intuitive real-time visualization process in their installation Digital Atmosphere.

Virtual reality, rather than augmented reality, is the technology used by Jakob Kudsk Steensen to address issues of land representation and environmental challenges in his installation Primal Tourism. Using digital tools, but also multiple cartographic sources and historical documents, the artist has faithfully reconstructed the island of Borabora, but introduces a science fiction scenario, namely the vision of a future in which global warming has partially submerged the island, making it uninhabitable. The possibility offered for the user to explore the island in a virtual universe, but also to learn about its history through interactive documents scattered in the corners of the island, is in the end another example of possible counter-mapping, realized here with cutting-edge technology. The science-fiction scenario clearly compromises the reading of this impressive digital map as a reliable tool, but at the same time extends the concept of data interpretation, which also occurs in the most rigorous cartography, as mentioned previously. The artist emphasizes the subjective character of digital tools in specific in order to investigate the

effects of digitalization on our perception of nature and on our understanding of geopolitical constructs

An only seemingly more objective speculation of future scenarios is proposed by Tega Brain, Julian Oliver, and Bengt Sjölén in their work Asunder. They programmed a supercomputer with a machine learning-based software for the prediction and resolution of future climate catastrophes. Once again, the visualization of future data combined with the production of fictional maps is an exercise that extends far beyond the usual counter-mapping practices. The work is, in fact, an ironic commentary on technological solutions to environmental problems.

The examples proposed in the exhibition Shaping the Invisible World illustrate this freer and yet no less important approach. Artists demonstrate that a map is never an exact replica of the reality being represented by assuming the freedom to exploit digital tools for the representation of the world, or a part thereof, or even to create fictitious representations. Nevertheless, this representation is an equally necessary vehicle for the discussion of facts.

SHAPING THE INVISIBLE WORLD

The exhibition Shaping the Invisible World brings together a selection of artists who exemplify the recent assimilation of ideas and strategies from counter-cartography to neogeography. The artists' work can be defined as an attempt to develop a fragmentary, but still free and liberating, view of the world. These artists create different narratives and question the representations defined by conventional, authoritarian, governmental, or dominant private companies. What also distinguishes them is the use of different technologies and different tools of representation, including augmented reality, virtual reality, artificial intelligence, and interactive video games. However, as Laura Kurgan has pointed out, "there is no such thing as raw data" (Kurgan 2013, 35), there is no such thing as an objective representation of the world because the collection of any

kind of data is already an interpretation. Hence, the work of artists who collect, create, and arrange new data to form a partial illustration of the world can be regarded as a valid contribution to the representation of the territory and of its multiple realities.

As a closing remark, we can conclude that the feeling of distrust towards the dominant authorities responsible for the existing tools of representation and geo-political analysis is often shared by artists working in the field of neogeography. Yet, what the artists add to counter-cartography is an alleged freedom in the use of representation tools, not simply in just representing different topics, thereby highlighting hidden realities and visualizing information in a different way. The examples discussed show that artists, thanks to the poetic freedom they have at their disposal, can develop strategies that go beyond the existing possibilities of counter-mapping. The use of performative approaches, the creation of fictitious and virtual universes, or the exploitation of technologies related to digital geography are also examples of practices for a possibly less rigorous, but nevertheless relevant, discussion of geographical issues. The map is a representation of the world; in a broader sense, it is a representation of what is happening in the world, of the population, and its multiple realities. The map is both an instrument of representation and knowledge. It is also the result of an observation, but also a projection and a vision for the future. Through their visionary works, artists who use new media and technologies that

are close to the tools used in counter-cartography contribute to questioning perceptions of reality that are often the result of manipulation for political or economic purposes. Their contribution is now more necessary than ever, particularly at a time when information control has become a flagrant and perfidious political tool.

BIBLIOGRAPHY

ABRAMS, JANET/PETER HALL (2008): *Else/Where: Mapping New Cartographies of Networks and Territories,* Minneapolis MN: University of Minnesota Design Institute.

BRIDLE, JAMES (2018): *New Dark Age: Technology, Knowledge and the End of the Future,* London: Verso.

BROTTON, JERRY (2013): *A History of the World in Twelve Maps,* London: Penguin Books.

HARVEY, DAVID (2016): *The Ways of the World,* London: Profile Books.

HARLEY, J. B./PAUL LAXTON (2002): *The New Nature of Maps: Essays in the History of Cartography,* Baltimore, Mar: Johns Hopkins University Press.

