
T-B A21 Lopud Seminar 2011
Black Swans – Producing the Improbable
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Discussion: *Mediatic Production and Dissemination of the Living Archive*

Tony Myatt (moderator), Marko Peljhan, Adrian Lahoud, Petteri Nisunen, Markus Reymann

Tony Myatt: I'd like to start today's session by giving you some sort of practical examples of things that we've been doing with the *Dardanella* project¹. I'm very pleased to welcome Markus Reymann, Marko Peljhan, Adrian Lahoud and Petteri Nisunen to the panel, who all have experiences in various different areas, which are quite related and will be informative for the formulation of the *Dardanella* project. We'd also like to open this up to as many people as possible, because I think there are a lot of open questions about the nature of the archive, the way in which it might behave, the way it might be used and the way in which artists might want to release their information, and scientists also, into the archive for people to use. And I think most of us who are involved in this project don't really know what the outcomes are going to be at this stage, so this is really an exploratory mission to begin the debate on how the *Living Archive* can come into being.

Most people probably have come across some of my work in relation to *The Morning Line*², but I just want to say a little bit about the context of that and how it relates to the work that we are proposing to do with Jana Winderen and Chris Watson and other sound artists making sound installations. In fact, quite a lot of my work is really a bringing together of pragmatic technologies, which are informed by different types of approaches, so writing about neuroscience and research in neuroscience and ecology in the sense of studying how organisms and objects behave in environments is very much part of informing how we – and in my research group that means the Music Research Centre at the University of York – look at spatial sound.

What we are doing on the *Dardanella* is focus on a technology called Ambisonics, which has been around for a long time and is a way of capturing a sound field. On the *Dardanella* we installed what is a very squashed and time-compensated sphere of a computer-controlled sound system that, once we've made surround-sound recordings, we can play them back within the space.

I've discovered that there's some very early military research that's not really documented, not really available, but I've found a couple of photographs of sensors which do capture surround sound underwater but the scale of these makes it pretty unmanageable for most artists working in

¹ *Dardanella* is T-B A21's research vessel, which embodies a new form of "project space" responding to the needs of artistic practices based on research and investigation of natural and scientific phenomena. For the project *T-B A21 A Living Archive: The Diversity Project* a critical mass of mediatic material and data is accumulated and stored intelligently during the journey of the *Dardanella* circumnavigating the Americas from 2011 – 2014.

² *The Morning Line* is a soundpavillon by Matthew Ritchie with Aranda\Lasch and Arup AGU, commissioned by T-B A21. For further information see: <http://www.tba21.org/pavilions/103?category=pavilions>

the field, particularly if you're chasing a whale or something of that sort. There are several devices of this sort around but there is not very much research that I'm aware of or that is published and currently available in the public domain.

For the *Dardanella* this summer we used a system which Jana did some experiments with, which uses a hydrophone. The small spot on the sphere is the tip of a very high-quality hydrophone, and the sphere changes the acoustics in response of that hydrophone, which would normally be sensitive to every sound around it, into something that is much more focused in one direction. We've subsequently been talking to the manufacturers of this type of technology, and we've started some working experimentation so that we can potentially make the first underwater surround-sound microphone in the style of the sound field of microphones. These are the sort of microphones that will capture the entire spatial information from the environment and the water rather than just specific sounds of individual animals. And we've begun to do some computer modeling and some practical experiments with small devices to test that we can make this microphone configuration work. When we put it into water all of these things get scaled up from golf-ball size to something which will probably be about a meter in diameter.

But on the back of making surround pieces, what we'll hope to do through this type of research is to come up with probably something we might call the *Dardanella* microphone, which will be a unique piece of equipment for capturing underwater sound fields that will be linked in to production technique and also into contemporary artistic practice. And that's the sort of aim, I think, for this type of product. This is one of potentially many, many types of projects that could go on on the *Dardanella*, but I think you see here there may be spin-offs that could occur for science and engineering and also different types of sound-art practice, too.

I will hand over to Marko now, because I know he has a very different experience of practical work in the field.

Marko Peljhan: Thank you. It's very interesting work you guys are doing in relation to the work that I've been involved in, mainly the Makrolab³ from 1997 until 2007 and now the Arctic Perspective Initiative⁴. Makrolab concentrated on creating an understanding of the global system, that is the complex of telecommunications, the electromagnetic spectrum and migrations. It contained the idea of observing migrations of people, animals, capital and so on. It is really understood in a very, very global and wide scale and also referring to weather and climate, which

³ Makrolab is an autonomous communications, research and living unit and space, capable of sustaining concentrated work of 4 people in isolation/insulation conditions for up to 120 days. The project started in 1994 and was first realized during an art exhibition, documenta X in Kassel in 1997.
<http://makrolab.ljudmila.org/>

⁴ The Arctic Perspective Initiative (API) is a non-profit, international group of individuals and organizations, 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. Its aim is to work with, learn from, and empower the North and Arctic Peoples through open source technologies and applied education and training. By creating access to these technologies while promoting the creation of shared communications and data networks without costly overheads, continued and sustainable development of autonomous culture, traditional knowledge, science, technology and education opportunities for peoples in the North and Arctic regions is enabled.
<http://arcticperspective.org/>

is maybe the one aspect that is most understandable to everybody nowadays, since we've been talking so much about climate in the last decade.

But we had a very specific problem when we developed the systems in the Makrolab and subsequent projects. A lot of the work was done through a mapping of the electromagnetic spectrum and of human-source telecommunications. We captured a lot of data and I must say that it was possible to sort of retranslate it and materialize it again through sort of performative means, because we are not scientists, we are artists working with this. Our methods were fairly technological, you could call them scientific. We used sort of converted military technology, a lot of interception techniques, decoding of signals and so on from very low frequencies – so we'll have submarine communications – to very, very high frequencies in the microwave area up to the K-band.

And our problem was always that the amount of data that we've been gathering was much, much larger than the amount of processing power we sort of were capable of corraling together within the project, within Makrolab. So there's still, I must admit, hard disks full of stuff that hasn't been processed yet, because there was no capability within our rather small operation, I'd say. So, that was one of the experiences that we had, but I tried to open with Makrolab really a lot of research directions, like you do, for example with designing this sort of very special hydrophone.

