

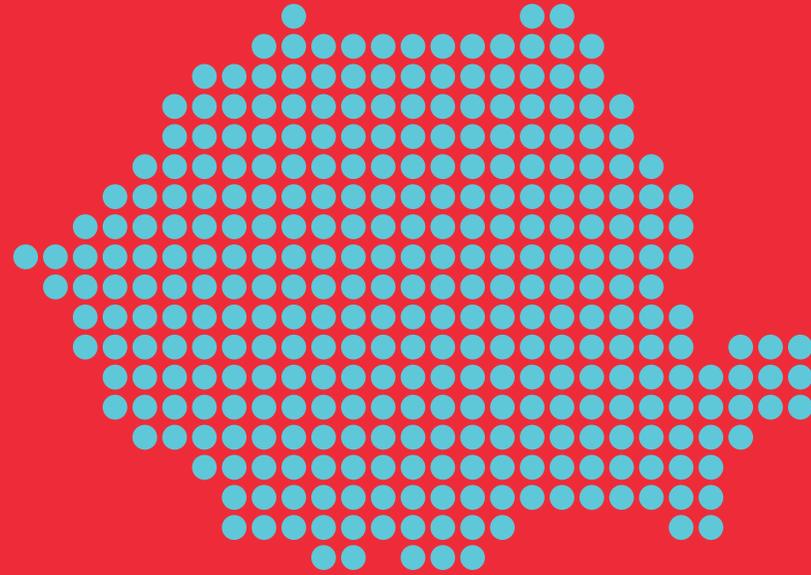
BEYOND THE OBVIOUS
2018 EDITION

ctrl+shift **HUMAN**

**Arts, Sciences & Technologies
in Coded Societies**



**REPORTING FROM
TIMISOARA, ROMANIA**



CREDITS

BEYOND THE OBVIOUS IS CULTURE ACTION EUROPE'S ANNUAL FLAGSHIP EVENT

Beyond the Obvious (BtO) creates a space in which to rethink culture and to explore its borders and edges. It aims to move beyond the conventional assumptions, beliefs and practices that impede the contribution of culture to social and economic regeneration at a local, national and European level.

BtO enables and facilitates collaboration between participants from different sectors of our societies seeking answers to common challenges by putting culture at the heart of public debate and decision-making. Each year, BtO connects the European cultural community with that of the hosting city in a mutual exchange beneficial to the empowerment of both communities.

BtO provokes thinking by challenging the traditional elements of a conference to spark inspiration and new dialogues. It does this by proposing different formats for speeches and conversations, by striking up unusual rhythms between institutional moments and unusual dialogues.

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Culture Action Europe aisbl (CAE) is the major European body drawing together cultural networks, organisations, artists, activists, academics and policymakers. CAE is the first port of call for informed opinion and debate about arts and cultural policy in the EU. As the only intersectoral network, it brings

together all the major cultural disciplines, from the performing arts to literature, the visual arts, design and cross-arts initiatives, to community centres and activist groups.

CAE believes in the value and values of culture and its contribution to the development of sustainable and inclusive societies.

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FOREWORD BY

**ROBERT MANCHIN AND
TERE BADIA**

Information Technologies (IT) can solve problems, accelerate decision-making and help complete complex tasks through self-learning processes. IT is often defined as a communication system that is universal, transparent, simple and accessible.

However, this is not 100 per cent true; technologies are neither neutral nor accessible and transparent. Algorithmic processes are now acting in direct relation to our infrastructures: beyond the purely functional transmission and transformation of data, they often perform invisibly and with bias. This means that there are political, social, economic and cultural issues that need to be addressed, because they determine the performativity of these technologies and are embedded in their design. We should be able to detect tactical and technical design choices, and to examine their potential and limits.

It is useful to explore the intersection between the possibilities of this hybrid condition and the awareness of the emerging patterns that lead to redefinitions of creativity, the arts, representation, globalisation and cultural production.

This debate follows many different paths, one of which concerns the segregation of the spheres in which ideas circulate online, the fragmentation of cultural digital content and the cultural and social effects of these new global content

platforms. How do we ensure the diversity of cultural content to overcome network effects, black box algorithms and big data influences on the creation of ‘new dominant cultures’? This leads us to question whether our digital environment, mediated by algorithms, could become a monoculture – a monochrome ‘bubble culture’ that loses diversity, plurality and even cuts the free circulation of cultural expression.

Beyond the circulation and distribution of non-material data, it is important to look into the material consumption related to IT and its environmental impact. Algorithmic processes require ever-growing infrastructures that are supported by human labour networks and which diminish natural resources. It is expected that, by 2025, the IT and digital content industries could account for 20 per cent of all electricity use. Digital vocabulary, such as ‘The Cloud’, distracts from this material dimension and most users remain ignorant of its consequences. Considering that the cultural industries are the biggest content producers and uploaders, this issue is particularly relevant and should be discussed within its broader political and economic context. There is an urgent need to ensure more sustainable and responsible approaches to content creation and distribution.

To approach these issues, it is necessary to recognise the strategic importance of creating a wider outlook beyond disciplinary boundaries, an approach that acknowledges the enormous possibilities of crossing knowledge and mediating through sectors. Science, Technology, Engineering, Arts and Maths (STEAM) initiatives bring together artists, designers, scientists

and engineers aiming to create a way to approach actual and future challenges beyond their disciplines. In other words, to create an inter-disciplinary position in which to decode complex problems through a mix of transversal competencies and unconventional thinking. Inter-disciplinarity here would mean to approach common goals without common ground and to acknowledge that this does not subject all participants to one disciplinary (or sectoral) worldview. Nor does it assume the possibility of a universal language; rather, it recognises that disciplines can be suspended to allow ‘out of the box’ thinking to find other ways to approach complex issues, because knowledge and experience are fundamentally heterogeneous.

As cultural agents and content producers, our challenge is to take on the responsibility of trying to understand the technologies that are shaping our world. Because this is the only way to be capable of taking critical decisions affecting institutions, organisations and individuals in their social, political and cultural practices.

THE LOGIC OF ctrl+shift BEYOND THE OBVIOUS

RAMON SANGÜESA

[SHIFTING CERTAINTIES BETWEEN THEALGORITHM AND THE ANTHROPOCENE]

The world has undergone profound changes due to the convergence of several trends, one of which is the redistribution of power brought about by ‘technocapitalism’. This is a form of political and economic power based on the creation and management of flows and spaces expressed as networks which, in turn, are supported by information infrastructures (Castells, 2010). These infrastructures are not only there to speed up the flow of information and data but also to host automated processes that operate on these data.

Over the years, the nature of these algorithmic processes has slowly changed. From being a set of fixed instructions working on the input data to transform and pass it on to the next node in the network, they are slowly being replaced by Artificial Intelligence (AI) processes, which make decisions about data, learn from its flow and improve its performance.

All these algorithmic processes operate continuously and without physical borders, as well as being inscribed in infrastructure and potentially interpreted as symbolic transformation. Beyond the purely functional transmission and transformation of data, algorithms influence other symbolic spheres: they are

redefining our individual and common identities and they put into question the current arrangements of common political spaces. They influence how public opinion is formed and they modulate or directly manipulate our ability to participate in the public sphere.

The connection between the algorithmic infrastructure of our society and its social and cultural spheres takes on many forms and operates at different levels. The most familiar one for many of us is social media, which profoundly affects how we construct our identities and engage in public debate. It has also become a vector of behavioural organisation and enculturation in a similar way as physical mass media did previously but now has unprecedented access to details of our private lives which, in turn, are again affected and modified by the influence of the algorithmic processes operating on social media. However, this circular influence is just aspect of the ‘algorithmisation of the world’.

Algorithmisation has other social consequences: the polarisation of the public sphere through social media is a well-known aspect that affects the organisation of ordinary life at many levels. This triggers changes in the self-perception of citizens and of their place in the community.

Algorithmisation has also fueled the expression of new types of identities, whose power sidesteps and implicitly questions many of the traditional political structures. As a result, new political organisations are appearing, from political networks for alternative resistance (both within and outside the state)

to new concepts of citizenship (such as ‘e-citizenship’). New cultural identities are formed in relationship to algorithmic logic but also through other forms of identification. New identities emerge from individual ‘technoselves’ (that is, technological identities) and their interplay.

The effects of algorithms go beyond the apparently non-material informational, symbolic and social spheres. Contrary to the common understanding of the algorithmic world as ‘non-material’, it heavily depends on physical structures which, in turn, use and put in motion vast bodies of material. All this affects the traditional construct of ‘nature’, and transforms it, too.

Algorithmic processes require massive physical resources. They are supported by ever-expanding networks of sensors, computers and servers. Natural resources are put under stress, either by the ever-increasing consumption of energy to keep computers, servers and other processors running, or by the sheer amount of specialised materials needed to build high-technology products. New tensions and struggles arise between political and economic forces that represent additional factors in the geopolitical distribution of power. Citizens, cultures, nations and states are all affected by these tensions, which become further aspects of the Anthropocene (the recently-coined name for the current geological age, in which human activities can be seen as the dominant influence on the planet). The impact on the different levels of state structures may even call into question our self-images, identities and narratives – in effect, entire national cultures.

This year's *Beyond The Obvious 2018* gathering, *Ctrl+Shift Human*, uses the now familiar computer command which combines the Control and Shift keys to explore how control is shifting through technology and how this affects people at individual and collective level, as well as their cultural expression. Let's not forget the irony of what usually follows – that is, the 'delete' key. This deletion may be soft or hard in the case of people caught in this new intertwined world where algorithms influence the Anthropocene age and the Anthropocene influences the growth of algorithmic complexity. What is the space and role of culture in this context? Is Ctrl+Shift+Del a resetting of all things human under the current algorithmisation of the world? Is this an end or a new opportunity?

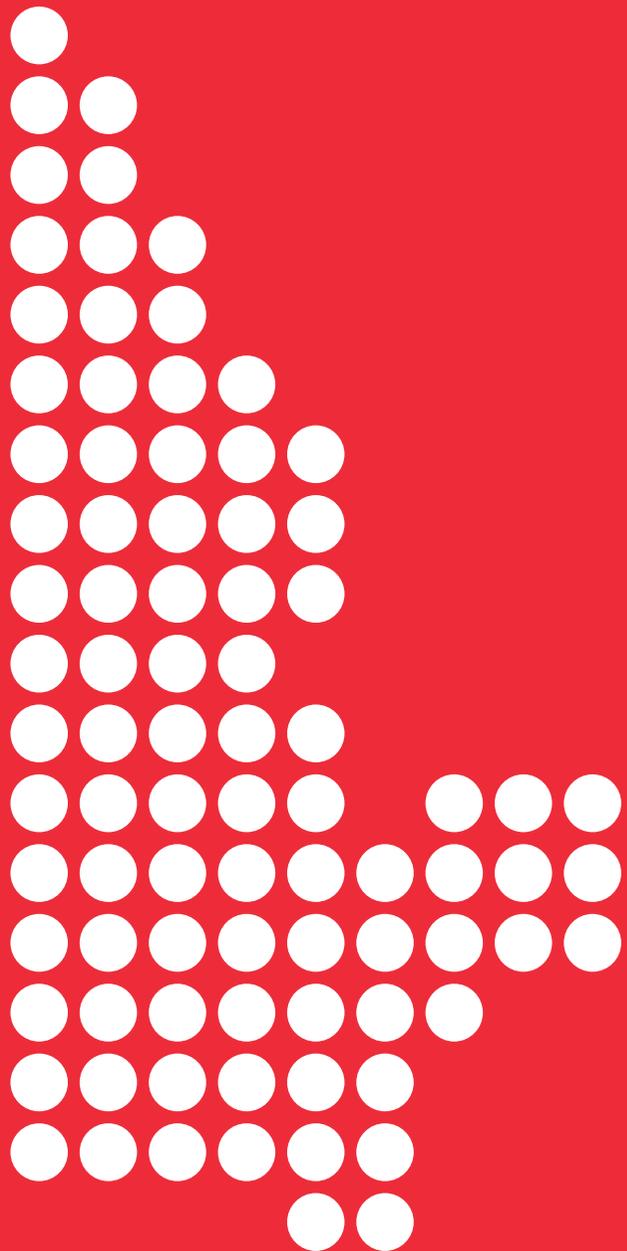
The *Beyond The Obvious 2018* gathering tried to explore all these issues and their relationships systematically. It hosted several intense plenary sessions, while keynote presentations and workshops were set up to explore different aspects: Intelligence (to question the interplay of artificial intelligence and culture); Participation (on how the algorithmic world affects citizenship and social lives); and Anthropocene, to illustrate the connection between the apparently non-material digital world and the rest of the planet. Finally, there were specialized sessions on cities as hubs of both digital activity and culture. A special session was devoted on how to organise new cultural institutions and what might be termed 'extitutions' to orchestrate projects in cities in these algorithmic times. A particular focus was put on the upcoming role of Timisoara, Romania, as European City of Culture 2021.

The meeting was organised around the following core themes:

- **INTELLIGENCE and its effects on REPRESENTATION and PARTICIPATION and the role culture might potentially play**
- **BODIES in relation to the empowerment of CITIZENS in the ANTHROPOCENE through culture**

The main way to communicate what turned out to be very different points of view, attitudes, expectations and knowledge on these subjects took the form of presentations (CTRL) and workshops (SHIFT). A special format for intense interaction between participants was based on sharing their STORIES about their projects in relation to all the previous concepts.

In the following pages, we try to convey the contents and dynamics of two and a half intense and exciting days. This would not have been possible without the contribution of many people in different roles. As a co-ordinator of the reporting of *Beyond The Obvious 2018*, I am specially indebted to the rapporteurs and would like to thank them again for their dedication and hard work.



ctrl+shift INTELLIGENCE

THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE AND ITS INTERPLAY WITH CULTURE

Type of session:

Keynote

Speaker:

Chris Csikszentmihályi
(Madeira Interactive Technologies Institute)

Presenter:

Alex Meszmer

Reaction:

Vladan Joler and Fieke Jensen

Focus:

**An exploration of the origin and evolution of AI
as a contemporary practice, culture and means of
power, plus a proposal for the role of culture in
relation to this.**

Questions:

What is AI in reality?

How has it evolved from its beginnings?

What are the main concepts beyond the technical?

How can AI interact with culture?

This keynote session was introduced by Alex Meszmer from Visarte, who stressed the increasing importance of machines and their control over us. He remarked on the importance of AI as a vector of culture and opened up the question of whether its operation and, more precisely, its effects as a cultural tool can be controlled.

Chris Csikszentmihályi started by focusing on the way that people currently talk about algorithms and AI. He asked why we are so obsessed by these concepts and why we see them as something ‘new’.

It is clear that the reason we are talking so much about these subjects is because we are feeling their effects and because, in a way, they have become part of the fabric of our lives. Chris remarked that one of the ways this has happened is through the rise of ‘persuasive technologies’ – that is, the role that advertising has attained online as a means to create a sustainable economic model for Internet use. The apparent solution has been to create a ‘persuasion machine’ that provides hyper-targeted advertising to individuals. For this to work, it needs more and more information about individuals, which then has to be subjected to more and more sophisticated computational treatments in order to extract valuable information from each individual’s interests. It is here that techniques from AI, namely ‘machine learning’, have come to the foreground.

The use of these techniques has exploded in recent years and has become more and more controversial, since they

not only offer a choice of alternatives but also effectively change the way we make decisions. Such techniques have also been applied to spheres beyond the purely commercial, particularly in political manipulation, with the Cambridge Analytica scandal probably being the most notorious case. This has perhaps signalled the turning point in the process of disseminating AI and its place in the public's consciousness. Even so, these techniques, and AI in particular, have been around for a very long time.

Chris then invited us to explore the evolution of AI and the culture of the people who are creating it. He started by going back to the first attempts at automatising labour. Although one can trace back a semblance of such machines to the Greeks and other ancient cultures, the main developments took place at the beginning of the Industrial Revolution and they triggered some very violent reactions – for example, the Luddite movement, the members of which destroyed the weaving machines that were replacing human labour.

[WHAT IS AI?]

There is also another 'ancestor' of AI in the past that can be found in the area of the simulation of human abilities: the creation of human-like automata such as those developed in Europe by Vaucanson, or the *Karakuri* of Japan. Automata in the European courts and salons were meant to be a kind of

diverting novelty and performed a kind of ritual role in Japan. In contrast to the European view of the automata as an entertainment or a menace to labour, the Japanese did not have such negative views due to their animistic view of the universe, which extended to all types of matter and beings, including machines. This view continued to the present day and exemplifies the positive attitude of the Japanese towards the automation of labour. Consequently, Japan has been one of the first countries to embark on a massive program of robot development, not just for industrial labour but also in personal care, particularly for the elderly.

The idea of robots became popular after the introduction and adoption of the term in works of fiction, of which Karel Capek's *Rossum Universal Robots* first popularised the term; it also connected the word to a negative perception of the idea of artificial beings with human-like abilities, such as intelligence.

In the 18th and 19th centuries, the use of automata proliferated and were famously used in frauds such as the well-documented case of the 'Mechanical Turk' chess-playing machine which toured the courts of Europe. Edgar Allan Poe exposed the fraud by reasoning that the movements of the mechanical player had to be performed by a small person hidden in the box inside which the chessboard was placed, as turned out to be the case in reality.

These aspects of the simulation of life-like and human-like properties, as well as the associated creation of fakes, might make us think that AI itself also has a history of lies and manipulation.

However, true AI can be identified with a research program that started with cybernetics but which became a field in itself after the now famous Dartmouth conference of 1956. From that moment on, AI was understood to be the creation of new methods to code computers with aspects of human intelligence.

At the beginning of the development of AI, there was a predominant view that one could attain the goal of an intelligent machine by means of manipulating symbolic systems, especially systems that could be dealt with by ‘automatic logic’ – that is, automatic logical reasoning by deduction. There were initial successes based on this approach, where computer programs took the description of a problem and performed logical reasoning on it to deliver a response. Decisions were thus attained by reasoning.

At the same time, other researchers favoured an approach that directly mimicked or simulated the structure of the neuronal tissue to perform ‘intelligent’ tasks. At the time, these other ‘neural’ or ‘sub-symbolic’ techniques were fiercely denounced and deemed ineffectual even for simple classification problems.

Some years later, the first ‘winter of AI’ arrived, when the computational cost of AI systems based on reasoning proved to be too high and the systems too fragile to respond to changes in their context of operation; they would abruptly stop. Also, the massive amount of time needed to ‘extract knowledge’ from human experts whose expertise was formalised, represented and transferred to the automatic system was a factor in the spreading and adoption of these technologies.

On the other hand, from 1987 to 1995, solutions based on ‘neural networks’ experienced a resurgence and is today the area that receives the most funding, at least in commercial endeavours. The down side is that the sheer complexity of present neural networks, the ones used in the much-publicised ‘deep learning’ systems, is so big that it is almost impossible to understand how they work and how they behave.

Today, we have a situation where AI systems are quite successful at some tasks but we don’t understand the systems actually performing them. The AI that works is largely unexplained, unlike physics or chemistry. This is a very strange situation, and a potentially dangerous one.

[THE CULTURE OF AI?]

AI is a human activity, the main participants of which are the engineers developing it. As with any other people, they are influenced by the culture in which they live. As a group with a common identity, they share some peculiar cultural traits.

However, in the culture of AI there is some attempt to conceal that fact that it has a human side. In a similar vein to other scientific and technological disciplines in the areas of science and technology, people inside AI try to disassociate their involvement and biases from their work and give a number of reasons for this disconnection by presenting AI’s evolution as an independent, autonomous entity.

Another interesting aspect of this culture is that it is very ‘Cartesian’. Many pioneers of AI actually disliked the idea of ‘the body’, an idea which can be tracked back to some aspects found in the concept of the Singularity – basically the idea that human beings, their intelligence and consciousness are something totally separate from their physical manifestations as flesh and bone.

A further aspect that people in AI culture share is the way they see the evolution or ‘arrival’ of ‘real’ AI: it is deferred to an ever-receding future. In the profession, there are several views on this. For instance, while one group may be confident that AI systems will become self-conscious in years to come and develop superhuman intelligence, others deny that possibility or are highly skeptical about it.

In the meantime, AI systems are being developed in many different fields and advances are being made. However, the applications that had experimented with a fast development in the past and had an impact on our idea of our own humanity are now stalling. For example, after the fast-paced increase in availability of chess-playing systems, now it seems that a limit has been reached. The accumulated expertise is now being transferred to other game-playing scenarios such as Go. Nevertheless, they have changed many aspects of chess as a culture: the consideration of chess as a human activity, the way that the game is learned and played or the way that chessmasters are considered by other people has been altered for ever.

More and more, we see new areas of AI application becoming entangled with governmental and societal control processes. China is cited as one of the most clear examples of that, but AI is also being used extensively in other countries by governments to implement control strategies. AI has become a tool and an expression of power.

[THE RISE OF AI POWER]

The power of AI is on the rise, particularly because the way that it is built is mainly through processes of ‘machine learning’ (ML); these, by definition, work on data to create knowledge that will be used by the AI systems being built. Thus, AI systems make their decisions using knowledge extracted from data by ML.