HOLMES, BRIAN/ FREEK LOMME/BUREAU D'ÉTUDES (2015): *An Atlas of Agendas: Mapping the Power, Mapping the Commons,* Eindhoven: Onomatope.

KURGAN, LAURA (2013): *Close Up at a Distance: Mapping, Technology, and Politics,* New York: Zone Books.

POLAKVANBEKKUM (2017): "The City as Performative Object. An Essay in Footsteps." Last modified, June 27, 2017. https://online-open.org/the-city-as-performative-object

SCHRANZ, CHRISTINE (2020): *Augmented Spaces and Maps. Das Design von kartenbasierten Interfaces,* Basel: Birkhäuser Verlag.

THOMPSON, NATO, JEFFREY KASTNER, AND TREVOR PAGLEN (2008): *Experimental Geography,* Brooklyn, N.Y.: Melville House.

EXHIBITION VIEWS

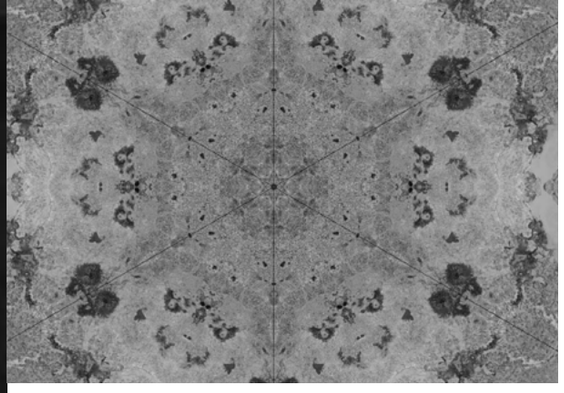
WORKS/ARTISTS IN THE EXHIBITION

● BUREAU D'ÉTUDES

Closer to traditional cartography and counter-mapping are the activities of the French artist duo Léonore Bonaccini and Xavier Fourt, who work under the name bureau d'études. Since the 2000s, they have been producing maps of geopolitical, economic and social situations, which reveal indiscernible dynamics of the capitalist system and colonial logic. Their maps, characterized by a creative use of infographics, are often produced in large formats, and are presented in museums and other exhibition spaces. Astropolitique (2019), their latest map, deals with asteroid mining and shows ongoing research into this a yet theoretical economic model, which is of increasing interest due to the pending terrestrial exhaustion of minerals needed for the production of computers, laptops and tablets. Their map also looks at social and environmental disasters that have already been caused by the extraction of these rare resources on Earth.

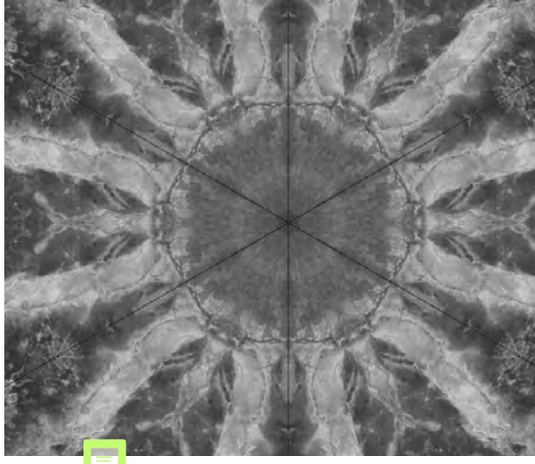
BIO The Paris-based artists Léonore Bonaccini and Xavier Fourt form the artist-duo bureau d'études. On the initiative of Ewen Chardronnet and the duo, the newspaper "La Planète Laboratoire" was created in 2007. For the last several years, the French Group has been producing cartographies of contemporary political, social, and economic systems. The visual analysis of transnational capitalism is based upon extensive research and is usually presented in the form of large-sized murals. 'Governing by Networks', a chart produced in 2003, visualizes the mutual involvements and dependencies within global media conglomerates. These visualizations of interests and corporations re-symbolize the unseen and hidden, thereby revealing what normally remains invisible and contextualising apparently separate elements within a bigger whole.

▲ Bureau d'études / Collectif Planète Laboratoire, Astropolitique, déplétion des ressources terrestres et devenir cosmique du capitalisme: une cartographie [2019], print on paper.
Photo courtesy of the artists.