There's still a lot of stuff that is classified, and the same goes for telecommunications interception, and when you go into cryptography that's another sort of planet, of course. For the record, we have not been able to crack some very, very good encryption, but some simple ones, yes, because it's known how they are done and they are not super secret. Mostly it's coded stuff anyway, but we've managed, for example, to monitor the Inmarsat satellite system when it was still completely analog – this was in the 1990s up to 2001, Inmarsat A and Inmarsat B. We were able to capture Inmarsat, sometimes, if we were lucky, both channels, sometimes just one side of the conversations and faxes. We monitored, for example, the U.N. operations in Sierra Leone during the crisis. That was a very, very large long-term work that went on for two months, and there's a huge archive. And what we did with this archive is creating a record out of it, but you can download it online, too. It's called *Signal Territory*⁵. There is a silence of 20 minutes on the record, and after the silence we actually published the sources. So you can listen to these conversations from which the sound work was done, and you can understand what the context was.

It turned then into performative practices, where we set up these large performances that would last for a whole night, usually, six hours, seven hours, eight hours, and we bring all of our equipment and it's sort of a large all-night sound event, but it's all live signals. We work with them and decode them, visualize them, show them and so on. We used radar for these purposes too and so on, so really everything that we could get our hands on.

The problem with our sort of outcome was that it is still an aesthetic experience, but there is this large body of data that has also a lot of scientific potential. We didn't work with scientists also because of security reasons and so on. I mean, each time that performances happened and whatever we did, it was technically illegal wherever we were, except in Australia. Australia has

⁵ <http://www.rx-tx.org/?p=6>

very specific telecommunications-interception laws. One part of the problem is that this large data body can have very, very strong aesthetic materializations, but on the science side there's usually not enough manpower. We also built our own instruments, our own sort of configurations of receivers, some antennas and a very, very fast positioner for satellite and so on. The development of technology goes hand in hand towards sort of these goals, especially when you use them for artistic purposes, when you don't have the resources of a large group of engineers working with you.

TM: Were you gathering data that was specifically tagged with this idea that this could potentially have scientific use one day?

MP: If you would understand the complex field of human telecommunications, migrations, weather and climate and you would do a computational merging of all of these three fields, you would get a very, very complex picture of the global system, and that's still the idea. Nowadays, slowly, also with all of the citizen science projects and so on or projects like the *Dardanella*, there is a threshold that we passed, where we can computationally start to bring these data together on a global scale, finally, and see what can happen.

TM: I mean, just to be potentially controversial for a second, isn't there something arrogant about artists saying, "Well, there will be scientific interest in this data at some point in the future, maybe"? I mean, why would there be?

MP: I don't know. Scientists are interested in data. Nowadays we have, as far as I know, one standard for a common data format, the CDF. It's published by NASA and it's 60 pages and it's a horrible sort of idea of an open data format, so nobody really uses it. But I think we have to get there and, no, I don't feel it's arrogant. Why? It is the same as if a scientist was arrogant if he or she concentrates on one very, very narrow field and that's all they do?

TM: I just wonder if I could turn to Adrian, because you have experience of projects which engage with communities and geography and you did some particularly in the Mediterranean.

Adrian Lahoud: Sure. Just before I talk about myself, I just wanted to mention something very interesting, which I remembered from a presentation in Beirut. There was the person who set up the mobile telephone system in the occupied territories. It's a fascinating story, in which he talked about this kind of territorial conflict, right, on the land, but also a kind of electromagnetic conflict as well.

And the fight at the time was where you would set up the receiver stations. So they were trying to get the Palestinians to move into an international roaming charge when they crossed into a space that is disputed. There's kind of network switching, which I thought was extraordinary. Suddenly there's almost like a mirror of the conflict on the land but in the electromagnetic spectrum, and then I thought, well, this thing that you talked about in Australia, which I didn't know about, is extraordinary, and maybe in a way that's one of the things you discovered in the project. Maybe that's the most important piece of data.

The work I do for about four years has been researching cities in the Middle East. It's part of a larger project, in which we're mapping very systematically over the next four years different cities along the shore of the Mediterranean, so we started off in Beirut. We looked at Tunis and Tripoli. At the moment my students are in Venice and Trieste, and it's important, I think, for me, because the sea historically has been a crucible, not just of discontent and conflict, but also of cultural exchange in general.

So, the next four years of the work we're really just deciding on a list of cities that we're gonna start researching, and it's a large project. We collaborate with all sorts of institutions across the Mediterranean, also people like Eyal Weizman. And the research work takes place at a number of different scales. At the moment at the scale of the basin we're also putting together – I guess you could call it an archive, in a way – a series of indicators trying to understand how the Mediterranean operates as a system. We are looking at things like tourism flows, migration, also energy resources and energy projections. As you know, both of those things are very contested at the moment, so Europe essentially conceives of the Mediterranean as a kind of police condition and as a kind of fortress against migration from the south, from North Africa. The two most policed waterways in the world are currently the area south of Spain and Lampedusa in the south of Italy as well. And, of course, energy is also becoming increasingly important. North Africa is conceived as a kind of resource of renewable energy, obviously solar energy, and, of course, there are these very large pilot projects, which are starting to take place in the north of Africa.

What we're trying to map is this kind of sense of disparity or inequality between these different regions in the Mediterranean, and there's quite a lot at stake, I think, in the project, in that the future for the South, for the Middle East, can probably go in one of two ways. One of those might be the production of a civil society, a kind of cohesive, creative culture. Another one might be increased inequalities, social stress, violence, extremism. I know given what's happened recently with the Arab Spring, I think there are probably very good – well, there're probably some very optimistic signs that are already starting to show themselves, but importantly for us it's actually the city and these cities on the shore of the Mediterranean, in which these things will manifest themselves, in which they'll show their face. So the city is somehow the battleground in which these inequalities are gonna play out.