The tremendous growth of data gathering technologies which harvest data from many different sources has made available a huge amount of material to help automate the creation of AI. In addition, the availability of AI has made possible to treat such data in ways that were not possible before. AI needs data and most of the time data means data about people. Therefore, indirectly and mostly inadvertently, people become workers in the AI field merely by using the Internet or walking in cities that are continuously under camera surveillance. The e-commerce company, Amazon, has made explicit the fact that real human people can be treated as workers for AI by creating

a platform where actual people are performing simple tasks that may appear online as the result of an ‘artificial intelligence’, platform called ironically called Mechanical Turk.

We already know that the use of AI with ‘big data’ on many people’s personal information can have malicious effects, as has been described in books such as Virginia Eubanks’ *Automating Inequality or in Algorithms of Oppression* by Safiya Umoja Noble. These practices are organized into exploitative systems known as ‘platform capitalism’.

Beyond the commercial arena, systems that use AI to predict crime in cities are already in use by different police departments. Projects using ‘social credit’ based on how citizens perform and fare according to an automated AI system allow citizens to have access to, or be excluded from, a particular service. Indeed, it is a world where AI is serving to control and steer the ‘correct’ behaviour of each citizen.

This is clearly a situation that should be subjected to critical practice. Phil Agre, an AI researcher himself, proposed the need to perform ‘critical technology practice’ which is also a possibility for practitioners of other disciplines that aim to confront the current state of affairs around technology, and AI in particular. There are many projects now taking this approach – for example, Chris Csikszentmihályi’s project about using robots for street demonstrations: police will then smash robots, not people.

The question is then, who uses AI and how will it be used? The cultural sector should continue to be critical about everything connected to these questions.

[REACTION BY VLADAN JOLER AND FIEKE JENSEN]

In their reaction to Chris’ presentation, Vladan Joler explored the connection between AI, their own practices and a broader scope which starts with data but extends into the material world. He placed AI in the logic of the current version of the capitalist system in which we live and identified it as a ‘cognitive capitalism’. He explained that he thought we needed to go beyond the simple association of this type of capitalism with data or algorithms operating in a vacuum and commented that he was intrigued about other aspects such as the flows of materiality and power that AI simultaneously generates and is embedded within.

He then stressed that the culture of AI also affects humanity and the physical world on many different levels that connect the world’s resources, materials, commerce, and labour conditions, among other spheres. He briefly explained one of his latest projects – entitled *Anatomy of an AI System* – that he led with Kate Crawford and revealed and mapped these connections.

Anatomy of an AI System explores the ramifications that make the operation of a typical AI system possible. Joler, Crawford

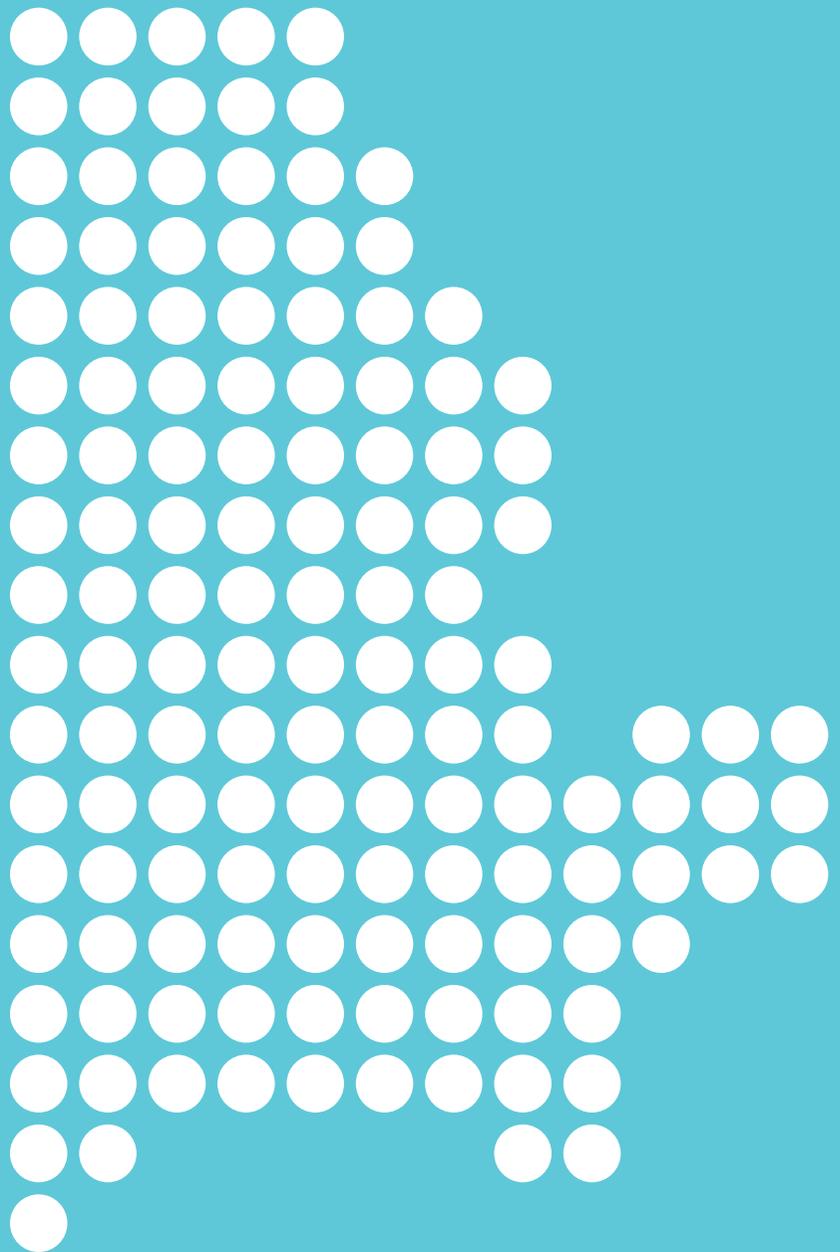
and their collaborators painstakingly connected flows of information with the hardware that makes them possible. From there, they discovered the materials needed to build that hardware, as well as how it materialised the cognitive patterns of the decisions the AI system made. This, in turn, brought them to the places, countries and conditions from which these materials were obtained; that sphere then opened up a world of interconnected networks of international commerce, trade agreements, neocolonialism, and exploitation.

On a different plane, a connection between ‘knowledge economies’ in developed countries and material labour in other countries that were producers of the specialised minerals needed for hi-tech devices emerged. Joler mentioned that there was, in a sense, a similarity at different levels between the various network structures their investigation discovered.

He commented that mapping was a method that helped him discover new relations within a given domain. He had applied this method to different projects dealing with the deconstruction of information technologies (IT). They helped him reveal both their materiality and the networks of power that exist around them. He felt that AI was no exception, and that through mapping, visualisation and the knowledge about the different networks that one could extract from mapping, one could be in a position to effectively communicate a critical reflection about IT in general and AI in particular.

Fieke Jensen then developed some points that Chris Csíkszentmihályi had made in his presentation, particularly those about the human factors involved in the building of AI systems. She commented on the fact that automated decision-making systems were all-pervasive and were a codification of the values and attitudes of their builders, either by the datasets used to train the AI systems or through the explicit coding of ways to select and decide within those systems made by their programmers.

AI algorithms classify people into cultural categories which can effectively change their lives. She felt that there was a lot of criticism to be made about how the AI industry works and its consequences. She commented that a complex collaborative approach from different fields should be favoured to effectively communicate the consequences of AI and algorithmic systems in relationship to justice and the fair treatment of individuals and organisations.



ctrl+shift REPRESENTATION

HOW DO ALGORITHMS WORK ON THE MAJOR ONLINE PLATFORMS AND SOCIAL MEDIA?

Type of session:
Workshop

Facilitator:
Vladan Joler (SHARE Lab, Novi Sad University, Serbia)

Focus:
To present mapping as a possible way to reveal the underlying networks of power, material flows and other aspects underlying our current algorithmic infrastructures.

Questions and topics:
How do networks implement surveillance, filtering and censorship?

The importance of metadata

The structure of personal data exploitation

The possibility or impossibility of 'top down' control

Joler's recent work has explored and attempted to understand what goes on behind the monitor screen, through the processes of analysis and mapping. As users, we are stuck to the interface, but we rarely question what goes on underneath its surface.

[INFORMATION 'WARFARE']

Various 'attacks' happen at the points through which information passes, such as tools and interfaces, devices, Internet infrastructure, networks, data and hosting centres, news portals, online communities, blogs, social media or search engines). These can be seen as emotional filters and have influenced how we see and process reality. There are many technological and creative players processing information between input and output, influencing what we see and how we behave.

Joler's interest in data is long-standing. It may have started when he worked with American-Iraqi artist Bilal Gallip in an attempt to quantify radiation and gather and publish data using the open science website Safecast, which measures data and uploads it to a collaboratively constructed map. The project took place in a destroyed military building in Kosovo. At this point, Joler felt like he could see the invisible, a shift in focus which brought him to the most invisible thing one can attempt to visualise: the Internet.

[MAPPING THE REAL INTERNET AND ITS INHERENT DECISION-MAKING POWER]

In an attempt to map the structure of the Internet, he sent ‘ping packets’ – that is, packets of digital information used to test network response times – to trace the routes to IP addresses on the Internet. Each country has a range of IP addresses, which are distributed to different Internet Service Providers (ISPs). The packet touched each device in Serbia that accessed the Internet, and what came back was information about the devices that the ping packet had touched; through this he was able to visualise the corresponding networks.

So what can this tell us? Each corresponding step in the Internet journey of the ping packet is able to generate, choose, collect and filter information. How those dots are connected represents the network’s levels of filtering, censoring and surveillance – that is, the places where data is most likely to be filtered through decision-making algorithms.

The next step was to try to visualise how data flows between the most visited websites, in order to find out who is able to influence, monitor or stop the flow of data; seeing this infrastructure also shows different political stories. Joler shared a comparative example of submarine telegram cables sent between the UK and US in the 1950s and colonial cable lines between the UK and India.

This infrastructure is a way to think about systems of power, and the same principles can be applied to the infrastructure of the Internet. For example, the American artist Ingrid Burrington created a project called *Networks of New York* (Burrington 2016), which was centered around a code of signs drawn on the pavement to mark cables belonging to ISPs in New York, created by network enthusiasts there. Burrington created a manual to read these signs, which gives information about where the cables are and which company or ISP they belong to.

[APPLYING MAPPING TO ONLINE PLATFORMS]

This type of thinking can be applied to other types of systems, in particular to our most-used online platforms. The websites we use collect information via lines of code in a webpage, which are commonly referred to as ‘cookies’. Of the websites we use, 95 per cent send data to Google via cookies and approximately 50 per cent send data to Facebook.

From this, it is clear that the ‘surveillance economy’ is the main economy of the Internet. Cookies and algorithms capture big data, which are analysed and sold to companies – this is how the Internet is financed. Within each website, the cookie in the code sends certain datasets to build a picture of how an individual user behaves online – this is called the ‘customer journey’.

On your mobile, you give permissions for apps (and therefore the companies behind them) to access thousands of types of data, creating a multidimensional ‘datascape’ that captures a multitude of behaviours.

The new resource in this surveillance economy is our emotional landscape. The Internet brought the possibility to expand this landscape indefinitely.

[THE ‘SURVEILLANCE ECONOMY’ AND ITS IMPLICATIONS]

When Cambridge Analytica sold data to political groups, they essentially sold scans of our emotional landscape. This gave the buyer the ability to time and target advertisements and use language that appealed to the digital representations of different people.

Is there any way to control this? In most cases, it is left to the user the task of accepting or rejecting the access to their data. Most of the times this amounts to deciding whether or not to use an application or service or not. The issue now is that the cost of stepping out of the digital world is too high for most users not to accept these ‘entrance fees’ – that is, to let their personal data be used.

Individuals are controlled through the data banks related to their ‘digital self’ or ‘technoself’ and many corporate actors can buy

and control our digital selves. For example, if you want to apply for American visa, they can look at your social media profile to see if it conforms to their standards. If you don’t have a social media profile, it looks suspicious, and this becomes a further push to use and accept the various social media platforms. The idea that you are being watched then censors your behaviour.

This is a process of ‘normalisation’ and exerts control over individuals. Most people are not aware enough to censor their own behaviour when at home, and if they are not aware of the data they are sending, they cannot act to control it.

The sheer amount of exploitation and wealth being generated from our data is still unknown, partly because we don’t know the amount of our data that is being used; even more so, since the relation between data is also important and a source of exploitation. Data about data – ‘metadata’ – is very valuable. To paraphrase CIA whistleblower Edward Snowden: content is not important, but metadata tells a story.

[THE POWER OF METADATA]

But how can someone obtain metadata? As an example, Joler demonstrated a project relating to Hackingteam (www.hackingteam.it), a commercial IT company working out of Milan, Italy. They are cyber weapon manufacturers making tools for government agencies to access what we do

online. At one point, someone leaked their email server to the Internet and Joler decided to work with it in order to specifically explore the newly available metadata.

It provided a collection of very basic datasets:

- **Who emails were sent from and to whom**
- **The dates and times**
- **IP addresses**
- **Subject lines**

Joler showed a range of ways in which he was able to manipulate the data using algorithms to detect meaning. He filtered the data to look for the top 10 people who were communicating between each other, which he visualised in a way that revealed the organisation's structure through the metadata analysis.

Then, he turned his attention to the main external contacts and collaborators. Through IP addresses, he gathered the types of organisations Hackingteam were communicating with, one of which was NICE (www.nice.com). The metadata revealed close communication between the two companies, and further investigation revealed that NICE were selling the same software to large companies to perform surveillance on their workers.

He then ran a 'pattern-of-life' analysis on the metadata; this showed the patterns of behaviour of individual employees by the regularity of their emails and other communications. Joler was able to deduce that: "Pattern recognition and anomaly

detection are two sides of the same coin". By looking at the regular patterns of behaviour, he discovered various anomalies through cross-referencing data from different days. For example, some revealed the shift in time zone when employees travelled abroad, and a frenzy of email activity when the company was in the mass media.

Joler and his collaborators also looked at the subject lines of emails to identify what the company ordered from Amazon to see what kind of technology they were buying, the books they were reading and other activities. The company has an agency who buys their travel tickets. Extracting travel information in the email subject lines revealed how their employees travelled around the world to sell their tools and cross-referencing this data with IP addresses helped identify where the meetings were taking place.

The purpose of the analysis was to see what information could be extracted from a dataset, and from a mere four basic pieces of data, a multitude of information was gleaned. Thinking about this in relation to the thousands of datasets we share every day through our phones and computers demonstrates the depth of information that is being or can be exploited. In general, the analysis of this data is done, not by humans, due to the sheer volume of information, but by machines that use ML and other AI techniques.

It is worth noting that companies such as Google seem to be more interested in pattern recognition, while one could say that police and governments are more interested in anomaly detection.

CULTURE UNDER THE ALGORITHM

Type of session:
Workshop

Facilitator:
Fieke Jansen (Cardiff University, Wales, UK)

Focus:
**Algorithms, their characteristics and myths
and their connection to culture.**

Questions:
**What are algorithms and what is an
algorithmic culture?**
How can algorithms be deconstructed?
**How are algorithms related to our social
and political lives?**

This workshop started with an invitation by Fieke Jansen to explore the concept of the algorithm, since the focus of the session was to be on finding the ways that algorithms impact on culture and effectively create an ‘algorithmic enculturation’ process.

But first, we needed to find out how much participants actually knew about algorithms. The common ideas of participants about what an algorithm is were quickly established, along with an idea of how their lives were affected, and this initiated a debate about the wider implications of algorithms. The workshop then proceeded to illustrate the different realities of the use of algorithms in everyday life and how they impact on us.

This first stage in the workshop highlighted the prevailing ideas of the participants about the nature of algorithms and elicited the following responses:

- Algorithms were associated with **paranoia**: that was an impression which appeared in several different sessions during the *Beyond the Obvious 2018* conference. Algorithms have been brought to the foreground by a number of different problematic but well-publicised examples – the Snowden revelations or the Cambridge Analytica scandal, for example – that had awoken participants’ perceptions of the misuse of this construct.
- For some participants, algorithms were a **very complex mathematical concept**. This is partly true, since the idea of algorithms was first conceived of in ancient Arabic mathematics. The mathematician Muhammad ibn Musa al-Khwarizmi (his name became the designation

of the new entity, the al-gorithm by latinisation) came up with the idea of a finite process that formalised a series of steps to solve a problem, initiating the life of algorithms as numerical phenomena whose properties could be mathematically studied. However, the perception of the mathematical complexity of algorithms by participants came mostly from the idea that algorithms are connected with vast amounts of data on which sophisticated calculation and processing operations are performed.

- Participants also identified algorithms as **logical processes** – that is partly in accordance with the mathematical definition of an algorithm since the ‘finite process’ can be one that performs logical operations. More interestingly, this idea of an algorithm as something related to logic also connects them with logical inference or reasoning. This effectively shows that algorithms – in the participants’ minds and opinions, at least – are in accordance with one of the goals of AI: that of replicating cognitive processes by means of algorithms, of which reasoning is just one.
- Participants recognised algorithms as something **integrated into every part of our lives**, not just in our technological devices, of which the smartphone was the most cited example. They understood that algorithms now operate in many other settings; among the most frequently mentioned were cars, cities, banks and Facebook.
- Some participants remarked that algorithmisation is in some way related to **standardisation**. They felt that there was a ‘uniformisation’ in the description of data and its processes which is induced by the prevalence of algorithms. This also informed the idea of uniformisation or cultural homogenisation through the use of algorithms.

- While the risk of homogenisation was clear, other participants also mentioned an **adaptive dimension in algorithms**, since they thought that they somehow depended on the context in which they were used. In a way, this is encapsulated in the very definition of the word ‘algorithm’, since the data that is input into an algorithm can change its content in different moments and, consequently, modulate an algorithm’s behaviour within a certain range of possibilities. But, participants had sensed that current ‘intelligent’ algorithms were able to perform a more complex adaptation and identified some algorithms’ ability to ‘learn’ as crucial to that process.
- This evolved into the idea that algorithms **should be able to take into account the cultural words used** and adapt to the different societal settings they operate in. There was a discussion about algorithms as something that could be used to influence and steer cultural values. A discussion ensued on how this actually becomes a new form of cultural colonialism. A concern about how to redress this trend and have some control over it followed.
- As a prerequisite for the control of the effects of algorithms, some participants emphasised the need to **make algorithms easy to interpret** by the public, since this could be a basis on which to open up informed debate about algorithms and their effects.

In order to illustrate the inherent difficulties in the conceptualisation of algorithms and their desired properties, Fieke Jensen conducted a simple exercise which consisted in inviting participants to describe an algorithm for cooking an egg. The exercise made evident many of the inherent subtleties and difficulties in creating algorithms.

Participants came to several conclusions after writing their algorithms for a recipe; these can be itemised as follows:

- Algorithms are **difficult to write**. The difficulty stems from the ambiguity of our ‘natural’ concepts of what an algorithm is. Natural language is too imprecise to help us define a clear set of instructions that operate on a set of objects or, more adequately, on the representation of the objects that are affected by the algorithm – that is, on data. This explains why specialised formal languages to write algorithms (in other words, programming languages) were created in the first place. The specialisation of these languages creates a barrier for non-specialists inspecting an algorithm. This problem is profound, even confusing specialists in the subject. Given current work practices in companies’ programming departments, experts do not always have a total understanding of the objects an algorithm is dealing with and the steps it follows. In consequence, algorithms are becoming ‘black boxes’ (Pasquale 2015), even for such specialists.
- **Algorithmic thinking is machinic thinking**. The participants realised they had to think not only in step-by-step fashion but also in a black-and-white, yes-or-no, binary way. They acknowledged that human thinking proceeds in different ways and uses fuzzier and more fluid categories, as well as more flexible descriptions of processes. This need for translation into ‘crisper’ language added to the difficulty of writing algorithms. Not only this, but one had to be extremely precise in the description of their context, data and actions.
- **It is not obvious how to think about all the steps involved in the process**. Participants mentioned that there is always some likelihood

of incompleteness in the process of writing an algorithm; that is, the reality in which the algorithm has to operate may be incompletely described in terms of the input data needed, or the procedures included in the algorithm may miss an important step. These missing aspects are difficult to spot or anticipate, and changes in the environment only add to this difficulty. Algorithms have to be adapted in response to changes in their operating environment, and thinking of all the information needed to complete such an action is difficult.

- As participants felt that **any algorithm should also be capable of being understood by humans**, more conflicting requirements would be put on the acts of designing and writing an algorithm, since not only should it be interpreted by the machine running it but also by the people designing it – in this case, its collaborators and users.

From this discussion, the session moved on to explore some of the myths around algorithms that have become widespread.

[THE ALGORITHM AND ITS MYTHS]

The way we think about the algorithmic world is so much ingrained in our daily experience of issues such as the creation and use of big data, that it is a surprise to actually expose the myths that muddy our perceptions of the algorithmic world.