● JAMES BRIDLE

James Bridle uses GPS, geolocation software, weather data collection, public mapping, drones, and surveillance cameras to create his works, which he accompanies with a critical perspective on technology. The work Catch and Release (2018) explores the history of radar technology and its current developments, intersecting the history of surveillance with that of bird migration observation. For this work the artist was able to access the vast database of the Tour du Valat (a private foundation working for the conservation of Mediterranean wetlands in France), which contains over 600,000 flamingo sightings. Bridle investigates the tricky challenge of collecting, visualizing and evaluating data in the study of complex phenomena by dramatizing these datasets with aesthetically compelling satellite images. The two-channel installation is connected online to a database on the artist's personal server. One channel shows entries from the bird observation database while the other visualizes the geographical location mentioned in the entry with a kaleidoscopic composition. As a new line of data appears, the last is erased from the work's database.



BIO James Bridle is a writer and artist working across both technologies and disciplines. ~~Their~~ artworks have been commissioned by galleries and institutions and exhibited both worldwide and on the Internet. ~~Their~~ writing on literature, culture, and networks has appeared in magazines and newspapers including Wired, the Atlantic, the New Statesman, the Guardian, and the Observer. "New Dark Age", ~~their~~ book about technology, knowledge, and the end of the future, was published by Verso (UK & US) in 2018, and ~~they~~ wrote and presented "New Ways of Seeing" for BBC Radio 4 in 2019. ~~Their~~ work received an Honorary Mention at the Prix Ars Electronica 2013, an Excellence Award at the Japan Media Arts Festival 2014, and an Honorary Mention at CERN COLLIDE 2016. It was also shortlisted for the Future Generation Art Prize 2014. Bridle won the Design Museum Graphics Design of the Year in 2014.

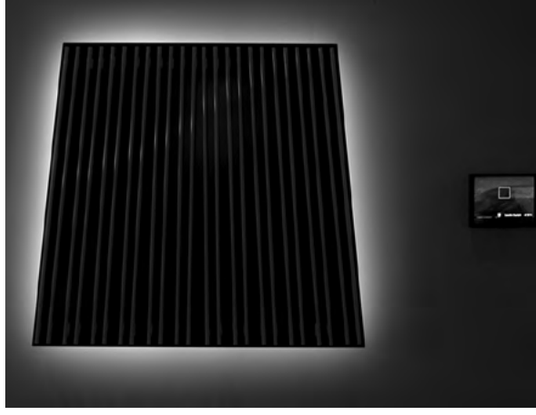
▲ James Bridle, Catch and Release [2018], two-channel digital installation.
Photo courtesy of the artist.

● TREVOR PAGLEN

Trained as an artist and geographer, Trevor Paglen exemplifies the fusion of counter-cartography and art. His photographic series, Limit Telephotography, portrays the location of military bases and industrial complexes that are usually inaccessible due to land and air space restrictions, using techniques and lenses close to those used for astrophotography. Paglen has devoted most of his work to the analysis of the functioning and logic of state surveillance and has collaborated with several other artists and researchers throughout their projects. The video Circles (2015) presented here surveys the surveillance system itself, showing an aerial view of the GCHQ (Government Communications Headquarters) filmed with a drone. The GCHQ, located near Gloucester, is an intelligence and security organization, which provides information to the UK government and armed forces. It has been at the center of controversies related to the abuse of surveillance and security protocols and the disregard of private data.

BIO Trevor Paglen is an artist whose work spans image-making, sculpture, investigative journalism, writing, engineering, and numerous other disciplines. Paglen's work has had one-person exhibitions at Nam June Paik Art Center, Seoul; Museo Tamayo, Mexico City; the Nevada Museum of Art, Reno; Vienna Secession, Eli & Edythe Broad Art Museum, Van Abbe Museum, Frankfurter Kunstverein, and Protocinema Istanbul, and has participated in group exhibitions at the Metropolitan Museum of Art, the San Francisco Museum of Modern Art, the Tate Modern, and numerous other venues. He is the author of five books and numerous articles on subjects including experimental geography, state secrecy, military symbology, photography, and visuality. Paglen's work has been profiled in the New York Times, Vice Magazine, the New Yorker, and Art Forum. In 2014, he received the Electronic Frontier Foundation's Pioneer Award for his work as a "groundbreaking investigative artist."

▲ Trevor Paglen, Circles [2015], video. Photo courtesy of the artist, Metro Pictures, New York, Altman Siegel, San Francisco.