I'll very briefly talk about some of the research principles that we use when we visit these places. Obviously it's quite politically sensitive. I think we've spent a lot of time going through understanding how to structure the research in an ethical way, and I think one of the most important things that we do is we will never visit and do research in a city unless there is opportunity to kind of expose ourselves to collaborators in that city and actually just present the research to them in a very open way and invite critique.

TM: Are those people also working in the area that you're working? You're not talking about sort of general public presentations and dialogues with anybody?

AL: No, not at all. The first thing we do is a lot of historical research. We need to know the history of similar projects in those cities as well and how they've played out, what the proposals were, why they failed. This is all in context of urban design work, of course, and we speak to our contemporaries, our peers, in those cities. It's really about having our position reflected back with

someone who has local knowledge. Another principle is that the work is always publicly available, so we publish books, so there's one coming out next year, in which we're collating all this information and then it goes back into the public domain, so that's critical.

TM: I was quite interested in the scale of that sort of project. I mean, could you say something about how these things are set up and what sort of lead times you have on them and what sort of realization times you have, because obviously – we were talking in an earlier panel about the scale of projects and value of potentially long-term projects in the short term.

AL: The scale question is critical, and one of the things that we try to do is not to be comprehensive, because it's impossible, and I think this is one of the things that is coming up for me listening to a lot of these presentations as well is we're not very interested in trying to collect all the information or to acquire huge masses of data, and I think we have quite a different working process, in which we're not trying to cover everything. We're just trying to be very selective and construct an argument.

So, the work that we look for is really to help us to discover whether the research question is being posed correctly to begin with, but then also to just construct an argument about what's happening in a city. So, in a way, we're looking for evidence to support the argument, and so what that means is that you don't need to know everything, but you need to capture the salient characteristics that will help support whatever argument you're making in the relevant city.

Now, in terms of scale, I think there's two ways of talking about scale. One is spatially, so actually literally the sort of how large or small the area is that you're studying, and then also in terms of durations. So, obviously some research formats are very short and intense, maybe like this conversation, but then other research formats really take years and years and years to acquire consistency. I think one of the things that I did very early with the project was to map out all the different formats of research or inquiry that were possible, so things like a seminar like this, a workshop, a design studio in a university, which might go for 15 weeks, but then also a sort of 1-year research program in a university, then something like doctoral research.

And it's just to understand this kind of ecology of different events and how they can feed into the research, because each one of them is capable of addressing a different sort of question. And then similarly, in relation to the spatial scale it was also important to try to not be comprehensive but to pick an object at a very small scale, pick something at a kind of block scale, pick something at a city scale and then pick something at a territorial scale and actually try to understand it in the links that take place across those different registers.

TM: I'd like to maybe bring Petteri into this discussion here. One of the things that kept coming up during discussions between Chris, Jana, I and various people on the *Dardanella* about the idea of an archive was that artists rarely focus their practice on collaboration. But you are somebody who collaborates a lot and presumably sharing data and being open with sources is very much part of that, I just wondered if you could say something about your experiences at collaboration.

Petteri Nisunen: Tommi [Grönlund] and I, we collaborate all the time with our work, but we're constantly also collaborating with other artists. I was thinking yesterday when I was talking to

Jana about these recordings, about sharing data that scientists are more flexible with the data or that it's more like something you just produce and then it can be used in different ways. For the *Dardanella*, I think it would be interesting also to include artists who are not on board themselves but they could sort of create something collaboratively.

TM: I'm wondering if we could turn to Markus, who has been working very closely with *Dardanella* thinking about how data should be captured and recorded and also coordinating with a lot of the recordings of interviews and conversations that have taken place in *Dardanella* and is intimately involved in thinking carefully about the database and how it's gonna work.

MR: On the *Dardanella*, photographs, videos and the ship's data are gathered every hour. So the ship's log contains your location, wind strength, wind direction, swell, how high the swell is, where the swell comes from. It contains sea temperature, sight, stuff like that, and then every hour and a half there's also an engine log, where the engines are checked, the revs, all of that. The generators are checked, temperatures, so you generate as it is there already a lot of data. Then you have the different recording artists, and this is just the pilot project, where you had two artists plus Tony working on one field, so it's a very specific data that is collected there and also the documentation of the whole thing, which is shot on two HD cameras. Then there are different photo cameras running, so we gather a huge amount of data every day, which brought us to just the problem: How are we gonna deal with this data? We wanted to build up an archive that was interactive, not only for the people that are on board but also people that are on land. People that were on board still want to work on their projects when they leave the boat.

So, this brought us to a different question: How are we gonna handle this data? Since we wanted it to be a conversation, a dialogue, we in the beginning thought about having an open archive. Everybody can access the archive. Everybody that is interested could access it and navigate through the archive. But how are you gonna structure it? Obviously this is just a technical question, but there is also the artistic ownership. What we're working on right now is to create an archive, which is closed to the people that are working on the project or people that want to be related to the project. We also decided to have a public website, which is an edited version of the archive, more or less. So, that means you use the archive as a workstation, either on board or from where you are, and then you can – whenever you're ready to publish something, you send it off to the website and it's published. This gives people the chance to actually follow us, follow what we're doing, so this is gonna contain maps where we are, samples of works that have been published but also the documentation that is going on every day.

TM: Just to come back to this issue of having this huge amount of data and how one might get the head around it or utilize it. Adrian, you were talking about very specific projects that were focused in a particular area to answer very specific research questions, which in a sense is a sort of antithesis of what's been described in this archive. I mean, is there any way that these things can come together?

AL: It seems to me there is actually, in a way, two different research models. One is this idea of a platform, which is clearly the one that you're interested in. The way I think about research is obviously quite different. It's more something that cuts something, rather than something that supports, but having said that, I'm kind of seduced by the possibility of having a more live, in a

way, body of information. I think it's kind of a very interesting possibility. For me, I'm not sure what it means in terms of my own work here.

MP: And I'm seduced by cutting, this idea of actually sort of posing a very, very concrete research question, which is something that probably will also happen with the *Dardanella*. Makrolab had this kind of total utopia of finding a global answer, which of course already in the beginning it's quite clear it's not gonna get there. Whereas here there's a very, very good chance, since the project is in its sort of start, to define maybe some specific questions that then you follow very precisely.