One of the most predominant is the myth of ‘**perceived neutrality**’. As also sometimes happens in the perception of

other scientific or technological issues, there is a tendency to ascribe a neutral or objective quality to algorithms. However, one should be cautious about this perception, perhaps by reflecting on the previous discussion in the workshop.

It is clear that there are a lot of decisive points in the process of creating and applying algorithms: how the context is defined, who defines it and which data should be taken into account (and which not), for example. These are just a few of the choices involved, made by people with their own interests, goals and views on the context where an algorithm should potentially operate. So, there are many subjectivities involved in the construction of an algorithm and it is unwise to tag it as a ‘neutral’ process.

The reality of the construction of algorithms is complex and involves a number of people. Typically, programmers re-use previous algorithms, constructed by others and shared through software libraries. This, together with poor documentation and an increased pressure to speed up the production of computer programs (that is, the implementation of an algorithm in a precise programming language), creates a situation where rarely, if ever, is there a single person who knows everything about how a given program works. The situation has been acknowledged for years in the industry and the actual production process has shifted to an interactive series of tests of different sets of data to see if the algorithm performs as intended under different conditions.

This state of affairs breaks also the myth of **transparency**, that is, the hypothesis that if you make public the code of an actual algorithm, people will be able to understand not only its workings but also its consequences. Attaining ‘algorithmic transparency’ is such a demanding task that a whole new discipline has emerged in recent years to create work practices and formal processes to achieve this state. This is understood as helping laypeople understand the effects of the operation of algorithms, including their effects on humans. This involves, among many other things, checking if an algorithm reproduces or amplifies biases, promotes exclusion and discrimination or performs unfair treatment of a given person or collective – see, for example, work by Eubanks and the conferences entitled Fairness and Transparency in Machine Learning (fatml.org) or Data and Lagorithmic Transparency (data.org). Efforts to create privacy, fairness and transparency by design in the way algorithmic systems are built are well underway but it is an uphill battle with the internet ‘powers that be’.

The fact that algorithms interact with data introduces a certain ‘**power asymmetry**’ between those people who actually produce, collect, own, pay for and analyse data, and those make money or create some type of action (political for example) from the analysed data. These are the main roles in the present algorithm ‘ecosystem’.

The resources available for each type of person are extraordinarily different in terms of the power on how to act in the application of algorithms and data. We all produce

data – not just from our use of the internet but just by simply walking through our cities. Not all of us are technically and economically able to have the necessary resources to analyse data or regulate its use.

[CULTURE IN THE AGE OF ALGORITHMS]

From the moment, we think about algorithms, we are taking our culture into account. Normative visions are encoded into algorithms running on the key platforms, which reflect the mores of Silicon Valley and of other important players on the Internet.

Currently, the algorithms which govern social media and content distribution reinforce the creation of ‘opinion bubbles’ which result in the fragmentation of the social sphere into uncommunicated spheres where the worldviews of different unconnected groups are reinforced by the sharing of opinions solely with their peers. This effectively creates a reductionist picture of reality and favours confrontation because opposing or contradictory views disappear from the informational horizon.

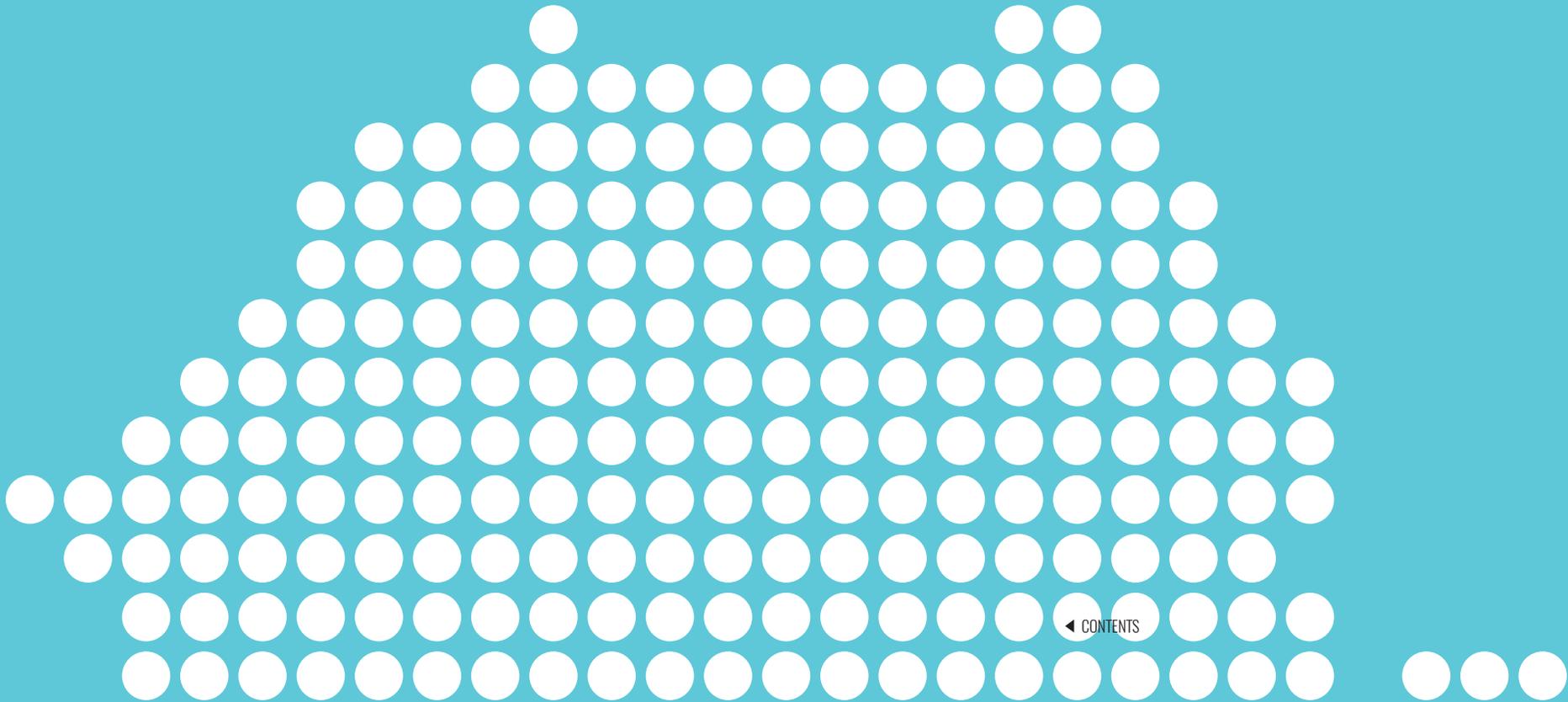
The replication and entrenchment of stereotypes are not only confined to the online world; normative body-typing in bio scans – such as in security scans which misrecognise and ‘flag’ divergent body forms, for example – is also an issue.

There was then a workshop discussion about the power and the obligation of governments with respect to the current state of affairs as it affects the rights of citizens and their access to culture. Should it be the state’s responsibility to ensure that social justice is encoded into algorithms and that key social systems such as health services are accessible by everyone equally? A more widespread effort in dissemination is clearly needed. Many of the participants felt that there should be a better distribution of tools designed with security in mind, or publicly funded by organisations that have the protection of individuals from data abuse as their goals.

A need and opportunity for cultural ‘actors’ to help people know about this state of affairs was also underlined. Coders and designers were believed to have a responsibility in terms of which type of algorithms and interfaces they build. Interfaces are more important than usually is acknowledged, since they are not only the means by which people come into contact with algorithms, but also how they actually work and affect people.

The future oscillates between the adaptation to different cultures which are algorithmically defined and the critical confrontation of the excesses and dangers of an algorithmic culture.

ctrl+shift **BODIES**



CITIZEN STEWARDSHIP IN THE ALGORITHMIC AGE

Type of session:

Keynote

Speaker:

Nicola Triscott (Arts Catalyst)

Presenter:

Lars Ebert

Reaction:

Joana Moll and Ramon Sangüesa

Focus:

What are the effective means to mobilise and empower communities through artistic practice while interacting with the algorithmic world?

Questions and topics:

How are artistic practices, the environment and the algorithmic world connected?

How can affected communities be involved in the control of their own environment?

What are the roles of 'cultural agents'?

What are the crucial aspects of effective projects?

Nicola Triscott, a producer for Arts Catalyst, approached the interaction between citizenship, art and science, and explored the changes brought about by the algorithmic world.

She reviewed the way Arts Catalyst – a multidisciplinary, non-profit, contemporary arts organisation – connects different worlds, using artistic practices to create imaginative projects, exploring issues that are important and urgent for our times. Its approach is to engage several types of people – artists, scientists and citizens – to create projects that follow a laboratory dynamic in order to explore tactics and strategies to confront issues. Over the years, they have refined a way of working that is aligned with other methods of enquiry in different disciplines, and consequently they are interdisciplinary by definition and experience.

For *Beyond the Obvious 2018* – and in response to being invited by its organisers – Nicola centred her reflections on the deep connections which the work of Arts Catalyst has with algorithmic systems – that is, how algorithmic systems connect with the research and practice commissioned and supported by the organisation.

She began by considering the relationship between arts and computing. With the rise of computer technology, many artists became excited about algorithms and this was most apparent in the emergence of computer-based and digital art practices.

However, in recent times – and especially in the last decade – algorithms have become significantly broader and more amorphous. They are embedded everywhere – algorithms shape us and we shape them. They are implemented throughout the prevalence of computational language and new devices and this ubiquity creates feelings of both excitement and concern. Where are these technological advances really taking us?

To formulate an answer, Nicola started by remarking the role of artists as ‘synthesisers’. They are hackers and storytellers, and as such, well placed to engage in and explore complex systems.

She illustrated this by discussing several projects that demonstrated this fruitful role – for example, the interactive installation *SilversAlter* (2002) by Gina Czarnecki, which tackles the topic of algorithms and identity. This takes the form of a large-scale projection within which human forms ‘live’. As the audience moves within this space, the figures represented in the work change in response to the visitors’ actions. The audience shapes the flow of random mutation of the digital human forms, directing the evolutionary course of these figures in a real-time experience. This physical interaction encourages social, physical and verbal interaction between viewers.

Exploring the development of consciousness and science, *SilversAlter* gives the audience the power to create, eliminate and immortalise their ‘created’ offspring via data image banks and DNA profiles. Generations are displayed in a growing archive of screen-grab prints pinned around the space – a

record of the changing population over time. Decisions – and their effects which are shown generations later – can be viewed as ‘evolution’ in fast-forward mode.

This work raises questions regarding the extent to which we are prepared to participate in our self-made possibilities and, by implication, that which we aspire to make possible for ourselves.

There are other aspects of this subject which are connected to the way in which contemporary science is shaping our understanding of race and migration. The emergence of genetic information and DNA databases of biometrics represent ‘technologies of identity’. In some respects, they are promoting a culturally reductionist idea of identity solely focussing on the individuality of the body. It is not representative of an individual’s story or of any other type of journeys, beyond biology. In a similar way, algorithmic systems can accurately reveal bias in the data being used and then propagate that bias in discriminatory ways.

[ALGORITHMS AND ENVIRONMENTS]

Algorithmic systems are shaping environments and biospheres. They are all around us and they underpin global resources; they facilitate global trade flows; they form the basis of all ‘environmental monetary technologies’ and they are very powerful in shaping our choices and decision-making in relation to services, consumption and travel.

The environmental impact of computation media systems is a significant contribution to how the Anthropocene is being formed and influenced.

It is difficult to confront and steer this deep relationship between two apparently separate but nevertheless interacting spheres: the algorithmic world and the biosphere. However, there have been efforts to provide guidelines for action and development, such as the *Biosphere Code Manifesto (BCM)*, a set of environmental principles relevant to those taking part in the algorithmic revolution. Here is a brief summary – the whole *BCM* can be accessed at the associated website (see References).

Principles of the Biosphere Code Manifesto (2015):

1. **With great algorithmic powers come great responsibilities**
2. **Algorithms should serve humanity and the biosphere at large**
3. **The benefits and risks of algorithms should be distributed fairly**
4. **Algorithms should be flexible, adaptive and context-aware**
5. **Algorithms should help us expect the unexpected**
6. **Algorithmic data collection should be open and meaningful**
7. **Algorithms should be inspiring, playful and beautiful**

As a set of principles, the *BCM* is idealistic but its principles can be applied to, and revealed in, collective and individual artistic practice. For example, Principle 7 is illustrated in the exhibition *Data Landscapes* (2015), which was curated by Nicola Triscott herself. This exhibition explored the use of data and models of climate science within visual arts contexts.

How can these principles also be connected with the empowerment of citizens and their ability to steer the processes affecting them, such as those dealing with the Anthropocene and in the interconnection between the algorithmic world and our age? Nicola offered an example of a possible approach which uses some other principles of the *BCM*: the *Arctic Perspective Initiative (API)*.

[THE *API*: AN EMPOWERING INTERPLAY OF PEOPLE, ALGORITHMICS AND THE ENVIRONMENT]

The *API* is a non-profit, international group of individuals and organisations, founded by Marko Peljhan and Matthew Biederman, whose goal is to promote the creation of open authoring, communications and dissemination infrastructures for the circumpolar region in the northern hemisphere. Its aim is to work with, learn from and empower the northern and Arctic peoples through open-source technologies and applied education and training. By creating access to these technologies and promoting the creation of shared communications and data networks without costly overheads, it enables the continued and sustainable development of autonomous culture, traditional knowledge, science, technology and education opportunities for peoples in the northern and Arctic regions.

Arts Catalyst's collaboration with *API* offered the organisation a different perspective on the role of artists and curators. It revealed that traditional knowledge and skills can drive

change but are rarely recognised in the design and generation of algorithmic systems.

This project opened up the possibility of approaching other similar situations involving communities and the environment from the perspective of algorithmic systems and the *BCM*.

In an approach that replicates the collaboration with the *API*, Arts Catalyst have created several recent projects in the UK which follow as similar orientation. *Wrecked on the Intertidal Zone* (Arts Catalyst, 2014) is a series of cultural investigations into the Thames Estuary. It is a project done in collaboration with artists groups and independent artists YoHa, the Critical Art Ensemble, Andy Freeman and Fran Gallardo. This project explores the internationally important biodiversity and habitats of the River Thames and the traditions of its marine industries, which are rapidly declining.

The area and the project had to tackle issues such as flooding, declining species and health, which are all intertwined. The Thames Estuary is a place where the dimensions of large-scale global forces and the personal collide. During the project, new governmental schemes and corporate plans have been also part of the investigation.

Wrecked on the Intertidal Zone took place in a moment of growing environmental, social and political concerns for local communities – for example, it was clear from the outset that people had no say in or power over what was happening

and the impact of the London Gateway Port. It became evident that the project needed to involve those whose lives were directly affected by these changes. There is an ongoing disenfranchisement of people from the management of infrastructures related to where they live, and these structures are often centralised and run by both public and private organisations. The governance of key support systems has been taken out of the hands of people affected by them.

The project centered on local culture and opened up discussions on ecology, economics, infrastructure and health. It created an alternative archive consisting of films, exhibitions, online work and an eco-political recipe book, all achieved with ownership from the local community. These results give a perspective on the role of artistic practices, digital and algorithmic solutions in the empowerment of people that could otherwise have been lost along with any chance to steer the evolution and progress of the place in which they live.

Several other Arts Catalyst projects also show this methodology and spirit of reconstructing community power by enabling their abilities as steering agents and promoting the use of technology. One such project is *Test Sites*.

[**TEST SITES**]

Test Sites is Arts Catalyst's series of inquiries into environmental concerns such as flooding, pollution and species loss, and their impact on local culture and the health of ecosystems and communities.

At each site, Arts Catalysts is inviting local people and groups to be part of art-centered co-inquiries, working with artists, scientists and other experts. The project is a series of co-enquiries of local environments, stewardship and relationships with respect to health and wellbeing. It seeks solutions through the application of different skills, expertise and disciplinary perspectives – that is, an 'ecology of practices'.

All these projects are effective at a local level and create the basis for communities to regain an understanding and have a say in the development of their own environment, culture and future. However, the scale of the Anthropocene also challenges how we tackle issues that are much bigger and broader in scale. This era affects the planet as a whole and the multiple connections that spread beyond single communities.

'Planetary Commons' is a global framework of enquiry in the arts and humanities and we are failing to manage it, as the existing direction of regulatory systems seems inadequate.

There is an important relation between 'knowledge commons' and planetary commons. Artists and their uses of algorithms

can help to reveal and make others aware of the invisible processes at work. Art can contribute to technology and systems, and enable users to adapt them for their own uses, services, knowledge and culture.

[**REACTION BY JOANA MOLL AND RAMON SANGÜESA**]

Both Joana Moll and Ramon Sangüesa started by elaborating on the approach of Nicola on the interconnection of the local and the global, the algorithm and the biological and communities and environments.

Joana remarked that the approach by Arts Catalysts to complex systems could also be applied to artificial ecosystems created by humans. The most extreme example is the Internet: it has the greatest reach of anything humanity has ever built but is also invisible and has a huge environmental impact. Despite its huge ecosystemic nature, it is only accessible through interfaces. We know very little about its infrastructure, despite the fact that it allows our societies to exist in their myriad contemporary forms.

One aspect that Moll has worked with in respect to this 'hypersystem' is its connection with climate change. Her work *CO2GLE*, for example, is an artistic interpretation of the carbon footprint consumed when using the internet. CO2 generated to create the Internet is huge. This tends to be something that is overlooked and ignored, and we don't quantify it.

For Joana, this project it is an example of our limitations. In effect, while we are still able to understand physical systems which have an environmental impact, we struggle to understand systems based on data. They are therefore hard to measure because of their perceived non-materiality. A possible route of discovery is to devise new types of interfaces to start fighting climate change and the use of data, but we need to understand the tools we use in order to comprehend climate change.

Ramon Sangüesa felt that the communal and interdisciplinary approach of Arts Catalyst's projects had immense value in the leveraging and empowerment of communities. He referred to previous projects he had worked on which were devoted to the empowerment of communities with respect to technology.

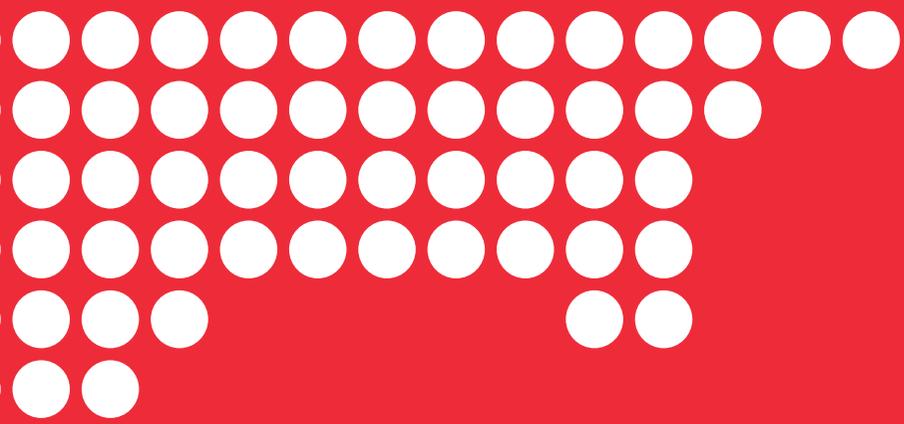
In a similar argument to Moll's, he remarked that very complex artificial systems are now in place which need to be understood and the control of which has to be regained by the people affected by them. However, he thought that there were some cultural categories that were colonising the thinking of disciplines such as art, design or activism.

The focus on 'problem solving' is now as pervasive as the use of data. There might be other ways to confront the increasingly complex, technological and algorithmic realities we are creating. The inherent problems are ever-present and the solving of one brings about another – perhaps it is more a matter of coping with a situation or rethinking it than finding an actual solution.

There is a political dimension in tackling systems we do not understand in spite of our deep relationship with them – how do we do this? A computer is an object that allows you to think alone and with others, while the use of data can help confront citizens with their needs, interests and expectations. Technology confronts problems that we are yet to discover. AI is a wealth of diverse systems which can come up with new knowledge. In that sense, the algorithmic culture can bring about new ways to explore these new realities.

Moreover, nature is not what it used to be; there is a strange hybrid on the horizon which is the result of interplay between the idea of genetic and algorithmic code and informational processes and infrastructures. All together, they impact on an increasing number of spheres, including what is traditionally understood as being 'nature'.

Nicola reiterated that her work in a contemporary art context is not about problem solving, but working with communities to frame 'matters of concern' (to reference French sociologist of science, Bruno Latour), to collect knowledge and to see where they might go with it, and identify and work towards a solution.



shift **ANTHROPOCENE**

**WHAT ARE THE ENVIRONMENTAL IMPACTS OF
THE CULTURAL AND MEDIA CONTENT AND DATA
GENERATION, STORAGE AND TRANSFER?**

Type of session:
Workshop

Facilitator:
Joana Moll

Focus:
**To explore and visualise the interrelationship of
data infrastructures and the environment.**

Questions:
**What is the relationship between the
algorithmic world and the natural world?**
How can we understand this relationship?
How can we raise awareness about it?

Joana ran a workshop focusing on the materiality of the algorithmic world and its implications for the environment.