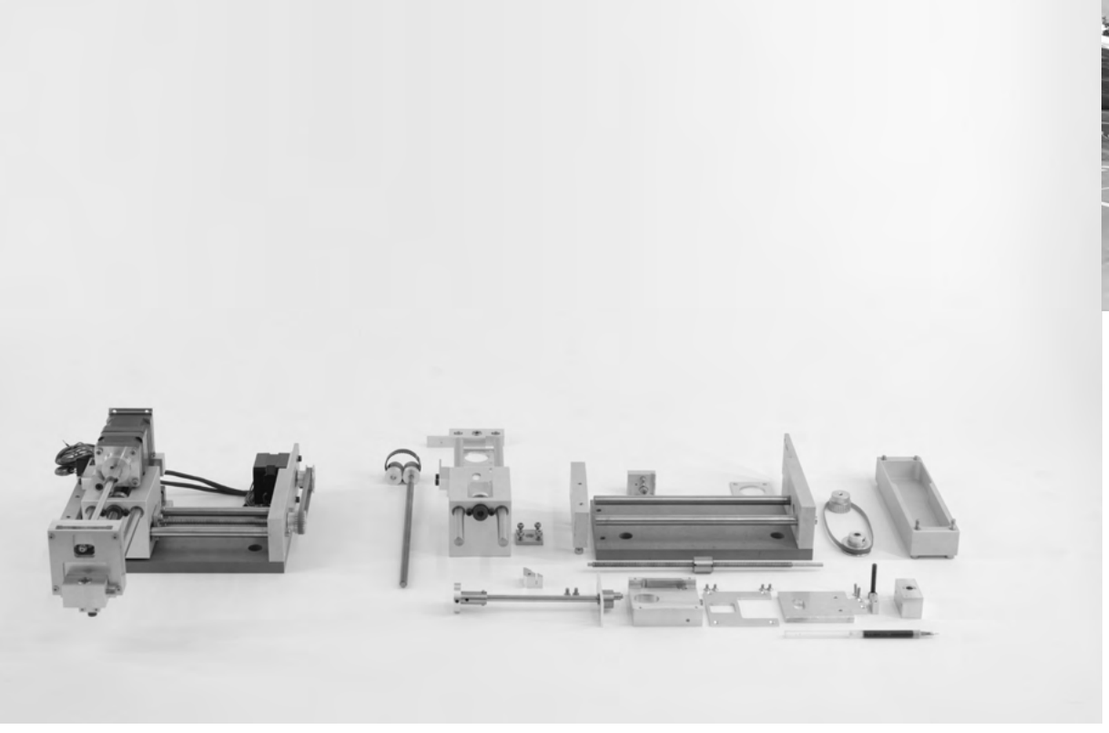


● FABRIC | CH

The studio for architecture, interaction, and research fabric | ch takes a look at the increasingly important presence of satellites. The installation, Satellite Daylight, 47°33'N (2020), simulates light as perceived by a meteorological satellite orbiting the earth and the latitude of Basel at a speed of 7,541m/s. The installation consists of 24 neon tubes that reproduce the meteorological reality perceived by the satellite during its trajectory, depending on whether it is in a sunny, cloudy position, day, or night, all in real time. A screen shows a real-time weather map with the imaginary satellite. Satellite Daylight, 47°33'N draws attention to the existence of weather satellites and their influence on our understanding of the world and living conditions.

BIO fabric | ch formulates new architectural proposals and produces singular liveable spaces that bind localized and distributed landscapes, algorithmic behaviours, atmospheres and technologies by combining experimentation, exhibition, and production. Since the studio's foundation, fabric | ch's architects and scientists have investigated the field of contemporary spaces, from network-related environments which mingle physical and digital properties to the interfacing of dimensions, such as their recent research about "spatial interferences" and "moirés spaces". The work of fabric | ch deals with issues related to the mediation of our relationship to place and distance, to automated climatic, informational, and energy exchanges, mobility, and globalization, all embedded in a perspective of creolization, spatial interbreeding, and sustainability. fabric | ch is composed of Christian Babski, Stéphane Carion, Christophe Guignard, and Patrick Keller.

▲ fabric | ch, Satellite Daylight 66°24'S [2017], interactive installation, neon lights, flat screen, Internet. Photo: Daniela & Tonatiuh
fabric | ch, Satellite Daylight, 47°33'N [2020], interactive installation, neon lights, flat screen, Internet. Photo courtesy of the artists.