AL: There's a really interesting Iranian philosopher, Reza Negarestani. He has a really beautiful model, which I like, and it probably fits in with some of these things, which is a tuning fork and a razor blade. And so the tuning fork is the thing that allows you to somehow lock into the right frequency or to the right thing – to discover something, but a very specific thing. And then the razor blade is the thing that you use to cut it out, so I think that's kind of, for me, a nice model of the way I work⁶.

TM: There's a potential here to take various different practices, ones that are very research-focused and led by research questions but maybe bring into play all of the things that go on that are rejected from that process or that are gathered simultaneously with that process but don't actually become part of the product. If you like, the data that's not used exactly to draw the conclusion of a particular research question, or, for example, the material that Jana might not use in a work of art for aesthetic reasons, but it still actually has some value for scientific people who want to know about particular sea condition or something of that sort.

AL: And this goes back to the issue of what you were talking about with hearing in that the tuning fork is intention, and intention is somehow always the thing that drives your attention to specific things. So, I think you're maybe asking a very difficult question of yourselves, which is to somehow not reduce the possibility of this thing before we start it, but I'm not sure. I mean, it's a nice idea. It's incredibly generous, but it's difficult in a sense.

TM: I think we've arrived at a moment when we can maybe introduce Adam Bly into the conversation here who is very much engaged with contemporary data visualizations. Some of us have been fortunate enough over a number of years to have seen the work that Adam's done and pulled together in very new areas of scientific investigation. It was never always clear that this type of activity was possible and productive in science, but through doing visualizations of data really meaningful insights have come to science.

Adam Bly: I think what we've tried to do with this project with visualizing is to kind of bring design into the equation, and admittedly there is definitely a field of data visualization which is more artistic in nature, and then there is a field of data visualization which is more design-oriented in nature. I'll show you a couple projects from visualizing that are more artistic in nature, where there's an attempt on the part of the creator to use aesthetics with design in new ways, and those

⁶ see transcript of lecture by Reza Negarestani in: Mackay, Robin (ed.), *The Medium of Contingency*, Ridinghouse, London, 2011.

aesthetics are actually contributing new insights about complex systems. In other cases, the form is, let's say, less novel, and it's really more about the data and just applying design practices to the data to arrive at new understandings about a system that we couldn't understand before. Really this is an open community, so everything here is under creative commons, and the goal is really to connect data with the design community so we can really arrive at some of these sort of amazing projects.

The question used to be what can we now see, and for the first sort of couple of years of this emerging domain, it was really just about applying interfaces to huge data sets. And I think in many respects that's still very interesting, just recognizing that we can now see different things. We could see systems interacting with one another. We could see interactions among different nodes or agents within a system and we could just apply form to things that before didn't have form. But to us, frankly as scientists, we're much, much more interested in what we can now know, so are there insights that we can now glean about particular systems in the world that we just couldn't understand without applying design to them? So, one is being enabled by the data and then, secondly, being visualized through design.

[presentation of selected projects on data visualization]

I think one of the other interesting things is how designers and artists are now starting to connect things, and that's a huge opportunity. This is connecting, for example, biodiversity with the ecological footprint of an environment. This is connecting green space with public health, so all of these just interesting new connections of data sets that the tools enable, the form enables now, and designers are starting to think what's the appropriate form to give to that data to better understand the kind of connections that we're seeking to understand?

TM: Thank you very much. I mean, there are clearly a lot of data sets, a lot of different visualizations that look at this meta-level of data access. Have you come across any visualization process that work on a more specific scale, I mean, something, for example, that's like the *Dardanella*, has some sort of geographical basis to the data set or some unique attribute rather than being mass-data'd?

AB: Because the data has a kind of universal quality to it in that there is either location coordinates, there is days, there are times that allow you to simply connect that data to other. It would be fascinating for me to connect the data of *Dardanella* to *Sorcerer II*⁷, because it is looking for completely different things but we can connect it just based on geography.

⁷ Inspired in part by the voyages of H.M.S. Beagle and the Challenger Expedition, as well as the results from the Sargasso Sea sequencing pilot project, the Sorcerer II Expedition began in August 2003 in Canada in Halifax, Nova Scotia on a year and a half long global sailing voyage of discovery. As the Sorcerer II Expedition circumnavigates the globe, the scientific team will explore marine and terrestrial community microbial biodiversity using sampling and analysis methods developed during the Sargasso Sea pilot project. As the team samples the waters approximately every 200 miles, the goals are to discover new species; to better understand microbial biodiversity; to discover new genes of ecological importance; and to establish a freely shared, global environmental genomics database that can be used by scientists around the world. <http://www.sorcerer2expedition.org>

In other cases it is about a complete system. If *Dardanella* has the capacity to acquire data on multiple different facets so not just ecological and not just biological and not just sound, not just cultural, not just whatever, linguistic, the capacity to aggregate that data in a systemic way is quite fascinating, because I think that there are, in fact, very few projects that have the capacity to aggregate data on multiple different kind of dimensions of any system and then be able to contrast it and see how things are related.

So there is the dimension of connecting *Dardanella* to other projects based on common coordinates or common axes. The other is looking at the complete system and using that as a basis to study systems.

Bruce Ferguson: I understand that science and art are meeting on this visualization-technologies area and platforms, but, for instance, two years ago with more data than anyone's ever had in the history of the world, 18,000 professional economists in the United States were wrong, and it strikes me that that's because there was – the data isn't enough, that there have to be certain assumptions in the analysis prior to the data in order to provide an algorithm that is useful. So, I'm interested in the usefulness of data that is based on certain assumptions.

AB: The challenge here is that we have – the economic crisis that you alluded to, the absence of understanding of the data and the algorithms that went into frankly causing – not just supporting but causing the crisis is very much a result of our lack of collective scientific and information literacy when it comes to these underlying data sets or what it is that we're measuring. We have algorithms controlling many of these systems and an absence of collective peer review about these algorithms that are being used to determine many different functions in the world. I think that part of what this kind of domain is affording us is a collective sense of transparency into this data. There's efforts now. One is just actually giving us all the access to the data and be able to apply visual form to it, because it's the way that we can collectively start to see things. We could start to see things change. We could start tracking things. There's now dashboards. There's all sorts of efforts to just put the data out into a broader public domain. I think that's good. I think that's just about democratizing the information, and I think that's a good thing and I think that's a contrast to where we were.