She began by remarking that the main characteristic of our present socioeconomic system was what she identified as ‘cognitive’ or ‘network capitalism’. What might make the contemporary cultural environment different from other socio-economic arrangements is that wealth is no longer produced by fabricating material objects but by the exploration of social interactions and habits. These are very elusive, complex and dynamic sources of wealth to isolate, represent, visualise, quantify and understand. The sheer volume of infrastructure needed to do this, the volume of data generated and the speed that information is traveling and is transformed by the same system makes it an enormous task.

As an ecosystem entirely created by humans, the algorithmic world, and the Internet in particular, is massive. Technological devices make it possible for many different objects and processes to interconnect, whether these are informational or physical. In truth, we are really dependent on electronic devices but we know very little about the workings behind these interfaces as we use them. Most interfaces are graphical in contrast to the physical or textual interfaces of the past and they are lagging behind the sheer and evolving complexity of the Internet. For example, the ‘windows’ metaphor with the point-and-click interaction using mice and other devices is now a limited metaphor to understand the whole ecosystem that our devices inhabit.

The Cloud has become the dominant image conveying the ethereal, ever-changing nature of our technical informational infrastructure, known as the Internet. Our data, our information is ‘up in the Cloud’. In this bland perception of a mild, pacific and inoffensive ‘cloud’, the amount of work that is needed to build and maintain it, the struggles around power, energy, labour, exploitation and the strategic use of knowledge have – literally – evaporated.

So, the Internet – the largest and most complex system ever invented by humanity – is simplified because it is too massive to be fully understood. Its complexity – that is, its size, dynamism and interconnection) is equivalent to, or even beyond, the complexity of some natural systems. Maybe the first Internet implementations that emerged after the first nodes of the ARPANET could be understood but the Internet network infrastructure is now often underground and messy, with many miles of cables running under the ocean and through the earth. Just trying to explain how one message travels from one end of the network to the other end is virtually impossible. Certainly, you can describe how it works by the abstract explanation of the operation and interaction of the protocols that have been devised but, if you want to connect those different levels in a similar way as can be done in other disciplines, you are lost.

We should aspire to a better understanding of this ‘super-system’. For example, if we focus on the Internet infrastructure that connects continents, we have to understand how the undersea cable networks operate. With this being a physical

infrastructure we should also be able to understand its effects on the natural environment.

We have discovered that this undersea infrastructure has an effect on its immediate and remote environment – that is, undersea cables cause a lot of disturbance to habitats and have several deleterious effects that directly in the marine environment – cable networks are very noisy and disturb marine animals, for example. Power cables lose heat into seawater, causing environmental damage. A number of dolphin and whale deaths in recent years seem to be related to the effects of Internet infrastructure such as the seemingly isolated incidents of ‘beached’ whales being driven ashore and dying. It is suspected that the deaths of marine animals from these causes may be much more frequent than these beaching suggest. However, in accounts about such incidents, the Internet has hardly ever been mentioned.

[THE INTERNET, ITS DEVICES AND THEIR JOINT EFFECTS]

Aware of this connection between data infrastructure and the natural environment, Joana Moll started a line of research in 2017 on other aspects of the Internet and its potential effects on nature through pollution and other mechanisms.

The devices that we use to interact with the Internet are at the root of one of the most polluting industries. An iPhone

has more than 10,000 components, the production of which causes a lot of pollution. In addition, the devices have an effect on energy consumption: 80 per cent of the energy used is in the production phase, compared to only 20 per cent during its life of usage.

The effect does not end there; it is well known that people involved in the production of these technological tools are also directly exposed to their polluting effects. Workers in many phone assembly lines around the world, whether in China or developing countries, perform their tasks without any protective clothing while they assemble components that are known for their damaging effects on human health. This is on top of the poor working conditions which probably lead to depression and suicide in workers, as happened in the FoxCon factories in China, one of the main global producers of iPhone devices.

Around the factories and production centres that create the hardware for the Internet (whether for its infrastructure or for the devices accessing it), there are also environmental effects. It is known that many of the toxic substances associated with technological hardware – such as copper – end up polluting aquifers near the factories. This has bad consequences for the health of nearby populations of humans and animals and the effects of these factors are amplified by the cycles of life (such as the water cycle) which connect animals and plants.

Electronic waste ('e-waste') is also created in massive amounts, since consumerism and innovation impose such a rate of

change, that the average usage life of a phone is now 15 months, and that of a laptop three years. The e-waste produced is particularly rich in heavy and toxic metals and ends up in landfill sites or is re-sent as waste to third-party countries, often being disposed of in uncontrolled dumps in the Third World that, once more, have the effect of contaminating ground water.

[TRANSPORTATION]

The production of hardware (either for infrastructure or for access devices) needed to operate and interface with the Internet also has an effect on the flow of materials. Phones are designed in one country, produced in several others and then shipped back to the source country or all over the world. This involves another highly polluting industry: that of transportation.

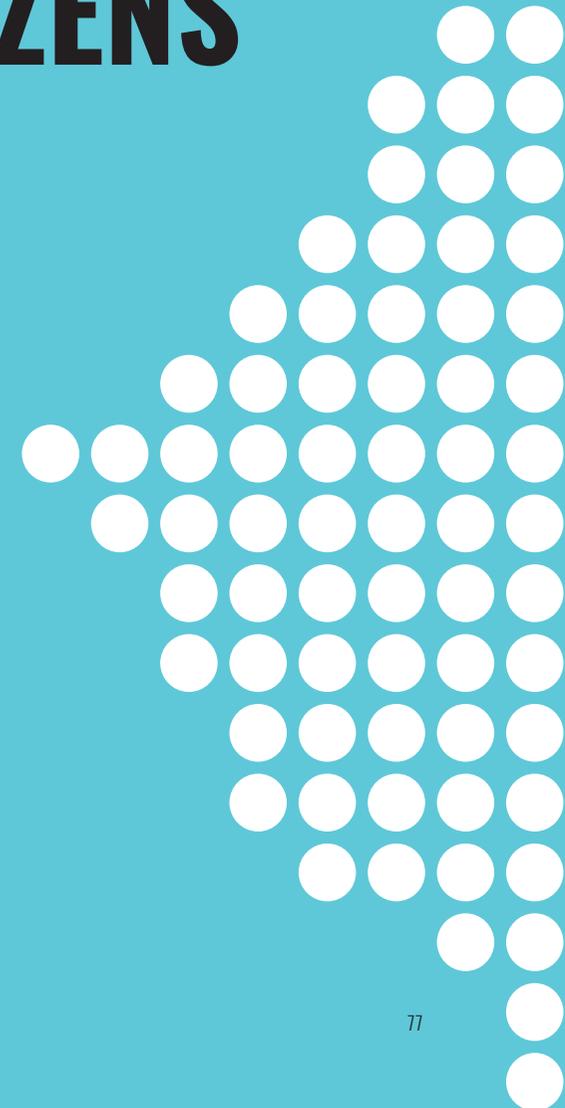
In fact, shipping is one of the most polluting industries. Because of the need to keep transportation costs low, the fuel used by freight ships is of the worst quality, throwing enormous amounts of arsenic into the air. It is estimated that the transportation industry directly causes the deaths of 60,000 people globally every year.

[THE POLLUTION OF THE 'NON-MATERIAL' DATA]

The interconnection of the production of information and the impact on the environment is not reduced to hardware production and transportation. The actual creation and storage of data is a massive source of pollution across the globe. It is estimated that each Megabyte of digital information is equivalent to 7.072 g of CO₂, while 3-4 Gigabytes produces a whopping 35.36 g of CO₂. About 40 per cent of the Internet's total carbon footprint may be attributed to the design of websites. According to recent studies, the Internet is responsible for two per cent of global CO₂ emissions, which is more than the contribution of the entire aviation industry. On average, the production of one kilowatt-hour (kWh) emits 544 g of CO₂, while it takes 13 kWh to transmit 1GB of information, the equivalent of 7.07 kg of CO₂. According to a study done by the American technology conglomerate Cisco, the estimated amount of annual global Internet data traffic in 2015 would have reached 966 Exabytes (EB) (equivalent to 1,037,234,601,984 GB) and was expected to reach 1,579.2 EB by the end of 2018.

Google.com is the most visited site on the Internet and 'weighs' nearly 2 MB. The site processes an approximate average of 47,000 requests every second, which represents an estimated 500 kg of CO₂ emissions per second. That is what Moll took as the starting point of *CO2GLE*, and the production of CO₂ by Google is constantly updated on the project's website.

shift CITIZENS



**AT THE SCALE OF INDIVIDUALS AND SOCIETIES,
WHAT CHANGES ARE OCCURRING BECAUSE
OF THE USE OF CODES AND ALGORITHMS?**

Type of session:
Workshop

Facilitator:
Ramón Sangüesa (Equipocafeina)

Focus:
To explore the concepts around artificial intelligence and how it conforms new views on citizenship and the political sphere.

Questions:
What is the relationship between AI and the current 'algorithmic world'?
How does this affect aspects of citizenship?

The idea of this session was to start by finding the main traits behind AI and then to explore how they affect our role as political individuals in our societies. The session began by speaking generally about AI.

An initial exercise involving all participants revealed common perceptions about AI., which included the following statements:

- **“Self-acting** by machine learning and self-deciding, based on harvesting information”
- **“Non-human thinking,** learning and decision making”
- **“Machines that can learn, reason or produce things for which they were not originally programmed”**
- “This question raises another: **what is intelligence?** AI is the intelligence of entities created by humans”
- “Another ‘new’ technology in the hands of humans; as always, for better and for worse – it depends on us”
- “1. The new wonder of the world; 2. **Perfect efficiency** of the autonomous and self-learning algorithm”
- “A network of cybernetic systems and applied communication systems”
- “The operation of commands, processes, decision-making, tangents and rationale”
- “Pure intellectual capacity, devoid of emotions”

The question of what AI really is has typically been connected with how we define intelligence. However, the session tried to disconnect itself from this discussion and focus on the rationale of power that exists behind AI and how it influences current social and political processes. AI was not created in a void; it has a history, and started at a given point in time by the impulse of a group of people with their own political beliefs and agendas. It is a brainchild of the 1950s that connects with the intellectual results and cultural atmosphere of the 1930s and 1940s.

The initial group of people that gathered at Dartmouth College, New Hampshire, USA, in 1956 for the Summer School on AI was male, white and from the true sciences, with some connections to economy and defence.

In order to see beyond the messy terminology surrounding AI that is now common in the mainstream media and public debate, and which is very much influenced by the agenda of bigger interests (whether from governments or the business sector), Ramon Sangüesa strived to find the minimum common description for what real AI does and to simplify its components and operation. In order to do so, he went back to the most direct attempt to create a discipline concerning autonomous and semi-autonomous machines: cybernetics.

Cybernetics was based on the ideas of **feedback** and **control**. It envisaged both machines and animals as objects that operated in an environment from which they received input

signals. These signals had to be compared to a set goal, while, if necessary, the machine applied a corrective action that was fed into that environment. In a very simplified form, this is how cybernetic control works.

AI started in a more fragmented way by trying to solve a set of problems in order to automate tasks that were considered intelligent, from solving mathematical theorems to being able to reason logically or automate the ability to learn. It was not until well into the 20th year of its beginnings as a discipline that an attempt to unify all these apparently unconnected endeavours under a single concept was made.

This emerged under the idea of the ‘rational agent’. This could be seen as a simplification or adaptation of the ‘rational agent’ used in economics to formalise the behaviour of individuals as economic agents. Connected to this came the notion of ‘bounded rationality’ – that is, the need of economic agents to act rationally within a limit set on resources (including time) available to make their decisions. Herbert Simon (one of the attendees of the original Dartmouth Conference and a Nobel Prize winner in economics) was instrumental in spreading this idea among the early AI community.

A **rational agent** – in a similar way to previous cybernetic entities – has a goal, operates in an environment from which it gets information and processes this information in order to decide what action to take next. In order to behave rationally, an agent has to select the action that will hopefully either make

it reach its goal or get closer to it. The way that this decision making is done can take many forms and have different representations, from logical descriptions and formulae to other non-symbolic forms. However, there are striking similarities with the previous formulation from cybernetics. In a way, AI is a new formulation of the cybernetic view on control processes.

So, AI is not magic, but a set of techniques that implement in different forms a rational agent operating through a cycle of feedback. Anyone can understand the rationale behind AI. The complexity of the system comes from the way it interprets the information, and the better the system is tweaked to respond to this information, the more intelligent it appears to be. Also, if it has a 'learning' algorithm, it can amplify its initial abilities to acquire new conceptual and operational knowledge. The first type of knowledge amplifies its views on what is part of its environment; the second on new ways to act in it.

With the worldwide distribution and use of various types of computers that are interconnected through communication networks today, AI has also become widely distributed, interconnected and all-pervasive. In a way, the algorithmic world can be seen as a massive interconnection of AI agents (or the AI implementation of the 'rational agent' concept).

In order to try to get to grips with this complexity, it is useful to use the lenses of cybernetics, feedback and rational agents when trying to understand how the different aspects of today's algorithmic technology fit together and how AI is working.

For example, the 'Internet of Things' can be seen as the set of sensors and effectors bringing in information about the environment where AI systems operate, and acting back on and delivering actions into this environment that have been decided by another part of a distributed AI. Similarly, all Big Data technologies are also data-gathering technologies from environments where AI operates. The analysis techniques used on Big Data to extract new insights about the environment are most of the time machine-learning techniques, reconnected with a more or less complex AI system.

[MACHINE LEARNING IS PARTICULARLY RELEVANT]

We are at a moment in time when ML is probably the most widespread AI technology, and it operates at very different levels, from sensors in 'Smart Cities' to systems harvesting information from social media, to the control of simple household appliances.

ML tries to abstract and generalise information so that an AI system which uses this learning is able to operate in more settings and situations within the environment in which it was initially designed to operate. This is the key to providing some level of autonomy in AI systems, autonomy being a characteristic of 'intelligent agents' that repeatedly comes up in any characterisation of AI.

The techniques of ML come with an aura of obscure complexity, of specialised knowledge or difficulty in understanding that turns them into the private playground of very specialised individuals. While this is the case in the day-to-day development and application of these techniques, it is not impossible for laypeople to grasp their basics and to start to understand the implications.

Very broadly, ML techniques can be divided into three main groups. Two of them aim at finding more general descriptions of the environment an agent operates in, while the third tries to find ways to improve the performance of the agent itself (in terms of time, for example).

When a system has little or no knowledge with which to confront a new domain of application, the first type of ML algorithms tries to identify the regularities that exist in the domain (pattern recognition), which sometimes involve the finding of groups of very similar things that are different to other such groups. ‘Clustering’ methods fall into this family of ML techniques. An older example could be the *The Clustering of America* project which divided the country by zip code and characterised different categories of districts in terms of the cultural and consumer traits of individuals in those areas. Of course, at the time it was done with techniques that were more statistical than AI-based, but it set a trend for the automatization of this type of learning.

When the structure of the domain is already known (for example, which classes of consumer or voter are out there,

and how many there are), then ‘classification’ tries to come up with the minimum set of questions about the characteristics of individuals that could help locate a person in a given class. For example, classifying a user of social media as a ‘progressive’ or ‘conservative’ voter, or as a person that can be trusted with credit. In a way, this process could be assimilated into learning to predict with maximum probability the class to which an individual, event or object belongs.

The online ecosystem where ML operates is increasingly complex. For example, systems working online are constantly interchanging their models of classification; a study looking at where personal data is sent discovered that a typical free app for Android phones distributes data to 500 websites every 200 milliseconds.

Of course, all these methods are prone to errors depending on the type and quality of the data the system is accessing to. They can have very dire consequences for individuals, inducing social exclusion and discrimination, and may replicate biases, as many authors (most notably Cathy O’Neil and Ben Eubanks) have described.

[AI AND INDIVIDUAL CITIZENS: ARE CITIZENS RATIONAL AGENTS OR DATA POINTS?]

The fact AI systems, through Big Data and ML, are continuously operating both online and offline, has consequences for

individuals at many levels. The first is the role AI and ML systems have in the homogenisation of personal identities. The ‘like economy’ can be seen as an addictive feedback loop system that instills a particular way for individuals to present themselves in society and to adapt to the expectations of others. These are well-known mechanisms of identity formation that predate technology and social media; they combine our own projection with the reflection of the views of others. This is nothing new in terms of our understanding of identity construction processes and social adaptations, but the scale, speed and the fact that automatised steers and controls this process in part, is new.

As citizens become producers of data as they express their behaviours and opinions online, they become the input part of a gigantic feedback loop feeding a myriad of AI systems. ML algorithms are permanently clustering and classifying individuals. They are prepared with datasets about people (though not necessarily the same people to be later classified), and the selection of this data can be involuntarily biased against a group and the ML system will amplify this bias. Discrimination, exclusion and unfair treatment of individuals and groups are frequent now and are directly affecting the rights of citizens, including their ability to participate in political debate or to make choices without being influenced by algorithms. This influence is operating on a level that has not been seen in previous political propaganda technologies.

At the level of collective organisation, the ideas behind AI are also making headway. The concept behind the feedback loop of AI, with its inherent connection with ideas of control and optimisation, has made inroads into political organisation ‘governed’ by AI and, in general, into the use of technological metaphors and the means to organise public life.

Proposals abound, either from researchers or from governments, that see citizens as mere data points for AI systems that will ‘manage’ societies.

There are many systems in operation which put AI to work in controlling behaviour and establishing the norm for the ‘correct citizen’. The social credit system in China is always shown as an example but, as mentioned before, commercial actions also slowly make people conform to a stereotypical perfect citizen-as-consumer type.

Other systems – either proposed or already in operation – make use of the ideas behind cybernetics and AI to create unprecedented levels of automation in the administration of societies. This also has consequences on the reconfiguration of what a citizen is or who is entitled to be a citizen of a given state. Estonia is frequently cited as an example of this approach to data-based and automated management, not just of the ‘administrative self’ of its citizens but in many other areas. In fact, the concept of Estonian e-citizens (non-Estonian nationals who can have certain rights in the country if they register through an algorithmic system) questions some traditional aspects of citizenship and territoriality.

‘Liquid democracy’ is based on the idea that some issues affecting a society cannot be voted on by anyone but by experts. So, laypeople can delegate their vote on a given issue to an expert of their choice. Several discussions are currently going on about how AI could ‘recommend’ which expert to contact about a particular issue. There are even proposals to actually create ‘artificial experts’ that, through ML, become very proficient on an issue and vote for you.

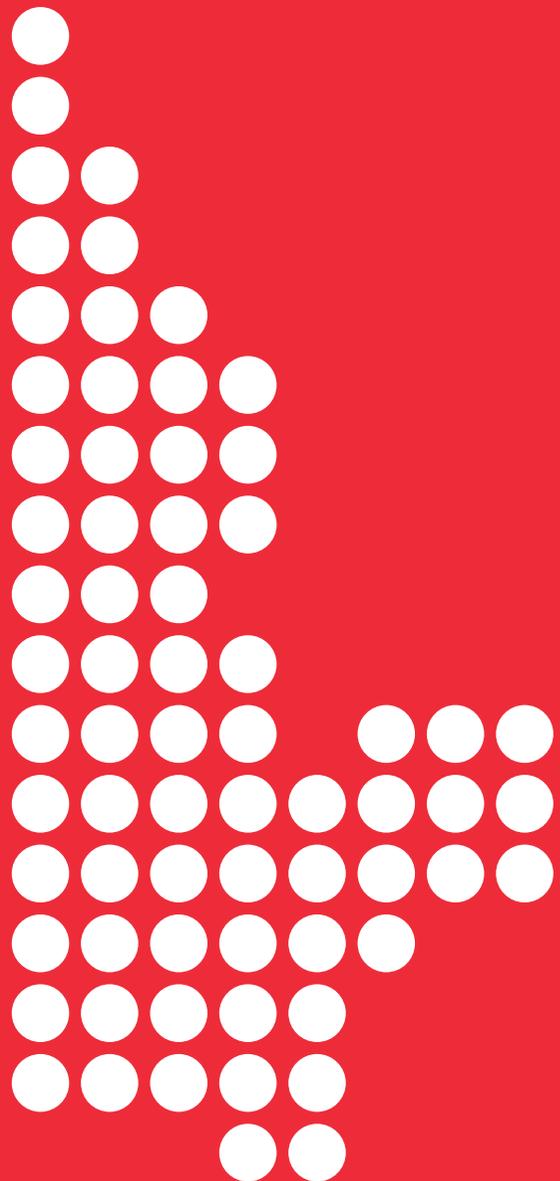
Much of this makes people feel uneasy about the intersection between AI, politics and citizenship. There are organised groups that try to counteract the control and discrimination powers towards which AI is working. Artists have also contributed to this discussion. For example, in this same edition of *Beyond The Obvious 2018*, Manuel Beltrán is presenting projects which are essentially a denunciation of the exploitative consequences of the predominance of ‘intelligent control’. Activists and hackers are also very creative in the use of technology to expose and counteract the abuse of automated and intelligent techniques in exploiting of personal data (see, for example, AdNauseam as a practical tool to expose the abuses of online advertising).