QUADRATURE

Satellites are also the object of analysis of the Quadrature artists. Their recent work, Supraspectives (2020), is a result of the collection of information from 590 spy satellites that remain in orbit, though not all of them are currently in operation. The work calculates the satellites' trajectories and reconstructs what they observe of the world, particularly those satellites that pass near the installation's exhibition site. Information related to the satellites, origin, country, function, are made visible every time that the images related to their trajectories are shown on the screen. Although the images are artistic reconstructions, the work shows a reality that is often invisible or ignored, that of the military use of satellites constantly observing the surface of the earth. Indeed, one might wonder how many spy satellite projects are currently in operation, given that the majority of the population being aware of them. The Satelliten (2015) installation similarly displays the number of satellites that are in orbit. A plotter draws the trajectory of a satellite in a given location on old maps in a space of 10cm2 and in real time. The situation is repeated for each satellite orbiting the same area until the map space is completely covered by a black square.

BIO Quadrature's artistic research focuses on data and physical experiments. The Berlin-based artist duo understand technology as a means to read and write realities. Together they pursue a transdisciplinary approach, using various media, such as time-based performance and installation, as well as classical sculptural and two-dimensional works. For a period of some years, the artists have been working on the methods and stories involved in exploring our world and the cosmos around us. The group's members, Juliane Götz, Sebastian Neitsch and formerly Jan Bernstein (until 2016), have won several awards and scholarships for their artistic practice, including recognition by the Prix Ars Electronica in both 2015 and 2018, scholarships from the Kunstfonds Bonn, Akademie Schloss Solitude, and LaBecque, as well as a fellowship from PODIUM Esslingen and the Hertz-lab of the ZKM Karlsruhe (Centre of Art and Media). Their works are shown around the world in various festivals and exhibitions.

▲ Quadrature [Bernstein, Götz and Neitsch], Satelliten [2015]Mixed media.
Photo courtesy of the artists.

ESTHER POLAK & IVAR VAN BEKKUM

Counter-cartography can have a performative character, instead of being limited to the creation of representations. Artists Esther Polak and Ivar Van Bekkum have created walks and performances in the city, applying the concept of performativity – developed by Judith Butler in her discussion of gender – to urban environment and activities. Their thesis is that a city is only a representation of itself as long as it is not walked through and experienced by people who actuate it through 'move-acts', a transposition of the concept of 'speech-acts'. Esther Polak and Ivar Van Bekkum have also used Google maps and GPS to create their works, be they videos or performances. During a residency in Philadelphia, they developed a software that allowed them to make videos in Google Street View and Google Earth using geolocation and by synchronizing the GPS data with the audio recordings. In their work The Mailman's Bag (2015), the artists collaborated with a mailman and equipped his bag with a sound-recording tool and a GPS. The resulting film creates a view of the postman's path, by making a portrait of a neighborhood in Philadelphia through distorted Google Earth images. The most recent video, The Fortune (2018), uses Google Earth to portray a habitual location for popular protests in The Hague. However, in this film there are no people, just a merry-go-round, which is installed there for a funfair once a year. It typifies a coincidence that occurs when using Google Street View, which depicts the place at a certain time, no matter whether the view actually reflects what usually happens there or not.

BIO Esther Polak and Ivar van Bekkum work together under the name PolakVan Bekkum. Since 2002, their work has focussed on landscape and mobility. Rooted in the history of the Dutch realistic landscape depiction, they engage with new technologies like GPS and data collection to express individual experiences of spaces, like the contemporary city and countryside. They always search to change ways to be in landscapes and how this influences the human understanding and perception of space and the stories we tell to explain our lives. They have worked and exhibited internationally: at Transmediale Berlin, Ars Electronica Linz, ZKM Karlsruhe, IMAL Brussels, Rento Btattinga | Gallery Amsterdam, and Museo for Image and Sound, Sao Paolo. In 2005, Esther Polak received a Golden Nica for interactive Art at Ars Electronica together with Ieva Auzina, for their MILKproject.

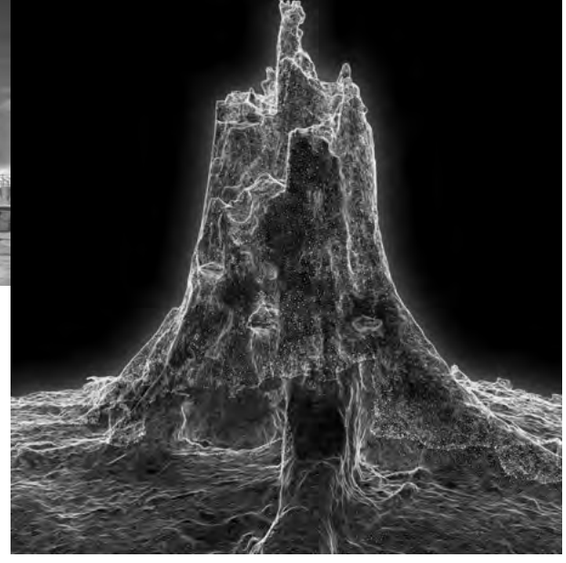
▲ Esther Polak & Ivar Van Bekkum, The Mailman's Bag [2015], video, rendering in Google Street View.
Esther Polak & Ivar Van Bekkum, The Fortune [2018], video, rendering in Google Earth.
Photo courtesy of the artists.