The other aspect, though, is the algorithms themselves, and this is not just a matter of collective information literacy. This is about applying different fields of practice to the construction of those algorithms. Historically those algorithms were being computed by economists. There's certainly science going into it, but there's an absence of the ability for other domains to participate in these kinds of efforts, and we just simply – they become so complex that no other domains can participate or disciplines can participate in the discourse. The capacity right now is to kinda blow that up and enable more participation in the construction of these algorithms, more visibility into the algorithms, more actually understanding of the data science that's going into it before they become the algorithms that run complex systems in the world.

So, this is all part of an effort. I think the bigger trend here is opening up the data, opening up the tools to visualize the data, opening up the algorithms to peer review, frankly just becoming more literate about data science. And I think that's the effort that is under way right now, and we're seeing proof of concepts, where insights are actually being derived as a result of these analyses.

TM: Adrian, do you want to come in on that?

AL: I just wanted to say that the sense somehow that if the science were better the financial crisis would've been avoided is actually just incorrect, because these things are illogical and they're political and they're not – the market, the weather, cities, all these things are mediums of contingency, and maybe contingency is a theme that is kinda circulating in the background of the conference. And the thing about contingency is that you can have all the information in the world, but it doesn't make a difference.

Skylar Tibbits: I had a potentially interesting idea to take that a step further, and I think it relates to a few different discussions happening. If you take this data visualization, let's say, there's good examples about how you could apply that to a physical system and get the feedback. There's, I think, a plant scenario, where there's information extracted from the soil or extracted from the plant so it self-feeds itself. When it's thirsty the plant feeds itself, so it'd be interesting to connect some of the data visualization to physical or environmental scenarios that could feed the visualization that could then feed the physical. And I think for, let's say – *The Morning Line* is a good example. How could the sound influence the physical structure to change as well, not just taking information out, or the boat, the *Dardanella*? Could the information you're extracting inform the sea life itself maybe where more food is or something. You're extracting and you're taking out. There's art, but you're also changing the physical.

TM: Sure. I'll take that. I mean, that's something we haven't considered yet.

Alisa Andrasek: Could I just add something, because Adrian brought up contingency, so I have to jump in, because I had this very interesting conversation with the Iranian philosopher Reza Negarestani on contingency that actually is not computable. And obviously I'm someone who also heavily works with data and computation, and I think I would like to connect this point to the earlier point about the kind of cut versus the total sort of system or working with data in the more kind of aural way. And I think there is a way to combine these issues, because what Adam was showing are different systems that can suddenly start to show certain symptoms, let's say, of a situation, so it's not a total situation but it's a really kind of, in my mind, evolving valuable kind of entities that are informing the situation, whether we are talking about current politics in northern Africa or any other issues.

So, this idea of open synthesis, which Reza and I are kind of working on quite a bit, and a cut, where you can actually channel some of these small universal models, including evolving algorithms, because with every next – maybe you develop algorithm for one problem or within one host condition and then it migrates into another. An algorithm learns as well as that problem, so I think it's a kind of evolving – these are evolving systems, so it's a danger to understand them as a kind of totalitarian answer but more of something that kind of grows through the exposure to complexity but the idea that actually the kind of complex contingency's computable I think I'm not even sure it's possible, but that doesn't mean that it doesn't have a value.

MP: It's a very interesting discussion, but I will sort of jump back to *Dardanella* a little bit, because yesterday we talked about how *Dardanella* can avoid getting into specific kinds of traps, and we

had also an answer that it's unavoidable but that you sort of have to – the project has to embrace them. Well, today's discussion maybe brought us one step forward, which might be a potential answer of how to sort of evolve the project through also to say – through the idea of the archive and sort of look at *Dardanella* as a feedback system, which creates enormous amounts of data that feeds back into sort of the – let's call it "algorithm" for the simplicity of the discussion.

That sort of guides the mission of the project; therefore, maybe one of the things that should be considered is if this kind of precise or semi-precise navigational time plane, which exists and is the first sort of projection of, let's say – or it's trying to repeat an old colonial matrix is the one that should be subject of this algorithm. And *Dardanella* is sort of guided by the data and the products – the projects that it produces, and it's sort of – its navigational, physical presence in this world is guided by the projects themselves; therefore, the navigation somehow stops being predetermined but it becomes something much more dynamic. Just a thought.

FR: Just one thing like these algorithms and this justification of data. To work with it you have to find some classifications of it, but I'm not sure what the classification is here now, but they all seem to me to come from this Western civilized background, so a classification system of an African or an aboriginal would be completely different. So these people can't actually use this. How can they use this? It's a classification system that would not apply. It doesn't apply to their life.

TM: No, it doesn't. It was never intended to.

FR: So this collection of data is not a globally used?

TM: No. Nothing is globally used. But think of this in terms of the *Dardanella* project. One of the things that you were suggesting, Markus, was that it is for a small group of people initially in the sense that what is here is an opportunity with certain resources, certain capabilities or certain predetermined geographical tracks and so on, which means that fellows are the primary interacters. A small body of researchers become the people who interact.

MR: That is partly true, but as Fionn [Meade] mentioned yesterday there's also the opportunity or the possibility of interacting with already grown structures on land, which you communicate to, you support, and then maybe you have the possibility whilst you're passing by to showcase these structures that are already there. So it's not only the small – and this is an important fact that it's not only the small group, handful of people that are on board researching, actually being able to use all the applications that are on board and all the facilities that the board – or the boat gives to them but also to feed into and to support and showcase already grown structures that are – obviously they need to be researched before but that are already existing. So it's not only just new data that is – or new work that is constantly created on board, but there's also the possibility of supporting ongoing processes on shore.

TM: But the application of the data is something that emerges from the practice that takes place on the boat?

MR: Yes.