There are groups of researchers working in technologies to revert discriminative behaviours in ML algorithms (fatml.org), and associations working at the intersection of personal freedom, personal data and its treatment by information processing systems, including AI systems (mydata.org). Projects at the European level are working hard to provide technical infrastructures and sets of guidelines to ensure

that personal data is always under the control of individuals (decode.org). Finally, there are many initiatives linking ethical guidelines for the development of AI systems that will also influence the use of these systems in the political arena.

So, although the main feeling of people in general – an attendees at *BitO 2018* in particular – could be a little pessimistic, there are possibilities for the arts working with technologists, researchers in the social sciences and political actors to devise and promote a type of AI where its founding concept of feedback and control is put to other uses or sidestepped.

We have a dominant culture that sees citizens as a series of datasets that are more or less predictable and can be controlled. It is up to us, as individuals, to decide if we want to counteract this culture. There is nothing final about AI and its relationship with citizens.



ctrl+shift **POLICY**

THE TYRANNY OF ALGORITHMS? DESIGNING HUMAN-CENTRIC AI

Type of session:
Keynote and debate

Speaker:
Bruno Lepri
(Fondazione Bruno Kessler / Data-Pop Alliance)

Focus:
This session focused on the opportunities of the algorithmic world – and more specifically ML and data-science techniques – to deliver positive interventions for the benefit of society. The debate centered about the interplay of culture with science, technology and politics.

Moderator:
Robert Manchin (Culture Action Europe)

Reaction/Debate:
Jutta Thielen-del Pozo
(Joint European Research Center)

Carmen Croitoru
(National Institute for Cultural Research and Training)

Pedro Velazquez (Creative Europe Unit)

Julie Ward (MEP, European Parliament)

Questions:
How can the positive potential of the algorithmic process to contribute to the common good be showcased?
What might data-driven societies be like?
How can we create an algorithmic complex at the service of society?
How can we create a people-centric AI?
What are the possible methods we can use to collaboratively create these new possibilities?

Bruno Lepri started this keynote session by expressing his feeling that algorithmic technologies – and specifically those associated with the intelligent treatment of data – had been portrayed in earlier sessions at *Beyond The Obvious 2018* as something dangerous or negative. While acknowledging the bad uses that these technologies have been put to, Lepri shared his firm belief with the audience that these smart technologies can be used for the benefit of individuals and society in general. He based this belief on his experience developing systems that aim to deliver a positive result in a number of settings.

Bruno started by noting that we leave a trail of ‘digital breadcrumbs’ whenever and wherever we come into contact with the algorithmic infrastructure. The exponential growth in streams of data reflecting real world situations and human behaviours – including call detail records (CDRs), social media data (from Twitter, Facebook and others), traffic, spending, government and satellite data, and even other sources – provides opportunities for carrying out new research and to deal with fundamental problems such as urban planning, healthy living, epidemic prediction, crime prediction, emergency response planning and the understanding of social dynamics. He wanted to stress the opportunities that are possible when research on these digital trails is done from the perspective of contributing to society in a positive way. Bruno shared the vision of a ‘data-driven society’ focused on the common good.

He went on to show how the availability of these new sources of data in recent times has shown new ways to provide less

obvious social indicators beyond the usual ones, which are otherwise typically managed by governments for statistical and prediction purposes. For example, he described a project that used data from the communication infrastructure to predict economic development in different areas. From the analysis of the data, there seemed to be a clear correlation between places with more social and network diversity and better prospects for economic development. A similar set of data might be used to predict what affects the financial well-being of individuals.

Urban environments are complex and the ‘health’ of city life depends on many factors. Bruno explained how his research group approached the problem of safety by connecting it with the architectural qualities of urban spaces: the types of buildings and their characteristics in terms of visibility and the existence of ‘blind spots’. They did this by analysing many diverse sources of images, such as those on Google Street View. This was also connected to the type, level and distribution of crimes in cities.

In brief, the characteristics of urban spaces are naturally connected to ‘natural surveillance’ conditions – that is, those aspects of the urban environment that act as deterrents for criminal behaviour. Mobile and communication data also revealed that a lower incidence of crime was connected with the indicators of a ‘sense of community’ that existed in an area. This, in turn, was related to the patterns and level of interactions between citizens.

The research was tested in different cities in order to see if there were variations between different urban settings and socio-economic and cultural factors. Boston, Bogotá, LA and Chicago were the cities studied and it turned out that there were different types and patterns of crime in cities that were connected with the way neighborhoods were inhabited or used by people. In other words, the data indicated that place matters. It also showed that the predictive capability of these new sources of data and the ‘intelligent technologies’ using that data could be another tool for informing policy.

Other interesting applications of this approach on similar data sources established a relationship between the flow of ideas between people and their risk of being unemployed.

The project tried to help governments understand the differences between the people who find a new job quickly and those who don't. Through analysis of the different patterns of communication between people, those with more diverse networks and more interactions had a lower risk of becoming unemployed (a possible explanation of this could be connected with the seminal sociological findings in Granovetter, 1983). That also pointed to the fact that unemployed people were cut off from access to more diverse networks and interactions because the cost to connect to a mobile network was either already high or became too high for them. Online segregation sometimes seems to have more severe socio-economic effects than physical segregation.

The network characterisation of the relationship between people, their communication and their behaviours seemed to be a predominant set of factors that had an influence on many types of problems.

A similar approach helped find ways to improve the health conditions of Syrian refugees in Turkey. By exploring the relationship between diseases, the onset of epidemics and the degree of segregation of refugees in spatial terms, Bruno's team made clear that, by allowing refugees to settle in heterogeneous places, the risk to their health and that of the community in which they were living was eliminated.

These types of methodologies were used also in the United Nations Project *Data Revolution*, which tries to establish a way of using big data to evaluate the indicators of different Sustainable Development Goals. Again, instead of resorting to the usual sources of data and statistics used by governments, Bruno and his collaborators were using data that can be gathered from communication infrastructures and phone usage as indicators.

In summary, new Big Data methods can be used to explore new possible policies for the common good.

[SHADOWS ON THE DATA-DRIVEN SOCIETY]

However, Bruno Lepri recognised that there is a real menace in the misuse of these data. Furthermore, he proposed exploring what he called ‘the tyranny of algorithms’, paraphrasing the title of a book that denounced how international experts behaved with respect to the control of World Bank policies in Third World countries (Easterley, 2014). In a paper, he co-authored (Lepri et al, 2017), he anticipated some of the problems that besieged this type of data science.

To start with, there is a real danger of violating the privacy of individuals when using these datasets. It is well known that by analysing mobile data that shows the location of a mobile phone, it is very easy to identify unique individual trajectories; this is possible with just three triangulation points of localised data, this is possible. This doesn’t mean that the person is positively identified, but that the trajectory of a particular individual can be completely tracked. By crossing these data with other information it is, in principle, possible to actually correlate the name of an identified person to that trajectory.

Mihal Kosinski (before he became known for the use of his research by Cambridge Analytica) was able to produce a method that inferred the five main personality traits used to classify people in psychology from the analysis of the posts that people published in Facebook (whether in text or image form).

The use of this data opens up the opportunity for a wide range of discriminations, either by the way the data to train algorithms is selected or the way these algorithms are themselves chosen, people can be the object of a decision that might affect their rights and access to work, finance and culture, and their life as political agents in society.

Bruno remarked that there is a problem with the lack of transparency by which all these algorithms operate. It is difficult to know how they work or who decided to design them that way and so, it is extraordinarily difficult to hold the responsible people accountable.

In Bruno’s opinion, the way to fight the tyranny of algorithms is to provide user-centric data ownership, make algorithms transparent and accountable, and create new methods to experiment with data-driven policies before they are applied.

However, these mechanisms are not easy to implement or to be accepted. For example, if data ownership is understood as something that implies some kind of remuneration for your personal data, then the experiments led by Bruno’s group hint at a fundamental difficulty. They created a market for personal data and invited the subjects of their study to give a possible value to their data. The result was that, on average, people put a price of €2 on each of their personal pieces of data (that is, their addresses, ages and other items). Clearly, the current business model of the Internet is not sustainable if each company has to pay what the people think they should.

Based on these results and other information, there are projects that try to create data markets which preserve personal privacy. The OPAL project is an example of such approach. It is a multi-partner effort led by Orange, the MIT Media Lab, Data-Pop Alliance, Imperial College (London) and the World Economic Forum, which aims to open data collected and stored by private companies without exposing it by ‘sending the code to the data’, rather than the other way around. OPAL’s core consists of an open platform allowing open algorithms to run on the servers of partner companies behind their firewalls to extract key development indicators and operational data of relevance for a wide range of potential users. Requests for approved, certified and pre-determined indicators by third parties – for example, mobility matrices, poverty maps and population densities – are sent to them via the platform; certified algorithms run on the data in a multiple privacy-preserving manner, and results are made available via an API.

For Bruno, this is a possible example of a human-centric, privacy-preserving way of managing personal data, but there is still the fact that current AI systems are very primitive in their current formulation and cannot cope with social and collective intelligence. This calls for a different approach to AI, an approach which recognises the complexity of the relationship between algorithms and humans. There is a need to construct this sphere in a different way by effectively creating complex mixed human and AI ‘ecologies’. In this approach, the benefits of policies created from data science and AI efforts have an opportunity to be realised. The methods for working

out this new more complex vision are still in their infancy but the ‘living lab’ approach, which engages prospective users of a technology in the design and development of this same technology, might be one way to go.

This presentation was followed by a debate where different aspects of the collaboration between the arts and sciences were explored from different perspectives: from the research management position with effective outreach and joint investigation programs (Jutta Thielen of the Joint Research Centre), from cultural policy and research (Carmen Croitoru of the National Institute of Romania), from the policy-making perspective of the EU Commission (Pedro Velazquez) and from the point of view of the EU Parliament (Julie Ward, MEP).

**JUTTA THIELEN-DEL POZO
(JOINT RESEARCH CENTRE):
COMMUNICATING THROUGH INTERDISCIPLINARY COLLABORATION
BETWEEN THE ARTS AND SCIENCES**

Jutta Thielen-del Pozo started by remarking on the importance of science with respect to policy making and its contribution to creating a better society. She emphasised the importance of data and scientific knowledge as a way to produce better policies, particularly for science. She said that getting scientific policies right was essential for the wellbeing of all citizens, especially in an increasingly globalised world and pointed out that behind policies, there are everyday issues that affect the lives of millions of citizens, such as the quality of the water they can access or the manipulation of the information they receive.

However, data, science and policies are encoded into legal texts that people can only influence indirectly through voting. Jutta's opinion was that there should be a better way to communicate with citizens and to effectively engage them in the discussion of policies, a discussion that can be informed by data and by scientific knowledge.

She remarked that there was a way to connect policies with citizens by resorting to transdisciplinary work between scientists, artists and policy makers. It is through such collaboration that issues can be opened up to the public and a debate can start, enabling people to take a more active role in the creation of policies. The arts can provide a stimulating environment for science and also offer context and a different perspective on the world for both scientists and wider audiences.

CARMEN CROITORU
(NATIONAL INSTITUTE OF ROMANIA)
APPLYING DATA-CENTRIC ANALYSIS TO
UNDERSTAND THE CULTURAL SECTOR

As an example, she cited projects such as the Resonances II exhibition FAIR/FEAR, which involved an exploration of the concepts of fairness and fear towards immigrants. With the collaboration of artists, a very moving and powerful installation was created, in which visitors to the exhibition were invited to place themselves inside a cage in order to empathise with the situations of migrants and the existence of barriers towards them that are often inspired by fear. Visitors had the possibility to engage and participate; they contributed their insights, concerns and expectations, and interacted with the installations, volunteering randomised data for further research on fairness. In that way, the exhibition started with knowledge from the social sciences about migration, fairness and fear, created an intense experience for the public and produced new data for research.

Other example was Frederik de Wilde's *The HyperThinker* – a work oriented towards the exploration of current feelings of paranoia around the development of information technology. Through the exhibition – curated by the European Commission's Joint Research Centre and entitled *What makes a fair society?* – de Wilde gives a new reflection on Rodin's famous sculpture *The Thinker*, and asks what would the Thinker be contemplating today, in the light of the successes of technology on the one hand, and its challenges and risks on the other.

Explaining that there are no simple solutions to complex problems is one of the biggest challenges of both scientists and policy makers today. More than ever before, scientists must be experts, open minded and capable of looking beyond the obvious, to find innovative solutions and answers to problems that concern us all, Jutta concluded.

Carmen Croitoru presented the work of Culture Data in Romania (www.culturadata.ro) on two related subjects. One was their new data-oriented approach to investigating phenomena, *Data Science*, and the other was an assessment of the cultural sector. She made the case that the new algorithmic and data tools represent a new way to demonstrate value and impact in that sector.

She argued that access to new sources of data, the availability of public sources of data and other databases and data streams that are open and in some way connected to cultural activities is an opportunity for the cultural sector to know itself better and to be open to the monitoring and evaluation of its activities. This way, the cultural sector can meet criticism with rapid proof of its impact.

She recognised that this is a much-discussed question; that is, which factors can be quantified to evaluate the social and economic impact of culture. This certainly remains a matter of debate, with some even questioning that such measurements make any sense at all. Instead of adding to this controversy, Carmen wanted to share with the audience of *Beyond the Obvious 2018* how gathering data from the culture sector could be performed and seen as something valuable in itself. She also wanted to share what was gained through the experience of

her institute in applying a ‘data science’ approach to research questions about culture in Romania, and did so in the spirit of collaboration within the cultural sectors and specifically with the *Beyond the Obvious 2018* community.

She explained the approach that they followed at Culture Data Romania (CDR) to get an initial comprehensive understanding of the importance of the cultural sector in the country and its constituent parts. The CDR felt this could be a first step to further develop relevant indicators of the social impact of culture. DCR began by gathering information about the country’s libraries, theatres, museums, public collections and cultural establishments. They then created an interactive interface using the resulting database. This enormous effort gave immediate glimpses of the characteristics and inequalities present in the sector. For example, by doing a regional analysis it was clear that there was a lack of particular types of cultural establishment in certain areas in Romania. The results are now open and can be consulted under different criteria, such as year, region, type of activity and institution.

Carmen remarked that the system is seen now as a set of tools to help authorities in developing cultural policies, and that it is the first important step to foster a ‘data culture’ in the administration and the sector itself.

Of course, as happens with many data gathering and visualisation projects, it is important to know what has been left out. For example, many aspects of culture which correspond to

communities, independent artists and to activities that happen outside the institutions represented in the database are not included in the project. However, merely by having the current database, it can be used precisely to show what is still missing from the map. The public took this development as a token of a more general tendency that goes beyond Romania: the question of how we measure and support community initiatives without public support.

PEDRO VELAZQUEZ
(EU COMMISSION)
CREATIVE EUROPE PROGRAMS AND CULTURE

Pedro Velazquez's intervention focused on explaining how the Creative Europe Unit (CEU) sees the relationship of its programmes with the main interests of the community assembled around *Beyond the Obvious 2018*.

He remarked that there was an understanding in his unit of the value of culture, which should now be seen as transdisciplinary and interconnected; that is, a culture that overlaps the visions of the traditional arts and sciences and which operates on both local and global issues.

He said that the CEU has been working towards making this vision of an interconnected culture possible and was modulating current methods and programs to help its development. He described how all the programs in the CEU would be invited to have a cultural Budget, a window for which was opened, and that the part of projects connected with culture would be considered as separate from the rest of the project budget. In his opinion, this showed that culture was here to stay and that the financial support for it within the program was effectively secured. He remained open to showing more details of these mechanisms to the *Beyond the Obvious* community.

JULIE WARD (MEP)
THE ROLE AND VALUE OF CULTURE FOR THE FUTURE

Julie Ward began by declaring that she was completely convinced that culture is absolutely fundamental in shaping the future. For her, the value of culture goes beyond any economic argument; that is, culture has a value by itself, although this idea has been under siege for too many years and the purely economic valuation of almost everything under neoliberalism has gained much ground.

Being so essential to society, culture should receive explicit support and the policies to help sustain it.

She remarked that this also implied that the existence of a clear intention to work for making culture accessible to all. She mentioned as an example the need to consider how we can make efforts towards inclusivity – meaning that a common approach to improving access with the aid of algorithmic resources or Information and communication technologies in general should take into account, for example, people with disabilities.

However, policies should not only focus on the beneficiaries of culture or insist on facilitating access. Culture emerges from the joint work of many participants: cultural institutions are very important and play a huge role in the cultural sector but policies should work for individual artists and other small players – such as independently-run cultural facilities and community projects – as well.

Culture should be recognised as a right, in terms of freedom of creation. Policies should work to ensure that freedom of creation remains a value in itself. She remarked that this was fundamental and connected it with the promotion of cultural dialogue in a world which seems to be becoming more fragmented, insular and prejudiced.

She recognised that digitisation should be seen as an opportunity and that culture should place itself right at the heart of the digital revolution.

MULTIPLE XITY

Type of session:
Presentation and panel discussion

Focus:
The MultipleXity initiative within the Timisoara European Capital of Culture, institutions, communities and 'extitutions'

Participants:
Dan Bugariu (MultipleXity),
Chris Bruckmayr (Arts Electronica)
Tere Badia (Culture Action Europe and Hangar)

Moderator:
Chris Torch (Intercult)

Questions:
What are the key points in the relationship between iconic projects and culture in cities?

What are the main hurdles and problems of similar projects in other cities?

How were these problems solved?

How can the development of MultipleXity be steered to come up with an effective, fruitful and sustainable contribution to the city?

MultipleXity is an initiative in the city of Timisoara, Romania, which was included in their European Capital of Culture (ECoC) 2021 bid to build, renovate and, in some ways, form a combined centre for science, art and innovation. This is not to destroy the ecosystem of other initiatives in the city, but to act as a driving force and connecting point for them.

The investment for this project is very large for a city like Timisoara, and MultipleXity is in its early stages of development. The ECoC aims to do something which has not been done before and to ask citizens to imagine what has not yet been imagined.

The session revolved around this project and the contributions of cultural agents with a strong connection to their respective cities. They shared their views, opinions and experiences on the interplay between culture and cities, in order to promulgate the Timisoara *MultipleXity* project.

**[CHRIS BRUCKMAYR (ARS ELECTRONICA)
THE EXPERIENCE OF ARS ELECTRONICA: FROM THE FRINGE
TO BECOMING AN INSTITUTION]**

Chris Bruckmayr is an artist, musician and all-round creator involved in the development and management of Ars Electronica (AE), and as part of the AE 'tribe' he presented his views on the evolution of this initiative.

AE developed out of the ‘free art’ scene in Linz, Austria, starting in 1979 with a small group of people interested in the looming digital age. It began as a platform and festival for people interested in computer science and media arts to come together. The early iterations of the festival used any available space in the city to create public artworks – in main squares, churches and riverside parks.

The festival grew over time and eventually acquired a building from the city; they then had to deal with the fact that the building needed funding. In 2009, Linz became the ECoC, and this led to the construction of the new Ars Electronica building that audiences are familiar with today. Their board includes CEOs, politicians and many different stakeholders.

Building something like a large gallery can alienate the free scene and local community that were involved from the beginning, and that community is the most important source of talent and energy. When considering plans for *MultipleXity*, in Bruckmayr’s view the team needed to consult and integrate members of the whole arts community into the planning of the institution. Also, the resulting design should be kept open to the vitality of the city itself and of its different urban spaces. For AE 2020, Chris proposed that the festival went back to the street and that it should widen the curatorial remit to bring the community into the festival in a bigger way. Chris expressed mixed feelings about the idea of permanent exhibitions or collections, because they must constantly be reviewed: technologies age so fast and societies change so

rapidly that exhibitions can quickly feel outdated or static in a shifting world.

The panel asked about the function of the festival in developing AE as a permanent space (with particular reference to the role of Timisoara 2021 in developing *MultipleXity*), and Chris commented that the massive network of artists created through AE led to a desire to represent them in a more permanent way. The panel then moved on to discussing the role of the ECoC opportunity in developing arts in Linz. He commented that becoming the ECoC increased public visibility for culture, taking the arts out of the shadows and turning them into an institution. It opened economic channels for arts in the city and, for AE, increased awareness and enabled cross-sector collaborations. Since then, larger companies have approached them to discuss the possibility of interfaces with commercial technology – for example, recognising the innovation and expertise of the AE artists and team.

The festival does a lot for young people with its focus on experimentation. Chris noted that they are freer to do things with fewer quality judgements on results when the activity is viewed to be community-led, which encourages further experimentation. AE is ultimately all about the artistic vision of society.

**[TERE BADIA (CAE AND HANGAR):
THE EXPERIENCE OF HANGAR, BARCELONA:
'EXTITUTIONALLY' OCCUPYING THE WORDS]**

Tere Badia began by showing a video of the Hangar space, introducing the initiative's approach as a triangulation balancing city policy, the inhabitants of Hangar and the communities surrounding the building.