● TOTAL REFUSAL (LEONHARD MÜLLNER & ROBIN KLENGEL)

A performative approach characterizes the work of Total Refusal (Leonhard Müllner & Robin Klengel), particularly in their work Operation Jane Walk (2018). Instead of making guided tours in the real neighborhoods of a city, the artists instead visited virtual spaces in the online video game Tom Clancy's The Division (Ubisoft, 2016), which offers an extremely realistic, albeit dystopian, reconstruction of Manhattan. While the logic of the video game requires players to engage in armed combat within different factions occupying New York City in the future, the artists tried as much as possible to escape any conflict in order to take a walk through the virtual reconstructions of real existing buildings, discussing issues of architecture, history, urbanism, as well as the reasons that led the game's producers to make choices related to the reconstruction of the city. Reflecting on the representation of a city in a virtual universe, which is experienced daily by hundreds of thousands of players on the net, it shows how this kind of cartographic work has an impact on the perception of a city, its history, and identity.

BIO The artist/filmmakers collective and pseudo-Marxist media guerrilla Total Refusal (Leonhard Müllner, Michael Stumpf, and Robin Klengel) intervenes in current video games and writes papers about games and politics. Since 2018, it has been awarded 17 prizes (and 10 honorary mentions) like the Loop Discovery Award, the Contemporary Visual Arts Award of Styria Province, and Vimeo Staff Pick Award, among others. Total Refusal has been screened at more than 120 film and video festivals like Berlinale (2020), BFI London (2018), and IDFA Amsterdam (2018) and they have been exhibited at various exhibition spaces like CURRENTS New Media in Santa Fe (2020) and the Ars Electronica Linz (2019).

▲ Total Refusal [Robin Klengel & Leonhard Müllner], Operation Jane Walk [2018], live online performance, video. Photo courtesy of the artists.



● PERSIJN BROERSEN & MARGIT LUKÁCS

Wild landscapes and their representations are often the object of analysis by the artists Persijn Broersen and Margit Lukács. Their work, Forest on Location (2018), consists of scanning through photogrammetry and the digital reproduction of a part of the Białowieza Forest in Poland, a national park, and UNESCO World Heritage Site since 1979. Despite this, the industrial use of wood has recently taken place with the consent of the Polish government, justified by the propagation of bark beetles that undermine the preservation of the trees. The justification has been questioned by ecological organizations, who consider the operation to be solely motivated by economic ends. The scanning of part of the forest by the artists is presented through a video that is accompanied by a song performed by Iranian singer Shahram Yazdani, a cover of the popular song Nature Boy by Nat King Cole, in turn inspired by a song by Yiddish composer Herman Yablokoff. The artists have also made a 3D print of a forest tree trunk, the work Shvayg Mayn Harts (2018), which is used as a projection surface and is a pendant to the video Forest on Location. Applications of their own geographical research tools, such as photogrammetry, are used by the artists to create a poetic work that is also an homage to a real landscape that is also the terrain for political, cultural, and ecological debates.

BIO Persijn Broersen and Margit Lukács are artists who live and work in Amsterdam. They use a wide variety of media – most notably video, animation, and graphics – producing a myriad of works that reflect on the ornamental characteristics of today's society. The work of Broersen and Lukács is characterized by a quest for the sources of contemporary visual culture. They demonstrate how reality, (mass) media, and fiction are strongly intertwined in contemporary society through video pieces that incorporate (filmed) footage, digital animation, and images appropriated from the media. Their films, installations, and graphic work have been shown internationally, at among others Biennale of Sydney (AU), Stedelijk Museum Amsterdam (NL), Rencontres Arles (FR), Art Wuzhen (CN), MUHKA (BE), Centre Pompidou (FR), and Casa Enscendida (ES). The film 'Establishing Eden' was nominated for the IFFR Tiger Awards 2016.