Jana Winderen: I was just thinking about an example of the film that you showed where I was testing the hydrophones and the result that I came to, which wasn't on the film, but the result was actually wrong, because one of the hydrophones wasn't functioning properly. So, it's just an example that if the information that I found got spread very quickly before some time has gone and we can look into the data or the recordings or whatever that we are collecting – I just think it's important that we have the time before it spreads. I'm all for sharing everything, but just like any data that too quickly gets spread online it can get interpreted wrongly. I mean, that was just a very small example, but generally I think it's a huge problem at the moment.

And another thing, which is something I thought about in terms of passively collected data. You put a buoy out with a hydrophone, for example, and you receive over satellite or whatever or you pick on the Internet a sound from us. And it's a different thing than the more actively collected data, where if I then call sound recordings "data," which it is, but there's also the action of this recording composition, and those are the material from our trip, and with *Dardanella* it's just listening or more passive collected data, but sometimes there are more active collected data, which is then composition. So, that's my point, but I think it's just a really, really great idea to share and be part of a larger project. In this way as one artist you can kind of contribute to the whole larger understanding and sharing of the knowledge.

TM: I think it's clear there're a lot of open questions here relating to the archive and its use and its function and its relationship to other archives and projects and artists' practice and so on and so forth, and I'm sure that over the course of the next few weeks we won't resolve all of those issues, but this has been a very interesting beginning, and thanks everybody for the contributions from the floor and thanks to everybody in the platform for their really important contributions to the debate this morning. Thank you.

BIOGRAPHIES

Adam Bly

Adam Bly is the founder and CEO of Seed Media Group, an integrated media and technology company committed to helping advance science and its potential to improve the state of the world. Adam began his career at the age of 16 as the youngest researcher at the National Research Council of Canada, where he spent three years studying the biochemistry of cancer. Following his time in the lab, Adam set out to launch Seed, a new type of science magazine for our times – tag-lined “Science is Culture” – with the mission of raising scientific literacy. “The best comparison for Seed,” wrote a media critic, “is the early years of Rolling Stone, when music was less a subject than a lens for viewing culture.” Under Adam’s leadership, Seed received two National Magazine Award nominations, for Best Design and General Excellence, the magazine industry’s highest honor. Seed’s success has since led to the development of new brands, platforms – from software to data visualization – and markets – from Europe to Brazil. In 2007, Adam was named a Young Global Leader by the World Economic Forum. He is a recipient of the Golden Jubilee Medal from Her Majesty Queen Elizabeth II and his achievements have been highlighted by former Canadian Prime Minister Jean Chrétien, “for showing people the scope and power of science not just as an object of study but as a key to understanding the world around us.” He has spoken around the world on the future of science and its role in society, most notably at the World Economic Forum (Davos), the STS Forum (Kyoto), the U.S. Department of State (Washington), the Royal Society (London), the Chinese Ministry of Science and Technology (Beijing), the Academy of Sciences for the Developing World (Mexico City), the National Academy of Sciences (Washington), and the Museum of Modern Art (New York), and at universities including MIT, Harvard, Columbia, McGill, and Peking. He has served on the nominating committees and juries of the Buckminster Fuller Challenge, Technology Pioneers, the Earth Award, and the TED Prize, and sits on the Science Advisory Committee of the World Economic Forum, the American Committee of Israel’s Weizmann Institute of Science, the Communications Advisory Board of the National Academy of Sciences, the World Economic Forum’s Global Agenda Council on the Future of Innovation, and OECD’s Global Project Board on Measuring the Progress of Societies. <http://seedmagazine.com/>

Adrian Lahoud

Adrian Lahoud is an architect, urban designer and researcher. Through private practice, teaching and doctoral research, he explores the disputed, conflicting and often paradoxical transformation of cities. He has been invited to teach, lecture and work as a guest critic at the Architectural Association London, American University of Beirut, Institute of Architecture University of Applied Arts Vienna, Royal College of Arts London, TU Berlin, UdK Berlin and ETH Zurich. His PhD *The Life of Forms in the City* explores the problem of scale and complexity in architecture and the city. A regular contributor to both academic and mainstream architectural publications, in 2010 he edited a special issue of Architectural Design titled *Post-traumatic Urbanism*. Forthcoming in 2012 are two books: *Project for the Mediterranean* on speculative transport, energy and media infrastructure in North Africa, the Middle East, and southern Europe, and *Spatial Organization in Architecture and the City*, a diagrammatic analysis of experimental architectural and urban design work. His professional experience has moved across a broad range of scales and disciplines including architecture, art, urban design and landscape. Most recently his work has been exhibited at the Prague Quadrennial (2011) and in Korea at the Design Biennale Gwanju (2011)

curated by Ai Weiwei. In 2003 he established an award winning private practice. Currently, he is Course Director of the Master of Advanced Architecture in Urban Design at The University of Technology Sydney.

Alisa Andrasek

Alisa Andrasek is an experimental practitioner of architecture and computational processes in design. In 2001 she founded *biothing*, a trans-disciplinary laboratory that focuses on the generative potential of computational systems for design. In 2005 she initiated *CONTINUUM*, an interdisciplinary research collective focusing on advanced computational geometry and software development. Andrasek graduated from the University of Zagreb, and holds a Masters in Advanced Architectural Design from Columbia University. She has taught architecture studios and theory seminars at Columbia University, the University of Pennsylvania, Rensselaer Polytechnic Institute and Pratt Institute, and has lectured at architecture schools in the U.S. and internationally. Andrasek was co-winner of the Metropolis Next Generation Design Competition, 2005 and received the FEIDAD Design Merit Award, 2004. Recent exhibitions of *biothing's* work include: *Scripted by Purpose* at the F.U.E.L. gallery in Philadelphia 2007; *Maison Rouge* gallery in Paris 2007; *Ars Mathematica* in Paris 2007; the 2003 Prague Biennale; the 2004 Sydney Biennial; Architectural Biennial Beijing 2004 and 2006; the Museum of Contemporary Art in Trento (MART); and the New Museum of Contemporary Art, New York, 2005. She co-curated the exhibition *Emergent Talend Emergent Technologies* for the Beijing Biennial 2006 and *PROTO/E/CO/LOCICS: Speculative Materialism Symposium*, Rovinj Croatia. www.biothing.org