Up until 1992, Barcelona used a combination of cultural strategies and urban regeneration as its main strategy for growing and promoting big events, the most global being the 1992 Olympic Games. This became known as the 'Barcelona Model' – great for the image of the city, but not good for its grass roots artistic community. It increased the cost of living and drove artists further and further out of the city. Hangar came from a real need to provide studio spaces for artists who were losing their workspaces because of newer city policies.

In 1996, Hangar was offered an old textile factory in the middle of an industrial neighborhood, after being inspired by other models of artist-run spaces. This was the key to organising the governing structure of the association, which had more than 800 artists behind it. Subsequent aggressive policy interventions by the city had an impact on the neighborhood Hangar was situated in and many small businesses were evicted from the area, including a number of artists.

The last influence on the creation of the Hangar space was the Declaration of the Barcelona 15-M Camp Culture Commission (named after the anti-austerity demonstrations in Spain on 15 May 2011 by the Indignados movement – probably the most direct immediate predecessor of other movements such as Occupy). This was an important process to redefine the role of cultural policies, and it supported intangible cultural practices and the importance of the idea of art as a 'common asset', encouraging experimentation and knowledge.

From its very beginnings, Hangar was formed not just as a collectively-managed centre, but also as an institution of resource. The project places importance on the role of artists as researchers and the merging of different disciplines. Referring back to earlier discussions in the conference on the idea of 'occupying the words', Hangar occupied the words 'research' and 'centre' when it defined itself as an actual research centre; in fact, Tere Badia would prefer to refer to Hangar, not as an institution but as an 'extitution', given its dense network of connections in and out of the city with numerous very different participants. Another word they are beginning to 'occupy' is 'interface' – the idea of thinking of Hangar, not as a permanent physical institution but as an access point for artists and communities, further affirming its status as an extitution.

Inspired by these two interventions, a question was raised regarding the dangers of iconicism and an inventory of the needs of *MultipleXity* was requested.

[DAN BUGARIU EXPLAINS THE TIMISOARA 2021 [VISION AND MULTIPLEXITY]

Dan Bugariu, has more than 20 years' digital technological experience and presented himself as the 'pulse-taker' of the creative sector. He contributed to *MultipleXity* as part of the Timisoara ECoC 2021 project and the 'Bright City' concept. To frame the goals and processes of *MultipleXity*, he started by setting out the context of Timisoara 2021, which is essentially built around the principles of Agenda 21 for culture and works as a cultural strategy; he created the 'bid book' for the capital, containing all the specific details needed to cover the financing for the bid.

The five principles of Timisoara 2021 are:

- **Openness**
- **Participation**
- **Responsibility**
- **Innovation**
- **Connection**

This vision of Timisoara 2021 revolves around the motto: 'Shine your light, light up your city'. The program thinks about the city as the sum of its residents and, on a grander scale, as the 'house of their houses'. The vision of *MultipleXity* is that our light makes our city better; the program aims to shine a light on curiosity, courage and 'cre-action' in the city.

MultipleXity is the main legacy of the 2021 bid and aims to be a cultural landmark for the city. Perhaps the first concern is whether the landmark will be sustainable and the team wants to achieve this by making the project a catalyst for the community. The question remains about the form in which *MultipleXity* will take shape. Will it be one space or a network? The panel further questioned how the team could align ECoC to *MultipleXity* and asked if they could test ideas during its development, and temporarily reinvent or reanimate the former industrial sites and buildings that are so numerous in the city.

The panel expressed its concern about building a space too rapidly and was pleased at the idea of using smaller spaces for shorter periods of time as the development progresses, which may not lead to the completion of *MultipleXity* until somewhat later on.

Dan went on to highlight the main traits of *Multiplexity* by posing and answering several crucial questions. The main idea for the Project was to provide space for the performance of multidisciplinary experiments. There would be also room for interactive exhibitions and hands-on laboratories but these elements should be completed by the realisation of experimental events.

The second question that Dan tried to answer was about the quality of the creative work that will take place in *MultipleXity*.

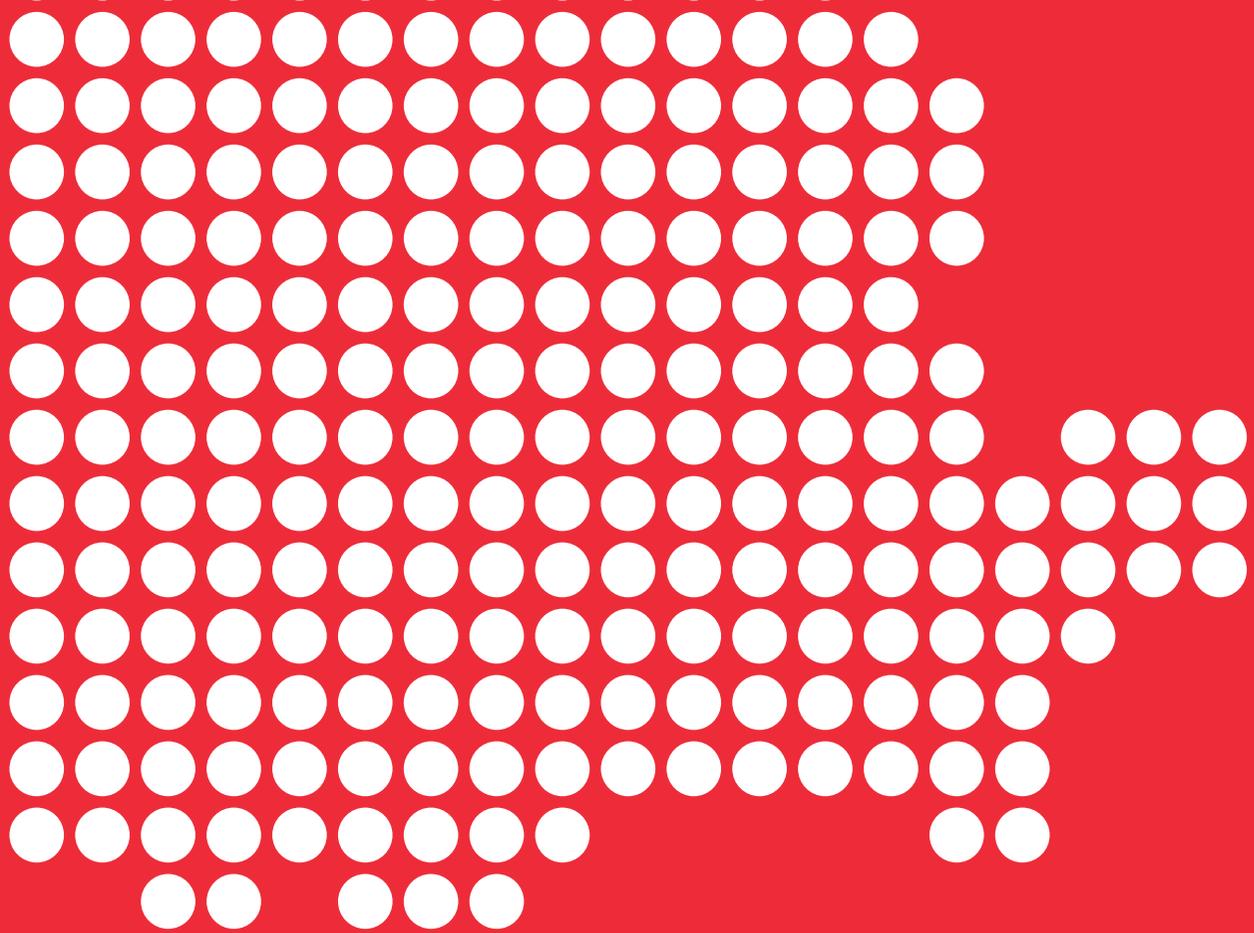
The idea is that everyone should be a creator in the space. Content created for the space should be accessible to a wide range of people for it to be able to evolve with society. The things that will happen in *MultipleXity* should be in tune with this idea, deferring to the different types of knowledge and disciplines required, and not just a combination of arts and sciences.

To reach this functional level, Dan thought that the type of contents and innovation that will take place in *MultipleXity* should take advantage of community crowdsourcing processes. In that sense, the ‘Brighter City’ aims to create a system to corral resources to move in one direction and enable co-operation between the providers of resources and stakeholders.

In the concluding comments, Chris Torch asked for two or three concrete proposals for this period of development. Tere suggested that this sort of project must be situated in one place and that a set model would not apply across all projects; it would be necessary to work ideas through with the community. She remarked that we can all be creative, but we cannot all be creators; it takes hard work to move forward and to be an artist. It is very important to be inclusive, but *MultipleXity* must recognise the role of the artists. Finally, she observed that *MultipleXity* should not be considered as a combination of the separate disciplines the arts, science and technologies, but as series of city labs co-designing and performing open science and open arts.

Chris suggested throwing a big party (that is, a temporary event) in potential locations for all those interested in Timisoara 2021 – not just the artists and stakeholders, but kids, open-minded people and community groups – and getting them together to exchange opinions and criticisms about the idea of the cultural city and *MultipleXity*.

Tere finally commented that both scientists and artists are very good at focusing on an issue and dealing with complexity. Although their methodologies are not similar, they demonstrate the same level of seriousness and expertise, and recognise the value of cross-disciplinary collaboration and the value of artists in society.



PILOT CITIES

Type of session:
Presentations and panel discussion

Focus:
The UCLG project on the relationships between culture and sustainability in cities.

Moderator:
Jordi Baltà (UCLG)

Participants:
Emliano Poggio (Bergoglio 3.0)
Anna Farràs (Terrassa City Council)
Tomás Afonso (the Island Council of Tenerife)
Mafalda Sebastião (Polo Cultural Gaivotas)
Clymene Christoforou (D6 Culture in Transit)
Ivor Davies (UCLG Pilot Cities expert)

Questions:
How is culture promoting sustainability?
What are the main mechanisms to promote learning and sustainability within the Pilot Cities?

Based on Culture 21 Actions and building on the experiences of the Pilot City programs of 2014, 2015 and 2016, the culture committee of the United Cities and Local Governments association (UCLG) launched a programme called *Culture in Sustainable Cities. Learning with Culture 21 Actions*. This program enables participating cities to become ‘Pilot Cities’ of the Agenda 21 for culture, and permits them to participate in a learning, capacity building and connectivity strengthening process, on the basis of the principles and actions included in Culture 21 Actions. Two programs have been developed: the Global Pilot City program and the European Pilot City program.

The aim of this session was to explore a range of experiences, examples and views of culture and local governments for sustainable development across countries, with particular reference to the Culture 21 Action initiative, for which Pilot Cities is one of its main programs. The main aim is to promote an integrated vision of sustainable development with culture at its core and to explore the different ways in which cultural elements are integrated in sustainable cities.

The general approach of the different projects participating in this effort is cross-disciplinary and promotes collaboration and learning at the local level. The energy is directed at ‘crossing perspectives’ – that is, in trying to end the perception that culture is in some way separate from the real world.

To achieve these goals, Culture 21 created the Culture 21 Actions Toolkit to help articulate the different aspects in

which culture can cross boundaries in sustainable cities and contribute to or initiate sustainable development.

The toolkit lists nine topics for action:

- **Cultural rights**
- **Heritage, diversity and creativity**
- **Culture and education**
- **Culture and environment**
- **Culture and economy**
- **Culture, equality and social inclusion**
- **Culture, urban planning and public space**
- **Culture, information and knowledge**
- **The governance of culture**

The idea is to integrate culture into the social life of communities and people by sustainability, which is also a culture in itself. The toolkit tries to help create collaboration and learning at the local level.

The session showcased several of the projects currently being developed in different cities. The idea was to share their strategies, their different developments and to extract general considerations about the role of culture in the promotion of sustainability.

BERGOGLIO 3.0

SHOWING THAT CULTURAL HERITAGE MAY NEED ECONOMIC ENGINES BUT IS ALSO AN ENGINE IN ITSELF

Emiliano Poggio, the founder of *Bergoglio 3.0*, explained that the project revolves around a former military fortress located to the north-west of the city of Alessandria, Italy. The goal of the project is the restoration and valorisation of the fortress – that is, increasing its value via the work performed within it.

It is a huge space, extending over 17 acres. The main starting point for the project was for the leading team to find a way to bring new life to such an enormous cultural artifact; in effect, to turn it into a ‘living giant’. Another of the team’s interests was the question of how to connect the project with other spheres in a way that was consistent with the tenets of Culture 21 Actions. The sheer dimensions of the fortress were an issue to start with but, moreover, there was an additional need which was to connect it to people and make it relevant through its connection with local heritage.

One of the initial problems was to find a way of getting people to return to using the space. What would revive people’s interest in a 18th century military fortress?

Thinking big is not enough. You can think conceptually about a cultural project, but it was still a non-commercial project connected to cultural heritage and resources were needed, as in any such project. An initial economic driver was required

and it had to be implemented in such a way as to reinvest money back every year for 20 years, to be used for restoration and valorisation purposes.

The potential to connect the space with an international music festival – attracting more than 150,000 people every year from the European continent – seemed a likely candidate for that initial economic input. This also had a second effect: in order for culture to be sustainable, it needs some level of economic autonomy and for this Project, a probable solution was a public-private partnership.

This type of arrangement brings with it a high involvement of stakeholders but the resulting growth of the project achieved that ideal goal of sustainability, independence and permanence. It can be seen as an educational example in Italy, where there is a huge resistance towards approaching cultural heritage projects in this way. Individually, each project is a challenge but in the opinion of its leaders, the Alessandria Citadel project is a good example of how to overcome those challenges.

Further presentations followed, with key examples from other participating cities.

TERRASSA

Anna Farràs, who is in charge of the European and International Affairs of the Terrassa City Council in Catalonia, Spain, commented how the Pilot Cities project connected with the goals of her department in the task of representing, promoting and developing the positioning of the city.

Starting from a history that is deeply associated with the role of the city as one of the engines of the Industrial Revolution in Catalonia and Spain, the white paper on the cultural sector recognised a strong and diverse cultural sector as one of the city's main assets but also acknowledged a lack of the visibility of culture as a characteristic of the city. Also, this lack of visibility meant that most citizens were either not accessing the cultural assets, services and activities or, if they were, they did not recognise the importance of culture as part of the social capital of the city.

In consequence, and in relation to Pilot Cities, the current initiatives are aimed at improving networking among cultural projects in the city and also to develop – and this is the main challenge – a way to make culture contribute to social cohesion. These two goals are related to the aims and activities that characterise Pilot Cities and there are activities underway to improve collaboration and collective learning.

A special challenge lies in contributing to social cohesion through culture. Terrassa was designated UNESCO Creative City in 2017 and one of the main projects in their current cultural strategy is the promotion of Terrassa City of Film. This helped create effective promotion of the city, strengthened its image but more importantly – and certainly in the spirit of the Pilot Cities cause – created a great opportunity to collaborate with other cities.

TENERIFE

Tomás Afonso González who is the Cultural Planning Officer of the Island Council of Tenerife in the Canary Islands, Spain, started by describing the peculiarities of working for culture in a island setting. Tenerife itself participates in the Pilot Cities project as a special case, representing the ‘island context’ of the project.

Some of the peculiarities of this approach are inherent in the geographical characteristics of the island, which also have an influence on its culture and how that is managed; for example, it is closer to Morocco than to Spain. On Tenerife, this project is not just working at city level but it involves almost all of the 31 municipalities into which the island is divided. The way that projects for Pilot Cities are being implemented has a unique complexity since they connect all the municipalities with civil society organisations. It is certainly a complex scenario for collaboration.

To set collaboration in motion and – following Pilot Cities goals – to help promote the role of culture in the development of sustainable cities, the main challenge that identified as the management of culture in such a diverse, multi-levelled, multi-stakeholder setting. In December 2017, the second phase of the project began and involved 28 of the 31 municipalities. One of the first tools created to improve management was an

open-source platform to invite, document and organise the discourse and deliberation between the different stakeholders. In November 2018, the final design of the work program and pilot measures was completed.

LISBON

Mafalda Sebastião, co-ordinator of the Polo Cultural Gaivota (PCG) in Boavista, Lisbon, Portugal, explained how the organisation worked in relation to Pilot Cities, as an initiative to support the development of the cultural sector. The centre operates as a hub for the creators of culture. To achieve this role, the PCG started by creating value from the Polo Cultural building itself. It hosts the offices and administration services, but is mainly a collection of other facilities opened up to professional artists every day during the week. This helps turn the centre into a space of resources for cultural and artistic creation. The space also is the main venue for the PCG's cultural programmes, for which the courtyard is used in summer.

Several new initiatives started in November 2018. A new program – Gaivotas em Marvila – has been devoted to emerging artists who have not presented their work in Lisbon before. A program of residencies directed to national and international artists – which was mainly focused on the performing arts – is now open to other cultural fields and academic researchers so as to deepen its cross-disciplinary nature. In addition to these residencies, two new arts positions are also opened in a forest in Lisbon.

Beyond these activities, the PCG also works as an information hub for artists and cultural agents so that they can have support in dealing with administrative, logistical and legal frameworks.

ELEFSINA AND LEEDS

SUPPORTING PILOT CITIES PROGRAMS

It connects partners with relevant professional agencies to ensure information is correct and legal. This activity is done at the centre in person, via email or by phone and provides resources online to inform the public about ongoing projects in an accessible, non-technical way. The service and the centre as a whole are part of the On the Move network, which promotes mobility in the cultural sector.

The most important changes for PCG brought about by their participation in Pilot Cities are that artists and producers are starting to have information on the prevention of problems and are not just coming across problems directly or having to develop a solution after the fact. The centre is also developing a network with local government and at a European networks level as a result of its participation in Pilot Cities; this involvement has created a wealth of contributions continue to improve the centre.

Clymene Christoforou explained how the two cities of Elefsina in Greece and Leeds in the UK are progressing within the Pilot Cities framework. She demonstrated what can work in different cities enabling us to consider how to share such information more widely. She remarked that Pilot Cities represented an opportunity to bring together cultural participants in the cities that otherwise might not have met.

The process was mostly started by introductory presentations after people had been invited to explore how to make their cities better. This created an opportunity for thinking jointly about factors which are important to the development of a city. Later workshops helped identify issues such as the appropriation of unused or abandoned urban space.

In Clymene's opinion, in order to strengthen this process, it is important that the community champions new ideas and new thinking. In any case, it is important to capture the real meaning of the projects beyond what might be quantifiable.

SMALL DISRUPTIONS ACROSS EUROPE

GENERAL CONSIDERATIONS FROM THE UCLG

On behalf of UCLG, Ivor Davies shared a series of reflections about what is happening in Pilot Cities around Europe. Similarly to Clymene, he has an important role in promoting the processes of ‘pure learning’ across the different Pilot Cities initiatives, helping to enrich the whole process.

He remarked that Pilot Cities can be explored from three different perspectives: content, context and contact.

With respect to **content**, Agenda 21 actually offers documentation of nine commitments and 100 actions, but the main content is what emerges locally from public policy making and private content. That is, the main contribution in terms of content is the knowledge that people create in the different cities.

The point of the whole work is not just the content but the awareness of that content – what one person knows about it can be somewhat variable. With respect to aspects of cultural content, the first point in the toolkit – cultural rights’ and policy at municipal and global levels – has been given a lot of attention and work.

According to Ivor, Agenda 21 is an opportunity for a diverse field of content which challenges and broadens perceptions

of expertise on a local **context**. Does expertise have a task to create work or facilitate consumption during one's daily experience? It is, of course, all of these things and in that sense Pilot Cities provides an interesting toolkit. The way that information and knowledge are distinctively created in each city also is influenced by the way in which information and knowledge is shared among the different stakeholders in the city. The level at which this information and knowledge reach people varies very much across all cities, particularly as these digital times people have a plethora of means of communication, but there is a disconnection between the methods offer and what is really communicated.

This relates to the third perspective that Ivor proposed: **contact** – the discussion, debate, inclusion, openness and transparency that helps involve a wider group of people to find out what is happening and also to engage and participate in it. This type of engagement is not just policy making but also a form of delivery. Engagement works in the learning processes, and it is by the mutual influence of learning and engagement that each city has chances to discover what is happening elsewhere.

There were some interesting questions from the audience; for example, it was asked if whether, in the whole process of the Pilot Cities project, there was room for community organisations and not just institutions.