▲ Persijn Broersen & Margit Lukács, Forest on Location [2018], video. Photo courtesy of the artists and AKINCI. Persijn Broersen & Margit Lukács, Shvayg Mayn Harts [2018], 3D sculpture, video, 215x220x165cm. Photo courtesy of the artists and AKINCI.

● STUDIO ABOVE&BELOW

The studio Above&Below created Digital Atmosphere, an installation using augmented reality to visualize local air pollution data. The work, inspired by early air pollution devices, uses live data inputs to generate an evolving virtual experience. By using virtual reality to visualize air pollution, Above&Below have created a tool that allows for a sensory perception of an otherwise invisible phenomenon. Air pollution is displayed as a flocking system, and although the attempt to map and visualize pollutants in such a way is meant as a poetic experience, the artists invite us to think about ways to understand and discuss pollution in the future. Their work also comes close to research, as they often collaborate with researchers and scientists in the development of their projects. Digital Atmosphere, for example, resulted from conversations with scientists from King's College in London, and the Atmo Sensor was developed in close collaboration with the Swiss INT Studio.

BIO Studio Above&Below is a London- and Ruhrarea-based art and design practice founded by Daria Jelonek and Perry-James Sugden. Their work combines computational design, speculative storytelling, and digital art in order to draw together unseen connections between humans, machines, and the environment – working towards better future interactions with our environment. Believing in research-based art, Studio Above&Below works with scientists, technologists, and communities to push the boundaries of digital media for future living. The duo's work has been exhibited internationally at institutions such as the Royal Academy, Tate Modern, V&A London, Photophore during the Venice Biennale, Today Art Museum, WRO Biennale, SONAR, WIRED Japan, Hyundai Motorstudio, and the International Shortfilm Festival Oberhausen. Previous prizes and funding awarded include the Near Now Fellowship, Collusion Art Funding, Lumen Prize (shortlisted), Bloomberg Bursary, WIRED Creative HackAward (finalist), Communication Arts Award – Interactive Art and the Battersea Sculpture Prize.

▲ Studio Above&Below, Digital Atmosphere [2020], mixed reality sculpture. Photo courtesy of the artists.

● TEGA BRAIN, JULIAN OLIVER, AND BENGT SJÖLÉN

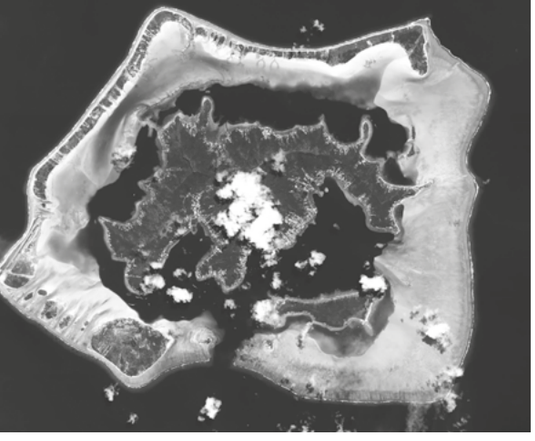
While ecology is an important and urgent field of research in geographical studies, the use of artificial intelligence not only to analyze climatic and ecological realities, but even to create models for solving environmental problems is a field that is likely to develop further in the future. The artists, Tega Brain, Julian Oliver, and Bengt Sjölén have created a simulation program, based on a supercomputer and machine learning technology, for the creation of plant scenarios in which the possible future climatic conditions are predicted as well as the necessary security measures for the solution of climate crises. The results proposed by the supercomputer in their work, Asunder (2019), are often absurd and improbable. The aim of the artists is, therefore, to question the increasingly widespread use of AI technologies for the solution of ecological problems. Technosolutionism in general, as well as the idea that computational approach is neutral, are both questioned in the artists' work.

BIO Tega Brain is an Australian-born artist and environmental engineer whose work examines how technology shapes ecological relations. She has created wireless networks that respond to natural phenomena, systems for obfuscating fitness data, and an online smell-based dating service. Her work has been shown in the Vienna Biennale for Change, the Guangzhou Triennial, and in venues like the Haus der Kulturen der Welt in Berlin, and the New Museum, NYC, among others.

Julian Oliver is a Critical Engineer, artist, and activist based in Berlin. Exhibiting since 1996, his projects and lectures have been presented at many museums, international electronic-art events, and conferences, including the Tate Modern, Transmediale, Ars Electronica, The Chaos Computer Congress, FILE, and the Japan Media Arts Festival. Work made by Julian, or in collaboration with others, has received several awards. Julian has often dedicated his studies and knowledge in counter-surveillance, network engineering, information security, and systems administration to the assistance of at-risk groups, with a focus on environmental defense.