Bruce Ferguson

Bruce Ferguson is dean of the School of Humanities and Social Sciences, American University in Cairo. Previously, he was founding director of Future Arts Research and professor at Herberger Institute for Design and the Arts, Arizona State University, Phoenix. Ferguson served formerly as dean, School of Arts, Columbia University, New York; president and executive director of the New York Academy of Art, and is founding director and first biennial curator of *SITE Santa Fe*. Ferguson has curated exhibitions for institutions such as the Louisiana Museum of Modern Art, Copenhagen; Barbican Centre, London; Vancouver Art Gallery; and the Institute of Contemporary Art, Boston. He also organized exhibitions in the international biennials of Sao Paulo, Sydney, Venice and Istanbul. He has served as curatorial consultant for the Vancouver Cultural Olympiad (2010); Albright Knox Art Gallery, Buffalo; and Art Gallery of Ontario, Toronto. Ferguson has written for *Canadian Art*, *Artforum*, *Art in America*, *Flash Art*, *Bomb Magazine*, *Art Press*, *Border Crossings*, and *Parachute*, and is co-editor of the seminal textbook anthology *Thinking About Exhibitions*. (Routledge, New York, 1996).

Florian Reither (Gelitin)

Gelitin is comprised of four artists (Ali Janka, Florian Reither, Tobias Urban, Wolfgang Ganther). They first met in 1978, from 1993 they began exhibiting internationally. Recent solo exhibitions include: *Lucas Bosch Gelatin*, Kunsthalle Krems, Austria (2011), *Gelatin Pavilion - Some Like It Hot*, Biennale di Venezia, Venice (2011), *Frohes Fest*, Belvedere, Vienna (2010), *Blind Sculpture*, Greene Naftali Gallery, New York (2010), *Klunk Garden*, Tomio Koyama Gallery, Tokyo (2009), *La Louvre Paris*, Musée d'Art moderne de la Ville de Paris, Paris (2009). Their recent performances and lectures include: *Andreas Schlaegel and Gelitin - Come early to avoid disappointment*,

T-B A21, Vienna (2011), *Mode statt Hode - gelatin defiliert Modeklasse Bernhard Wilhelm*, Galerie Meyer Kainer, Vienna (2011), *All or the Just – I 120 minuti di Torino*, Teatro Regio, Turin, Italy (2009), *Boring Island*, Mossutställningar, Stockholm, Skärgård, Sweden (2009), *Yes OK Ex*, Rochelle School, London (2008). www.gelitin.net

Jana Winderen

Jana Winderen is an artist educated in Fine Art at Goldsmiths College in London, and with a background in mathematics and chemistry from the University in Oslo. Since 1993 she has worked as an artist, curator and producer. She currently lives and works in Oslo. Jana Winderen researches the hidden depths with the latest technology; her work reveals the complexity and strangeness of the unseen world beneath. The audio topography of the oceans and the depth of ice crevasses is brought to the surface. She is concerned with finding sound from hidden sources, like blind field recording. Her most recent sound works include *Survivors of the Waterworld – measuring pollution by sound* for Göteborg international biennial for contemporary art, Energy Field live at ARS Electronica Festival for receiving the Golden Nica, *Energy Field Installation* and *Scuttling around in the shallows* for Galerie B-312 in Montréal, Canada, 2011 and for The Project Issue room, New York 2011, *Between Dry Land*, commissioned for the installation *The Morning Line* by Matthew Ritchie for the Thyssen-Bornemisza Art Contemporary which opened in Istanbul May 2010. The commission *Spawning Ground - from Coquet Head to the North Sea* for the AV festival in Newcastle (2010), *Evaporation* (2009) at Today's Art festival in The Hague, Netherlands; *Sub Pelagic Voices* (2009) for ISCM World New Music Days, Sweden, *Colonizers of the undergrowth* (2009) at Botanic Sounds in Göteborg and *North Atlantic Drift* (2009) for JunKroom in Kyoto, Japan. Recent releases include the album *Energy Field* (2010) on Touch, *Heated: Live in Japan* (2009), on the same label, the audio cassette *The Noisiest Guys on the Planet* (2009) on Ash International (UK), the USB stick, *Ants*, the digital download *Submerged* (2009) on Touch and the 7 inch vinyl *Surface Runoff* (2008) on Autofact (USA). She is currently working on a commission for a permanent sound installation at the Knut Hamsun Centre in Hamarøy, Norway. Jana Winderen is published by Touch Music [MCPS].

<http://www.janawinderen.com/>

Marko Peljhan

A native of Slovenia and a theatre and radio director by profession, Peljhan founded the arts and technology organization *Projekt Atol* in the early 90s and cofounded one of the first media labs in Eastern Europe, *LJUDMILA* in 1995. In the same year, he founded the technology branch of *Projekt Atol* called *PACT SYSTEMS* where he developed one of the first Global Positioning Systems based on participatory networked mapping projects, the Urban Colonisation and Orientation Gear 144. He has been working on the *Makrolab*, a unique project that focuses on telecommunications, migrations and weather systems research at the intersection of art and science from 1997-2007, the *Interpolar Transnational Art Science Constellation* during the International Polar Year (project 417). Peljhan is currently coordinating the *Arctic Perspective Initiative* art/science/tactical media project focused on the global significance of the Arctic geopolitical, natural and cultural spheres with Matthew Biederman. Peljhan has also been the flight director of ten art/science parabolic experimental flights in collaboration with the Microgravity Interdisciplinary Research initiative and the Yuri Gagarin Cosmonaut Training Centre, creating conditions for artists to work in alternating gravity conditions. He is the recipient of many prizes for his work, including the 2001 Golden Nica Prize at Ars Electronica together with Carsten Nicolai

for their work, *polar*, and the UNESCO Digital Media Prize for Makrolab in 2004. During 2008, Peljhan was appointed as one of the European Union Ambassadors of Intercultural dialogue. His work was exhibited internationally at numerous biennales and festivals (Venice, Gwangju, Brussels, Manifesta, Johannesburg, Lyon), at the documenta X in Kassel, several ISEA exhibitions, several Ars Electronica presentations and major museums, such as the P.S.1 MOMA, New Museum of Contemporary Art, ICC NTT Tokyo, YCAM Yamaguchi and others. Since 2009 he is one of the series editors of the *Arctic Perspective Cahiers* series (Hatje Cantz). He holds joint appointments with the Department of Art and the Media Arts & Technology graduate program at the University of California Santa Barbara and was appointed as Co-Director of the UC Institute for Research in the Arts in 2009, where he is coordinating the art/science Integrative methodologies initiative.