Jordi Baltà explained that, from the perspective of UCLG, the approach promoted by Agenda 21 and Agenda 21 Actions is a

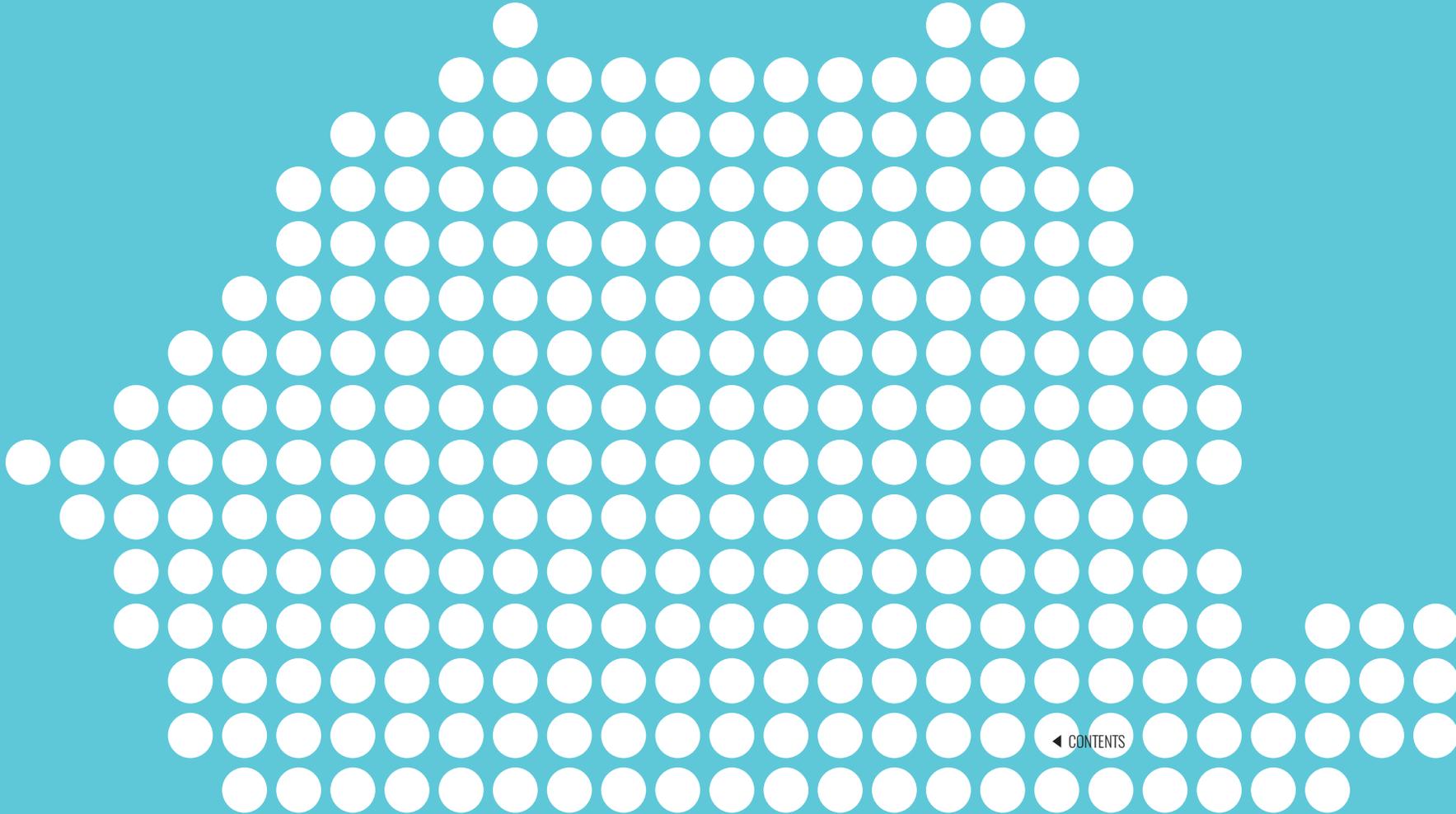
plurality in the governance of culture. At a basic level, cultural policies invoke cultural rights for everyone. That principle goes beyond access and is strongly involved with policy making. Underpinning the implementation of Pilot Cities are models of governance and culture that are collaborative and based on active engagement by a range of participants that includes individual citizens, the private sector and NGOS. UCLG and CAE attempt to symbolise the partnership of different voices; for local development to be sustainable, you have to engage all participants.

Clymene commented that, in the case of the city of Leeds, a steering group was set up which involved the cultural sector in all its diversity: it included institutions, individuals, landscape architects and effectively created horizontal engagement. In Elefsina, this is also starting to happen on the ground.

Kornelia Kiss from CAE, observed that her organisation works to ensure that this diversity – and especially the involvement of community organisations – is there from the beginning; that is, before assessment. It is important to make sure there is engagement of not just local government but of civil society too.

Jordi closed by contributing a definition of the governance of culture which should include a transversal approach, be multi-level (integrating local, regional, national and European levels) and have mixed governance. This last point is challenging, since it has to manage a complex set of relations. However, it is essential.

ctrl STORIES



◀ CONTENTS

Moderators:

Corinne Szteinsznaider (Michael Culture)

Noel Kelly (Visual Artists Ireland)

Participants:

Peter Purg (MAST Project)

Noemi Salantiu (Edgeryders)

Natalia Skoczylas (Edgeryders)

Camilla Collombo (Ohme)

Levente Kozma (Simultan, Transcultures)

Philippe Franck (Simultan, Transcultures)

Luis Graça (Cultivamos Cultura)

Špela Petric (Artist 6 researcher)

Diana Andone (UPT)

Manuel Beltrán (Institute of Human Obsolescence)

Focus:

The interchange of experience, expertise and strategies of different participants in the arts, science, technology, education and cultural management dealing with interdisciplinarity and learning in these areas.

This format was created as a means for fast interaction and networking. There were two STORIES sessions and in each session, there were several stories pitched by one or more people to the rest of the participants. This was followed by more in-depth conversation or 'break-out' sessions. It was a very intense format with a lot of interactions and information being exchanged. Here, we summarise the main points of each session.

PETER PURG AND THE MAST CONSORTIUM

edgeryders.eu

The MAST project is developing an applied post-graduate study module at the intersection of art, science and technology, combining methodologies and practices that entwine the academic sphere closely with the cultural and creative sectors.

Nurturing a critical perspective on the historical, economical, social and, above all, cultural relevance of this interdisciplinary blend within the new digital shift, the MAST project develops innovative, ICT-enhanced teaching and learning methods.

Students from different countries and disciplines will, under the mentorship of engineers, scientists and artists, and in partnership with relevant NGOs and industry partners, jointly tackle challenges emerging from the paradox between the disparate agendas of Europe's ambition towards innovation on the one side and the need for social equity on the other.

The MAST Consortium combines institutions that provide art education and training in very diverse ways and environments. Together with its associate partners, the MAST project contributes to the advancement of both business and education, while maintaining the tension that art and commerce have always had. The MAST consortium does not intend to ignore this tension but, rather, to address it fully, including not only teaching business culture but also organisational techniques,

which may be expressed in many ways. In particular, MAST will seek to explore the ways that the crossover between art, science and technology might be socially transforming in a variety of enterprising organisational forms, including business, non-profit, free or open software, collaborative platforms and others.

The developed Masters study module would comprise of a total of 30 European Credit Transfer System points (ECTSs) in MAST-specific courses, ranging from four to eight ECTSs from the likes of workshops, seminars, industry-challenge courses and tandem mentorships, mostly focusing on the practical competence, trans-disciplinary knowledge and transferable skills.

The project would also develop guidelines for career-development to engage employment partners into the final academic work and integrate mechanisms of direct work placement, internship or scholarship schemes, including realm-specific residency, incubation and mobility. The latter would cover another 10 to 30 ECTSs (depending on the final thesis or project within the curriculum) of MAST-related final graduate work and mentoring support, such as within a Masters thesis and/or final project.

This year, the challenge is about the future of work: how is work – with its conditions, tools and methods – to be rethought and redesigned in order to meet the challenges of the future, and how can this bring about a new and positive European citizenship?

MAST ran an analysis of its operation trying to find its strong and weak points, opportunities and challenges.

Its strengths were:

- **Expertise of associating in the art, science and technology (AST) triangular domain**
- **Strong secondary networks**
- **Dedication to set goals (activism)**
- **Teaching expertise and legacy**
- **Artistic excellence**

Its weaknesses were:

- **Diversity of motivation**
- **Lack of translation experience between sectors**
- **Differences between NGO and university partners in thinking and working styles, as well as infrastructure**
- **Lack of time for quality personal interactions and the development of content**

Opportunities presented were:

- **MAST is an attractive project for many external stakeholders**
- **The willingness and capacity to align with EU priorities**
- **The creative class gets paid for their ideas and work**
- **Producing viable ideas, services and products by combining AST domains**
- **Sustainability is likely due to the supporting of relevant contemporary topics**

Potential threats were:

- **MAST's good intentions could be hacked by neoliberal corporate dominance**
- **It becoming too radical or critical towards the EU's technology mainstream (meaning that MAST is not adopted or marginalised)**
- **It becoming irrelevant in the present political context**
- **It succumbing to traditional models of organisation and ideologies**

Edgeryders is a community of 'change-makers'. Its name is inspired by the innovations produced on the edges of culture by the mostly unrecognised agents in the landscape of knowledge creation and exploration. It mobilises more than 4,500 people who are engaged in more than 100 project teams. Edgeryders reaches out to what it calls the 'radicals' and not the 'complainers'. Its mission is to co-create self-sustaining projects for the common good.

'Self-sustaining' means that each project creates enough financial and non-financial value to compensate the people working on it. A key challenge is for people with aligned interests to connect with each other and, as a community, Edgeryders tries out to enable that.

The community lives in symbiosis with a social enterprise, also called Edgeryders. The company sells expert advice and research as well as funding community infrastructure and supporting the community's projects; in return, community members collaborate with the company's endeavours.

Edgeryders has set up a process to spark initiatives which begins with a convincing story that can engage several types of participant. It is not a process that works purely online or offline, actually following a collaborative model inspired by platforms

TRANSCULTURES
transcultures.eu
LEVENTE KOZMA AND PHILIPPE FRANCK

such as Wikipedia. It starts with a problem or challenge to be publicly solved and the invitation for prospective innovators to find ways that a network model can help produce this solution.

An online conversation is the first step in a process that tries to produce knowledge from interaction. Every year there are new participants and the project's reach is international. To successfully develop a Project, Edgeryders hires community 'mobilisers' from existing initiatives and networks to incrementally set up a network. It is of the utmost importance for the sustainability of Edgeryders' projects that the community owns and validates the resources of the Project, and funds are assigned on this basis.

Edgeryders organises an annual meeting to share the lessons learned in developing each of its projects. Its work recognises the importance of being a 'neutral space', something that institutions are unable to be.

Transcultures is an interdisciplinary centre of digital and sound culture based in the Charleroi area of Brussels, Belgium. It started in 1996 to encourage and develop interchange between various contemporary artistic and multimedia practices and dimensions, including the arts in relation to society and technology, with the main focus on sound and digital creativity.

[FROM PRODUCTION TO DISTRIBUTION]

Transcultures has supported Belgian and international artists, co-produced a large number of intermedia, digital and sound artworks, and organised international art festivals and special events. They consider the production approach as part of the process from conception to dissemination of a project. Besides its festivals and events, Transcultures also showcases its productions in other Belgian and international locations, at larger events and through supported works.

[SOUND AND DIGITAL EMERGENCES PROGRAM]

Apart from its initiatives to raise public awareness about digital and sound arts, Transcultures supports young artistic talent

from Belgian and European art schools (also organising creative exchanges between them), whose works are then presented in City Sonic, Transnumériques and associated festivals and events.

**[INTERNATIONAL FESTIVALS AND NETWORKS:
CITY SONIC, TRANSNUMÉRIQUES AND THE PÉPINIÈRES
EUROPÉENNES DE CRÉATION]**

Launched in Mons, Belgium, in 2003, City Sonic is a sound art festival dedicated to the diversity of contemporary sound creation through urban space. It features an itinerary of installations in the city, in addition to performances, concerts, workshops, lectures and special events. City Sonic is now travelling to other Belgian cities, as well as internationally.

Transnumeriques, also initiated by Transcultures in 2005, is a festival dedicated to digital cultures and new hybrid creative practices, featuring digital arts exhibitions, intermedia performances, lectures/debates and workshops. These are organised in various cities in the Federation of Wallonia-Brussels. Transnumériques is also a platform for digital and media arts, broadcasting emergent or renowned artists, and linking various Belgian and international cultural structures.

Transcultures is the national co-ordinator of the Pépinières Européennes de Création, an international network which facilitates and fosters the mobility of young artists and creative

multi-disciplinary and interdisciplinary projects on the European and international art scenes. Transcultures is also an active member of other international networks such as RAN (Digital Arts Network) and takes part in regular international exchanges.

[THE SECONDARY SONIC SPACE]

This new project initiated by the Simultan Festival, Timisoara 2021 in partnership with Transcultures and the Pépinières Européennes de Création explores the sonic landscape of Timisoara through collective action in a process which investigates the phenomenon of urban transition, memory and temporality.

The Secondary Sonic Space installation (premiered in Timisoara in October 2018 in the framework of the *Beyond the Obvious 2018* event) uses different sounds collected during previous workshops with young Romanian artists co-ordinated by Belgian sound artists, teachers and curators Raymond Delepierre and Philippe Franck. The sounds are broadcast on metal plates in the middle of the Experimentarium space in Timisoara, as well as via cylinders recovered on site.

Another space adjacent to the sound installation enables the public to read the blog created especially for the occasion, as well as videos made by Romanian artists. This multi-layered device provides a platform for the observation and rediscovery

of the city's sonic space from the processing of a dynamic bank of recordings. This project was conceived as a site-specific matrix which can also be adapted to other cities and locations with the participation of other artists.

OHME
ohme.be
CAMILLA COLOMBO

Ohme is a Brussels-based organisation that focuses on the curation and production of creative content, as well as the production of entertaining events highlighting the links between science, the arts, technology and society. They create alliances and partnerships between diverse members of the scientific and artistic communities in Brussels and abroad.

Ohme produces and curates multiform events, performances and conferences presenting scientific, technological and artistic practices and projects, always with an eye on accessibility and the sharing of knowledge.

Its team has a diverse interdisciplinary background, although it is mostly led by engineers. Nevertheless, they typically have both scientists and artists working in tandem on their projects and follow a collective equality of process, which is simultaneously curatorial and participatory. They interconnect students and academia with art institutions via a strong connection with the French speaking university in Brussels.

Camilla presented a very special case Ohme's history: a small scale European project which didn't get the EC funding needed to start it off, and was conceived to break boundaries between academic teaching in artistic, technical and managerial disciplines. The project, called Epicycle (a small circle whose

centre spins around the circumference of a larger circle), has been the object of deeper reflection on what it means to challenge academic and artistic institutions, and how different participants can make things happen in a different way, thinking ‘outside the box’ in order to create meaningful value for the students and instill fresh energies and ideas in the system.

CULTIVAMOS CULTURA

cultivamoscultura.com

LUÍS GRAÇA

Luís Graça brings his background in science to his collaborations with Marta de Menezes in Cultivamos Cultura. With the session’s audience, he explained how they explore complex concepts and new horizons of research through a hybridisation of artistic and scientific practices. Probably the most well-known area of this work is the one that he presented as ‘biological artworks’; that is, practices that used biological research to create works from an artistic perspective. However, these works were not just a challenge to the artist but also a way to convey, explore and criticise what was going on in real scientific laboratories.

Their work has continuously tried to show the view from the laboratory and also created a discussion space for scientists themselves to explore questions and improve their research. It also exposed them to the dilemmas inherent in communicating their work.

One of the examples he showed was how to explore the ideas of immortality using two cells; this also connected and questioned some common ideas about individuality and identity.

Luís remarked that there was a real gap between citizens and science, largely produced by the way that science is communicated through the mainstream media – media which

are now prey to the new forms of manipulation known as ‘fake news’. News about science research is far from immune from these new forms of manipulation, and AI also has a role by promoting the dissemination of fake news or by wrongly interpreting news or information about science. This adds to the distance and misunderstanding between the public and real science, particularly in their grasp of how science is practiced in laboratories. So, the goal of Luí’s work is to talk about scientific truth and how to put it across to the public without it being either watered down or misunderstood.

UPT-ELEARNING

DIANA ANDONE

Diana Andone shared with the audience how UPT e-Learning’s work at the crossroads of ICT, e-learning and multidisciplinary approaches has shaped her vision and research on how to connect creativity across different disciplines.

For her, the STC triangle poses new challenges to the education system, and in her view, there is a connection in the formation of all creative people, whether they be artists or technicians.

Digital competence is a common thread drawing them together and in her opinion the digital is a language that can spark new forms of creativity that should be cultivated in the education system. E-learning makes it easier for people from different backgrounds to connect with different pools of knowledge and practices, opening up the possibility of further interdisciplinary collaboration.

ŠPELA PETRIČ ARTIST AND RESEARCHER

Špela Petrič shared her work in practicing art with living systems. For her, this was the way to go in the 21st century – that is, art and science should be practiced as a hybrid. This can be a way to anticipate critical translation and in her work it is implicitly understood that the current rate and scale of global change makes it almost impossible to be in control. One strategy is to adapt instead.

She illustrated her approach by sharing some of her projects. For example, *Humalga: Towards the human spore*, made in collaboration with Robertina Šebjanič, explores another way to look at human evolution. It proposes an alternative, constructed evolution of the human species and explores a biotechnologically engineered, post-technological vehicle, which grants humans the resilience of simple, undifferentiated organisms while preserving the human phenotype, behaviour and culture. Biotechnologically, the proposal involves creating a ‘trans-species’, the *humalga*, by genetically hybridising and modifying human and alga in such a way that both organisms appear as morphologically distinct living entities, which xenogenetically alternate as sexual and asexual generations.

Through wet media installations and theoretical essays, the project examines new technologies which enable the creation of the novel trans-species with proof-of-concept experiments

and through its radical position exposes the numerous biases and controversies of the present. Among other issues, it explores the human instinct to survive as a species, assesses the project within the current ecological anxiety, considers the implicated bioethical issues and envisions future scenarios involving the *humalga*.

THE INSTITUTE OF HUMAN OBSOLESCENCE

speculative.capital/

Manuel Beltrán explained how the Institute of Human Obsolescence (IoHO) applies artistic and research practices to the frontier between art and science in order to tackle the very pressing realities of the algorithmic and biotechnological world.

Its approach is speculative but also based on impactful communication. That is, they create works that question the preconceptions of the public directly and that may lead people to reconsider the present realities around topics in science and technology.

He illustrated this approach with two projects that revealed and questioned the current interconnection of our lives with the production of value through data. For Manuel, the actual asymmetry of power between data producers and data capitalists hinges on the control of our lives and bodies. The installation *Biological Labour* was thought to make this connection evident.

It consists of a working station in which individuals wear a special body suit that harvests their body heat, which is then transformed into electricity and used to power a computer producing cryptocurrencies. The project seeks to make more evident the connection between working bodies and the production of wealth.

From this speculation on how labour might soon be redefined, Manuel brought us back to the present, and introduced the project *Data Production Labour*, in which the IoHO explores the new, technologically-mediated contemporary realities of labour. The installations visualise the problems of the economic, social and military exploitation to which human behaviour is subject. This concept of ourselves being individuals that are continuously working through the production of data is further exposed by the metaphor of seeing ourselves as ‘data workers’. It is a denunciation of the current exploitative arrangement of surveillance capitalism.

This concept is complemented with the declaration of a ‘Data Workers Union’, a proposal for the creation of a new imaginary collective of humans as ‘Data Workers’ that aims to create a new form of emancipatory collectivity, capable of getting to grips with and building political agency into the asymmetries emerging from ‘surveillance capitalism’.

CONTRIBUTORS' BIOGRAPHIES

TOMÁS AFONSO

Among his qualifications, Tomás has an Education Degree in Philosophy and Education Sciences (1997) from the University of La Laguna, Tenerife, Spain, is a qualified University Expert in Planning and Cultural Management (2002) from the same university, was a Postgraduate in Management and Cultural Policies at the University of Barcelona, Spain (2006), and a Specialist in Public Policies of Cultural Management (2009) by the National Institute of Public Administration of Madrid, Spain.

In addition, he has completed other training programs such as the Specialization Course on International Cultural Relations (2011) at the Center for Advanced Studies of the Organization of Ibero-American States and is a Professional Expert in Management and Administration of Foundations (2013) from the National University of Distance Education (UNED), all earned during his 18 years of training and professional work in the fields of management and public cultural policies.

Since 1998, he has worked as Cultural Manager in several local administrations on the island of Tenerife, teaching courses related to the management of culture. Since 2007, he has been Senior Technician in Management and Cultural Planning in the Administrative Service of Culture at the Island Council of Tenerife.

DIANA ANDONE

Diana Andone is the Director of the eLearning Center at Politehnica University of Timisoara (UPT), Romania. She runs the team who developed and managed daily integration of the university's award-winning Virtual Campus CVUPT. She is also a lecturer at UPT in the field of multimedia and web technologies. She is passionate about the all-pervasive access to digital technologies and how they can be used to improve people's lives.

Andone holds a PhD in Designing eLearning Spaces for Digital Students from the University of Brighton, UK, an MA in European Studies, a 'Learning about Open Learning' postgraduate distance education course from Herriott-Watt University, Edinburgh, UK, an MSc in AI at the UPT, Romania. She has also held different positions in universities in the UK, France, Finland, Greece and Germany as well as being involved in 21 EU-funded projects. She received the EDEN Fellow Title (European Distance and E-Learning Network) in 2012. Her engagement extends to several professional organisations and associations, along with a role on the Board of local Romanian NGOs (Pentru Voi Foundation) and is a member of Rotary International.

YAMAM AL - ZUBAIDI

Yamam Al- Zubaidi has worked in EU equality law and human rights for more than 10 years, both in Sweden and internationally. He is now the Equality and Diversity Manager at the National Theatre of Sweden (RIKSTEATERN). Yamam is on the executive board of Culture Action Europe and also on the board of directors of the Swedish National Council of Adult Education.