Bengt Sjölén is an independent software and hardware designer/hacker/artist based in Stockholm and Berlin with roots in the Atari demo scene. He collaborates within several networks like Weise7, Hackteria and Critical Engineering Working Group. His work follows many different threads spanning subjects such as biology, software radio, electromagnetic fields, and artificial intelligence. His work has been presented internationally in events like Arte Mov, Ars Electronica, Synthetic Times Exhibition, NTT ICC Tokyo, Venice Biennale of Architecture, ISEA, Pixelache, World Expo 2010, Transmediale, and The Glass Room.

▲ Tega Brain, Julian Oliver, and Bengt Sjölén, Asunder [2019], three channel video-projection, satellite imagery, CESM climate model, multi-processor computer, and custom software.
Asunder was commissioned by the MAK for the VIENNA BIENNALE 2019.
Photo courtesy of the artists.



● JAKOB KUDSK STEENSEN

The work Primal Tourism (2016) by Jakob Kudsk Steensen is an exact, full-scale virtual replica of the iconic tourist island of Borabora in French Polynesia. The artist recreated the island in a 3D environment for a virtual reality experience built with the Unreal Engine, using various sources such as cardboard, plans, satellite images, tourist photographs, images from scientific magazines, drawings, and historical reports. The narratives he creates around the island tells stories of tourism, colonialism, and technology. Steensen did not simply use cartographic tools to create a realistic immersion, as often happens in video games that reconstruct existing landscapes, but he also created an immersive environment in which the viewer can discover elements of history, both real and virtual, to create an understanding of the events related to the island that speak of more global ecological problems. The fact that the artist imagines the island of the future, now abandoned and partly covered in water due to global warming, opens new horizons to counter-cartography strategies, including premonitions as a means to raise ethical considerations.

BIO Jakob Kudsk Steensen brings together physical, virtual, real, and imagined landscapes in mixed reality immersive installations. Using a site-specific and slow media approach, he reimagines stories of overlooked ecosystems and of forgotten natural histories. His works are created through collaborations with artists, scientists, and natural history museums, including Michael Riesman, the musical director of Philip Glass's Ensemble, architect David Adjaye, and the Museum of Natural History in New York City and London. Jakob was a finalist for the Future Generation Art Prize at the 2019 Venice Biennale. He received the Serpentine Augmented Architecture commission in 2019 to create his work 'The Deep Listener' with Google Arts and Culture. He is the recipient of the best VR graphics for RE-ANIMATED (2019) at the Cinequest Festival for Technology and Cinema, the Prix du Jury (2019) at Les Rencontres Arles, the Webby Award - People's Choice VR (2018), and the Games for Change Award - Most Innovative (2018), among others.

▲ Jakob Kudsk Steensen,
Primal Tourism [2016-2020], virtual simulation of Borabora, video game engine.
Photos in the Video file: Photo courtesy of the artist.

● FEI JUN

Fei Jun has created an interactive video game consisting of two interaction modes. The first allows the public to create a virtual world using more than 300 objects that the artist has reconstructed from ordinary objects. The second interaction mode enables the audience to roam in the real-time rendered world via an iPad application on the exhibition's site. Users can interact with virtual worlds and create diplomatic relations between them, helping to build different worlds, sharing resources, or sabotaging others. Although the artist makes use of scanning techniques of real objects, the strength of his work does not lie in his representative power, but in his allegorical one. His work is a social experiment involving diplomatic dynamics for the collaborative construction of the representation of a virtual world.

BIO Fei Jun is the head of CAFA Media Lab, an associate professor in interactive media art and design, China Central Academy of Fine Arts as well as a working artist and designer. He is also a co-founder of Moujiti interactive. His art and design work has been exhibited nationally and internationally in galleries, museums, and at festivals and has received many international awards, including the IF design award. His artistic practice has crossed digital art, interactive art, experience design, interface design, interaction design, digital publishing, and other unknown areas. As an artist, he is particularly interested in the hybrid space that is constructed by virtual and physical space; as a designer, Fei Jun has been creating mobile applications and interactive installations for clients, including the Palace Museum, Audi, Trends Media Group and etc.; as an educator, he has been teaching an interactive art and design program in CAFA since 2005.

▲ Fei Jun, Interesting World installation 1 [2019], interactive installation, game engine, application.
Photo courtesy of the artist.