Markus Reymann

Markus Reymann (1976, Wiesbaden / Germany) studied acting at the Hochschule für Musik und Theater in Hamburg. Throughout his career, he took on acting assignments at Thalia Theater and Deutsches Schauspielhaus in Hamburg as well as Theater Basel and theaters in Potsdam and Bremen. He also played roles in a number of film and TV productions. Most recently, he was cast for the production of *Scratching on Things I Could Disavow: A History of Art in the Arab World*, a work by Lebanese artist Walid Raad, co-commissioned by Wiener Festwochen and Thyssen-Bornemisza Art Contemporary. He is currently focusing on the T-B A21 project *Dardanella: A Living Archive*, visually documenting the various legs of the maritime journey and working on the development of the Living Archive.

Petteri Nisunen & Tommi Grönlund

Grönlund and Nisunen have worked together as an artist-duo since 1993. Their works are mainly site-specific installations which often use sound, light and kinetic elements. Their work has been shown internationally in several galleries, museums and art centers, including Musée d'Art Contemporain, Paris; P.S.1, New York, Museo Rufino Tamayo, Mexico City, Rotterdam Kunsthalle, Dundee Contemporary Arts, Hamburger Bahnhof, Berlin and Moderna Museet, Stockholm. They have participated in biennials and triennials in Venice, Yokohama, Gothenburg, São Paulo and Moscow. Their work is represented in different collections and they made permanent public installations for Finland, Sweden, Norway and Denmark. Grönlund and Nisunen ran the architectural practice *a.men architects*, in Helsinki together with three other partners for several years. Besides their art practice, Nisunen runs his own architecture office and Grönlund runs his music label *Sähkö* which released over a hundred records over the years. <http://g-n.fi/>
<http://www.sahcorecordings.com/>

Skylar Tibbits

Skylar Tibbits is a trained architect, designer and computer scientist whose research focuses on developing self-assembly technologies for large-scale structures in our physical environment. Skylar graduated from Philadelphia University with a 5 yr. Bachelor of Architecture degree and minor in experimental computation. Continuing his education at MIT, he received a Masters of Science in Design + Computation and a Masters of Science in Computer Science. Skylar currently holds a lecturer position at MIT's Department of Architecture, teaching a graduate design studio and co-teaching a seminar at MIT's Media Lab. Previously, he has worked at a number of design offices including: Zaha Hadid Architects, Asymptote Architecture, SKIII Space

Variations and Point b Design. Skylar has exhibited work at a number of venues around the world including: the Guggenheim Museum NY and the Beijing Biennale, lectured at MoMA and SEED Media Group's MIND08 Conference, Storefront for Art and Architecture and the Rhode Island School of Design. He has been published in numerous articles and built large-scale installations around the world. Skylar has been named a Revolutionary Mind in SEED Magazine's 2008 Design Issue and was recently awarded a TED2011 fellowship. He has appeared as a guest critic at a range of schools from the University of Pennsylvania, Harvard's Graduate School of Design and MIT. Skylar has collaborated with a number of influential people across a variety of disciplines over the years including: Neil Gershenfeld and The Center for Bits and Atoms, Erik and Marty Demaine at MIT, Adam Bly at SEED Media Group and Marc Fornes of THEVERYMANY. In 2007, Skylar Tibbits and Marc Fornes co-curated *Scriptedbypurpose*, the first exhibition focused exclusively on scripted processes within design. In 2007, Skylar founded SJET, a multifaceted practice and research platform for experimental computation + design. SJET crosses disciplines from architecture + design, fabrication, computer science and robotics. <http://www.sjet.us/>

Tony Myatt

Director of the Music Research Centre at the University of York, UK (which he developed and opened in 2004), Myatt researches and coordinates research into audio composition, contemporary electronic music and spatial audio. He was a founding editor of Cambridge University Press' Organised Sound; an international journal of music and technology, founder and artistic director of the Sightsonic Digital Art Festival and the coordinator of the UK Research Roadmap for Digital Music. He has conducted research for a number of organizations including the European Commission and the UK Engineering and Physical Science Research Council; most recently the New Aesthetics in Computer Music (NACM) project for the UK Arts and Humanities Research Council, which documents and researches independent practices in experimental computer music. He and the NACM research team have published (and will be publishing) papers relating to the work of artists Yasunao Tone, Russell Haswell, Olaf Bender, Roc Jimenez de Cisneros, Terre Thaemlitz, Christophe Charles, Peter Rehburg, Ivan Pavlov and Taylor Deupree. Tony is currently writing a book about contemporary trends and approaches to independent electronic music. Myatt also works closely with audio artists on computer and spatial audio compositions, sound installations and performances. His recent projects have included collaborations with Chris Watson, Jana Winderen, Mark Fell, the Vehbi Koç Foundation's ARTER gallery, and all artists commissioned by T-B A21 to produce spatial sound works for the Morning Line. He produces computer music for live performance and installation, was awarded a Herald Angel Award and the International Critics Award at the 1997 Edinburgh Festival for his collaborative installation with kinetic sculptor Peter Fluck (commissioned by Tate St Ives) and has worked on residency projects, including Russell Haswell's LISTEN project in 2009 at The Snape Maltings, Aldeburgh, with Russell Haswell, Chris Watson and Bernie Krause. Tony designed and led the team who implemented the multi-spatial *The Morning Line* sound system, based on his long-term research in surround sound methods and production techniques. He has collaborated with T-B A21 since 2008, most recently on T-B A21 Living Archive: *The Diversity Project*. <http://www.york.ac.uk/music/mrc/>