TERE BADIA

Tere Badia holds a degree in Art History from the Universitat de Barcelona and a MA in the Information and Knowledge Society from the IN3 (Internet interdisciplinary Institute) of the Universitat Oberta de Catalunya, Spain.

She is dedicated to cultural research and production in various formats and has carried out several studies on cultural policy, networks and R+D+i (research and development) for the visual arts. Tere has curated exhibitions and projects of contemporary art and been professionally linked to the Interarts Observatory, Catalunya, Spain, in the 1990's, and also the communication and multimedia agency Goetzing&Komplizen (Karlsruhe, Germany). Tere co-ordinated the platform *DISONANCIAS* in Catalonia for the promotion of relations between artists and the research departments of companies and organisations, as

well as the Catalan network of visual arts production spaces at xarxaprod. Until January 2018, Tere was director of Hangar, the centre for artistic production and research in Barcelona.

JORDI BALTÀ

Jordi Baltà Portolés works as an advisor for the Committee on Culture of United Cities and Local Governments (UCLG), providing research and advice to local governments with an interest in developing cultural policy and sustainable development. He is also a freelance researcher, consultant and trainer in the areas of cultural policy and international affairs for a range of organisations. Previously he was a researcher and project co-ordinator at the Interarts Foundation (2001-14). He is a member of the UNESCO Expert Facility for the implementation of the Convention on the Diversity of Cultural Expressions.

Jordi teaches at the Online MA in Cultural Management at the Open University of Catalonia (UOC) and the University of Girona (UdG), as well as the degree course in International Relations at the Universitat Ramon Llull (URL).

MANUEL BELTRÁN

Manuel Beltrán is an artist, activist and researcher who was involved in the *Indignados* movement in Spain, the Gezi Park protests in Istanbul, Turkey and much more independent activism and cyber-activism in Europe and beyond. In 2012, he co-founded the arts collective Plastic Crowds and since 2013 he has been head and co-founder of the nomadic school and artists' organisation Alternative Learning Tank. In 2015, he founded the Institute of Human Obsolescence, through which he explores the future of labour, the socio-political implications regarding our relationship with technology and the economic and governance systems surrounding the production of data.

DAN BUGARIU

Dan is software architect and entrepreneur. He is co-ordinator of *MultipleXity*, president of the Smart City Association, government adviser on OGP Romania and co-founder of Growceanu Angel Investment. Some of his current projects are *MultipleXity*, *Upgrade My City*, the Timisoara Startup Ecosystem and the Timisoara Data Portal.

CHRIS BRUCKMAYR

Chris Bruckmayr studied Communication Science and Politics at Vienna university and has been director of products at Ars Electronica Solutions since 2018. From 2013-17, he was business manager and creative producer for the Ars Electronica SPAXELS® crew, and is a sound and performance artist who, under the name ‘raum.null’, produces dark techno for the vinyl-only record label Belgrade Dubs. From 2015-18, he also presented and promoted performances at the Ars Electronica Festival.

CAMILLA COLOMBO

With one foot in producing performing arts and the other in European cultural policy, Camilla has worked in Italy, the UK, Chile and Belgium. Always interested in hybridisation and the blending of disciplines, Camilla has worked for art organisations of all sizes, focusing on multidisciplinary and multimedia theatre production and project management.

She holds a MA in Performing Arts Management from Bocconi University, Milan, Italy, and an MA in Arts Administration and Cultural Policy from Goldsmiths University, London, UK, during to which she did extended research on European Cultural Networks. Since 2016, she has been based in Brussels, where she has worked for different cultural networks and where,

with a group of engineers, she co-founded Ohme, a collective curating and producing educational and artistic content at the nexus between arts and sciences.

CHRIS CSÍKSZENTMIHÁLYI

Chris is European Research Area Chair at the Madeira Interactive Technology Institute, Portugal, and is director of the Rootio Project, a socio-technical platform for community radio. He has been a professor at various colleges, universities and institutes, from Parsons School of Design, New York, to MIT, Massachusetts, USA. He co-founded and directed the MIT Center for Future Civic Media (C4), which was dedicated to developing technologies that strengthen communities. He also founded the MIT Media Lab’s Computing Culture group, which worked to create unique media technologies for cultural and political applications.

Trained as an artist, he has worked in the intersection of new technologies, media and the arts for 16 years, lecturing, showing new media work and presenting installations on five continents and one subcontinent. His work has been featured in venues ranging from the BBC, the *New York Times* and the *Washington Post* to *Art Journal*.

CLYMENE CHRISTOFOROU

Clymene is a founding member and executive director of D6: Culture in Transit, where she oversees program and arts development, focusing on international collaboration and developing a strong international platform for local engagement.

Clymene works to promote internationalism locally as Chair of the Board of International Newcastle in the UK and also sits on the Board of Directors for Res Artis, an organisation spanning 70 countries which is dedicated to promoting the value of residential art programs. She is also an active member of Culture Action Europe and, through that position, advocates putting art and culture at the heart of public debate and decision-making. She has put this into practice through her work as a trainer for Culture Bridges, a British Council Initiative to develop cultural partnerships between the UK and Ukraine, and in her role as Lead Expert for Pilot Cities, a project helps cities to develop their sustainable development and cultural policies.

CARMEN CROITORU

Carmen Croitoru is Director General at the National Institute for Cultural Research and Training. Also a professor at the National University of Theatre and Cinema, she has 20 years of experience in teaching cultural management. She has

been engaged in administration and development of cultural management in Romania and her involvement extends to several national and international professional networks. She is member of ENCATC and Europeana, a national representative member for the EU Commission for Creative Sectors, a representative in the Steering Committee for Culture and Heritage at the Council of Europe (CDCPP), founder of the Professional Association for Romanian Cultural Managers and a co-founder of the ECUMEST Association.

Croitoru is a graduate from the Academy of Theatre and Film of Bucharest and has a Masters degree in Theatre Studies, as well as a Masters degree in Cultural Management, a PhD in Theatre Studies and an accreditation for training and evaluating cultural public institution managers. She has played major role in contributing to the cultural creative sectors through her research, as well as her engagement in several important cultural projects in Romania.

IVOR DAVIES

Ivor is an independent adviser and researcher in international cultural policy, with extensive expertise in European, national and local contexts. His long-term project – *artseurope50: bridges in European arts policy* – aims to foster new inter-disciplinary connections between the arts sector, civil society and policymakers, and research more coherent approaches to shared cultural decision making.

Originally grounded in theatre, Ivor has diverse experience across the arts, education, independent consultancy and public policy. Previously (2000-2010) he was Director of Performing Arts for Arts Council England and Acting Director: International Strategy (2009). Since 2010, he has worked widely across Europe, researching and shaping new ideas and alliances. For several years he has been working independently with Relais Culture Europe (France), as a core member of I-TEAM, a continent-wide peer-learning program on art and politics in an evolving Europe. In 2016, he was commissioned by Culture Action Europe as researcher/writer of a new reader on cultural networking and became Programme Associate for Agenda 21 for Culture: Pilot Cities in partnership with United Cities and Local Government.

LARS EBERT

Lars is managing board member and programme co-ordinator of the cultural centre Castrum Peregrini in Amsterdam, The Netherlands. He also works as an independent advisor in higher education and the arts for clients such as the European League of Institutes of the Arts (ELIA), the primary network for Higher Arts Education in Europe for which he has previously served in various roles, most recently as deputy director.

Lars is co-founder and chair of the board of EQ-Arts, the first transnational sector-specific accreditation agency for the arts.

He has extensive expertise in developing and implementing EU-funded projects and engages in organisational development, both on a strategic as well as on operational level as an external reviewer or ‘critical friend’. He is a frequent facilitator, moderator and speaker during international events. Lars holds a post-graduate degree in theology.

PHILIPPE FRANCK

Art historian, sound and interdisciplinary artist, essayist and art critic, Philippe Franck (Belgium) is the director and founder of Transcultures. He is also the founder and director of the international sound art festival City Sonic since 2003 and Les Transnumériques digital arts and cultural biennale since 2005. Franck has curated many sound, multimedia and interdisciplinary exhibitions, events and festivals in Belgium, France and abroad. From 2010 to 2016, he has also been in charge of the urban music, sound art and interdisciplinary arts for Le Manège in Mons, Belgium. He is the representative of the Pépinières Européennes pour Jeunes Artistes for the French-speaking part of Belgium. He has also taught on digital arts at the National Visual Art School La Cambre, Brussels since 2006 and at Saint-Luc, Brussels.

LUIS GRAÇA

Luis Graca has an MD from the University of Lisbon and a PhD in transplant immunology from the University of Oxford. He is Professor at Lisbon Medical School, directing a research group in cellular immunology. His most significant scientific contributions have been in the fields of transplantation and auto-immunity.

Graça has collaborated with several artists, including in a long-term working relationship with Marta de Menezes (www.martademenezes.com), a pioneer in the field of bio-art with an extremely diverse approach, having produced artworks involving genetics, microbiology, developmental biology, structural biology, biotechnology, neuroscience and immunology. Her work has been exhibited worldwide.

FIEKE JANSEN

Fieke Jansen is a PhD candidate at the Data Justice Lab at Cardiff University, Wales, UK, and a freelancer in the fields of human rights, privacy and technology. She is interested in re-politicising data and technology through understanding its historical, social, cultural and political contexts in Europe. Prior to starting her PhD, Fieke worked at Tactical Tech, a Berlin-based NGO, as the project lead for their Politics of Data programme. At the Dutch Development organisation, Hivos, she was engaged in topics at the intersection of human rights, the Internet and freedom of expression.

VLADAN JOLER

Professor Joler is Share Foundation director and professor at New Media department at University of Novi Sad in Serbia. He is leading a SHARE Lab, a research and data investigation laboratory for exploring different technical aspects of the intersections between technology and society.

NOEL KELLY

Noel Kelly is Chief Executive Officer of Visual Artists Ireland, the country's representative body for visual artists. He is a fellow of The Royal Society for the Encouragement of Arts, Manufactures and Commerce (RSA), President of the International Association of Art Critics – Ireland (AICA Ireland), Chair of the Royal Dublin Society Visual Arts Awards, a board member of the International Association of Art Critics – International (AICA International) and a board member of Culture Action Europe

He is directly responsible for the delivery of the tri-annual report *The Social, Economic and Fiscal Status of the Visual Artist in Ireland*; the development and introduction of Payment Guidelines for Visual Artists (Republic of Ireland and Northern Ireland [UK]); the development of formal and informal international artist and information exchange via collaborations with organisations such as HIAP, Finland, AN,

UK, Artquest, UK and CCI, France; varied Pan-European visual arts programmes; and the creation of Ireland's National Day for Visual Arts – Get Together.

LEVENTE KOZMA

Levente is a co-founder of the Simultan Association (2005) and Director of the SIMULTAN Festival for interdisciplinary arts, experimental music and sound. He works in the field of video, photography, installation and performance. As an artist, he has participated in a variety of projects in Romania, UK, Hungary, Serbia, Northern Ireland, USA and Germany. He graduated from the faculty of Arts of the West University of Timisoara, Romania.

BRUNO LEPRI

Bruno Lepri leads the Mobile and Social Computing Lab (MobS) at the Bruno Kessler Foundation in Trento, Italy. Bruno is also a research affiliate at the MIT Connection Science initiative and he has recently launched an alliance between MIT Connection Science and the Bruno Kessler Foundation on Human Dynamics Observatories. He is a senior research affiliate of Data-Pop Alliance, the first think-tank on Big Data and Development, co-created by the Harvard Humanitarian Initiative, MIT Media Lab, Overseas Development Institute, and Flowminder to promote a people-centered big data revolution.

In 2010, he won a Marie Curie Co-fund post-doc fellowship and has since held post-doc positions at FBK and at MIT Media Lab. He holds a PhD in Computer Science from the University of Trento and also serves as consultant to several companies and international organisations.

Recently, he co-founded Profilio, a start-up active in the field of AI-driven computational marketing. His research interests include computational social science, personality computing, urban computing, network science, machine learning and new models for personal data management and monetisation. His research has received attention from several international press outlets and obtained the James Chen Annual Award for best UMUIAI paper and the best paper award at ACM Ubicomp 2014. His work on personal data management was one of the case studies discussed at the World Economic Forum.

ROBERT MANCHIN

Robert Manchin is the president of Culture Action Europe and the President of Europa Nova. He is also a Distinguished Senior Scholar at the University of Pannonia Köszeg Knowledge Center, Hungary. Previously, Robert was the Senior Vice President of the Gallup Organisation, Princeton, New Jersey, USA, and the Chairman and Managing Director of Gallup Europe.

ALEX MESZMER

Alex is a visual artist, curator and a member of the National Committee of VISARTE – Association of Professional Artists, Switzerland. Meszmer works closely with IGBK Berlin as an expert for the European Commission on questions regarding artists' mobility. Together with his partner Reto Mueller, he is organising a digital archive about the Swiss village Pfy, running the Transitory Museum, an ever-changing museum, searching for the beauty of democracy with their club 'désirer'.

JOANA MOLL

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Joana is a Barcelona- and Berlin-based artist and researcher. Her work critically explores the way post-capitalist narratives affect the alphabeticisation of machines, humans and ecosystems. Her main research topics include Internet materiality, surveillance, social profiling and interfaces. She has lectured, performed, published and exhibited her work in different museums, art centres, universities, festivals and publications around the world. She is also the co-founder of the Critical Interface Politics Research Group at Hangar, Barcelona, and the co-founder of the online collective The Institute for the Advancement of Popular Automatism. She is currently a visiting lecturer at Universität Potsdam and Escola Superior d'Art de Vic, Barcelona.

SIMONA NEUMANN

Simona has been CEO for Timisoara 2021 - European Capital of Culture, Romania, since January 2013. On behalf of the city, she has successfully led the four-year bidding process for this auspicious title. She has 19 years of professional experience in managing multi-stakeholder programmes in a Romanian and international context for culture, education, public diplomacy and the development civil society. She has also worked at the European Commission, Brussels; UNDP, Bucharest; the Institute for International Education, Washington, DC; and the West University and the Intercultural Institute, both in Timisoara. She holds a PhD in Public Diplomacy from Babes-Bolyai University, Cluj, Romania, and specialised in strategic management of non-profit organisations in the Kennedy School of Government at Harvard University, Cambridge, MA, USA.

ŠPELA PETRIČ

Špela Petrič BSc MA PhD is a Slovenian new-media artist and former scientific researcher who currently divides her time between Ljubljana, Slovenia and Amsterdam. Her practice is a multi-species endeavour, a composite of natural sciences, wet media and performance. She envisions artistic experiments that enact strange relationships to reveal the ontological and epistemological underpinnings of our technological societies and challenge the scope of what is possible.

Much of her recent work has focused on plant life and has been shown at many festivals, exhibitions and educational events including Abandon Normal Devices (UK), Venice Biennial of Architecture (Italy), Touch Me Festival (Croatia), Pixxelpoint (Italy), European Conference on Artificial Life (Italy), Playaround (Taiwan), Harvard (Zambia), Ars Electronica (Austria), National Centre for Biological Sciences (India), HAIP (Slovenia), Arscope (Germany), Mutamorphosis (Switzerland) and Galleries de la Reine (Belgium). She has also received several awards for her work, including the White Aphroid for outstanding artistic achievement, the Bio-art and Design Award and an honorary mention at Prix Ars Electronica.

PETER PURG

Peter leads the New Media module in the Digital/Media Arts and Practices graduate/postgraduate programme at the School of Arts, University of Nova Gorica, Slovenia, where he acts as Associate Professor, projects co-ordinator, researcher, artist and expert in the realms of culture and media.

He currently leads the interdisciplinary project MAST (Module in Art, Science and Technology), as well as School of Arts' teams in the PAIC (Participatory Art for Invisible Communities) and the EmindS projects. Peter is co-ordinator of www.adriart.net/ce, a Central European Exchange Program for University Students network of art

academies from Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Poland, Serbia and Slovenia.

NOEMI SALANTIU

Noemi specialises in community building by encouraging and inspiring diverse citizens to collaborate using online and offline tools. She co-founded Edgeryders, a global collective doing advanced network mapping to support debates, citizen consultations, project making and events that engage participants across cultural, social and political strata in society.

RAMÓN SANGÜESA

Ramón is a professor at the Polytechnic University of Catalonia, a researcher affiliated with the Center for Organizational Innovation, the Department of Sociology at Columbia University, New York, and Senior Fellow of the Strategic Innovation Lab at the Ontario College de Art and Design (OCAD) at the University of Toronto, Canada, as well as being a collaborator with the Illinois Institute of Technology, Chicago. He has been a professor teaching the Design Masters degree at BAU, LCI and Elisava schools in Barcelona. He is currently the director of research in technology at the Elisava School of Design and Engineering in Barcelona, and collaborator of the

Elisava Research and DESISLAB Elisava groups. He directed the Data Transparency Lab, a research project to deliver privacy preserving technologies, from 2014 to 2017.

NATALIA SKOCZYLAS

Natalia Skoczylas is a nomad, working in various fields as a music critic and freelance journalist, project manager, museum curator, event producer and community manager. She is deeply interested in politics, equality, solidarity, social justice, feminism, contemporary art, and free technologies.

CORINNE SZTEINSZNAIDER

Corinne is Co-ordinator of Michael Culture (Association Internationale Sand But Lucratif) since 2013, the European trans-sectorial network for valorisation of digital cultural heritage at public and private cultural institutions and ministries of Culture and Universities. Before she started to work full time at Michael Culture, Corinne worked for Dédale from 2013-2015 as Manager of European and International development, where she developed two Creative Europe projects linked to art, culture, public spaces and the empowerment of citizens, and other research projects linked to digital and social innovation.

Corinne is now in-charge of co-ordination and development at Michael Culture, focusing on the relationship between ministries, their communities and culture, research, art and technology, and she also manages the association's European projects, mainly under the Horizon 2020 program.

JUTTA THIELEN-DEL POZO

Dr Thielen-del Pozo is Head of Unit at the Joint Research Centre, the in-house science and knowledge service of the European Commission. She is responsible for strategic scientific development programmes including the JRC's Centre for Advanced Studies, Exploratory Research, Art and Science, Collaborative Doctoral Partnerships, Open Access Research Infrastructures and Education and Training. Working at the science and policy interface is allowing her to directly turn science into information and action that is of relevance for our policies and societies.

CHRIS TORCH

Since 1996, Chris has been the founder and artistic director of Intercult, a publically-financed institution, based in Stockholm, Sweden and a designated Europe Direct office, managed within the institution's European Resource Center for Culture

since 2009. In 2011, Torch continued at Intercult as Senior Associate and Program Director, combining with other long-term European projects such as *Matera* 2019 (as part of the artistic direction group) and *Rijeka* 2020 (as part of the bid team and Program Director).

Apart from large-scale project design, Torch plays a role in developing intercultural politics. He lectures regularly and is currently on the Board of Culture Action Europe. He has also served as a Trustee for The European Museum Forum (2008-2013), as a Board member of the River//Cities Platform (2005-2012) and on the Steering Group of the Platform for Intercultural Europe (2008-2013). He is currently Head of the Artistic Unit at Timisoara 2021 – European Capital of Culture, after working with the bid team in the closing months and taking the position in January 2017.

NICOLA TRISCOTT

Nicola is a cultural producer, curator, writer and researcher, specialising in the intersections between art, science, technology and society. She is founder and Artistic Director/CEO of Arts Catalyst, and Principal Research Fellow in Interdisciplinary Art and Science at the University of Westminster, London, UK. Arts Catalyst is one of the UK's most distinctive arts organisations, distinguished by its ambitious artist commissions that engage with science, including notable projects by Tomas

Saraceno, Ashok Sukumaran, Aleksandra Mir, the Otolith Group and the Critical Art Ensemble. Nicola lectures and publishes internationally, including authoring books on art and technology in the Arctic, art and space, and ecological art. She blogs at www.nicolatriscott.org.

PEDRO VELAZQUEZ www.linkedin.com/in/pevela

Pedro has been the Deputy Head of the Creative Europe Unit since January 2018. Between 1987 and 2014, he occupied several positions within the European Commission at the Directorate of General Education, Youth, Sport and Culture, specialising in the fields of Sport and Communication. During 2014, he was directly responsible for the Communication team, which launched the Erasmus+ and Creative Europe programmes. Between 2015 and 2017, he was Director for Social Innovation and Empowerment at the ICSS, an NGO based in Qatar, where he was responsible for the development of initiatives and projects based on the educational and social power of sport.

JULIE WARD

Julie Ward was elected as Member of the European Parliament for the North-West England region for the Labour Party in 2014. Before being elected, she was part of an international delegation to Belfast to discuss the role of the arts in the peace process and ran a social enterprise. She is an active campaigner for equal rights and social justice, and campaigns against violence against women, organising local events for One Billion Rising. Ward completed her Masters degree in Education and International Development at Newcastle University in 2012. She is also a member of Committee on Culture and Education (CULT) and Delegation for relations with Bosnia and Herzegovina and Kosovo.

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