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Systems Research Group

Manfred Mohr and Douglas Dodd’s in conversation at Carroll

Libby Heaney
February 2nd

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Members of the Systems Research Group visited Carroll/Fletcher gallery yesterday evening to hear V&A senior curator Douglas Dodds in conversation with computer artist Manfred Mohr. To kick off the quantum computer art research project, we visited the V&A to hear Douglas Dodds and Melanie Lenz speak about the early computer art pieces and some of the motivations behind the artworks. Hence it was inspiring and fruitful to hear one of the key artists speak about their own practice and to be able to ask him questions about his practice.

Douglas started by introducing the V&A’s extensive computer art collection and noted the resistance in the 70s to collecting this type of work. Mohr continued by describing his 1971 exhibition at the Museum of Modern Art in Paris. Where, alongside some of his plotter drawings, Mohr gave daily two hour demonstrations of his aesthetic research using his plotter.

One of the most interesting parts of the exhibition was a long sheet of paper, or panel as Mohr calls it, inviting visitors to write what they think of aesthetic research made by a machine. As I am writing this in 2017, surrounded by computers all of the time, it seems very strange that the response was generally one of shock and horror rather than wonder. (Of course, there were some positive comments, but the majority were not). Comments were in all languages, for example

“Ask the computer what it thinks?”

“If Goebels was alive, if would like such a machine.”

“A frighteningly beautiful stainless steel step in the wrong direction.”

“It’s almost as if a spider had cried.”

“The computer will be a pencil in the twentieth century.”

“Man sollte der Machine in den Arshe tretten” (one should kick the machine in the arse), to which the response was “Sie hat keinen” (she doesn’t have one).

There was also the Schoedinger equation for the atomic bomb.

Mohr talks about the reasons for this response

People who were coming out as graphic designers at the time, they got mad because this thing was drawing perfectly and they thought “oh I have to learn that too at one point”. So everybody was scared. The very old people couldn’t care less they laughed. And the very young, they were fascinated. As I said the middle age people would not get it, they saw it written on the walls that they have to learn that too.

Mohr then went on to talk about how there were only two books in the world from which one could learn programming.

With all the hostility towards his work, Mohr wrote a defense in the catalogue for the show, in which he described the machine as his partner. When questioned about this he said “yes, because the machine is something, which only acts what you want it to do” and quoted “the machine doesn’t think, the machine makes us think”.

I wonder which emerging technologies used for artistic means now will invoke such a response? Perhaps not immediately quantum technologies, because at the moment quantum algorithms haven’t moved beyond solving classical problems more efficiently (like factorizing and searching a database) and we can still easily imagine these algorithm. The quantum shock will likely come when the computers start solving problems that are inconceivable to us – likely with the help of some AI/machine learning that can partially ‘see’ beyond our classical world and into the quantum realm. Right now, controversial artistic use of technologies are more likely to come from some new stem cell research hybridizing human and non-human life forms, or if we ever achieve it hard (conscious) AI.

Resonances

I asked Georgia Ward Dyer to reflect on Mohr's talk:

> He was very keen to point out how important his relationships were with the meteorologists/scientists who used the machines during the day, which (although obviously he wasn't explicitly collaborating with them) made me think about the nature of collaboration in science/art projects, and how fundamentally they always rely on the social relations between the people at the heart of it.
> I also found it really interesting the way he covered from several different angles the element of chance or of what I would call the absence of knowledge. For instance, he explained that although he planned ahead which rules he wanted to write, i.e he was very meticulous and in control of the algorithm he was creating, nevertheless the actual visual result was always a surprise as much to him as to anyone else. It was always a surprise what emerged (reminded me about cellular automata stuff/emergent complexity way back from More is Different).
>
> Another example is that he said that at the time, everything was so much in its infancy (only 2 programming manuals in the world!), he didn't know what could be done with the machines. And so it was this which motivated his experimentation – to go off in lots of different directions, to find out what worked and what didn't. It was interesting to hear how he engaged with the unknown in this way given that he explicitly said that he believed people's hostile reactions to his first works done with computers was due to their 'lack of knowledge' (he said 'people always reject technology when it comes too close').
> Also related to epistemology etc but which struck a chord particularly with quantum physical concepts was his statement that 'If I want to talk to a machine, I have to think first what I want to ask it, and how to ask it' which reminded me a lot of some explanations from the Bristol scientists about how [quantum] measuring works, where they basically said that 'the answer you get depends on the question you ask' which I liked a lot.

In my mind, a couple of interesting points in relation to my current research was Mohr's description of his process and also reasons for working with a cube and later the hypercube.

About the former he stated

I knew what I wanted to do in this kind of research, I want to write a rule which is called algorithm. I want to make art, where I know before I start what I want to do, which means I write down rules. The visual result is just as surprising to me as it is to anybody else, because I only know the rules. There is a time span in between you installing a rule and a result and that was my surprise. By writing a program, I got a result where I said 'Jesus is that possible!'.

This idea of a time-span, where an artist does not know what happens inside a computer, is interesting in terms of quantum computing. In classical computers, from the 60s until now, in principle one could use sensors and a memory to keep track of what the algorithm is doing at all stages of the process, even though we do not often look inside the black box, but instead wait for the output of the algorithm to appear as Mohr did. In quantum computing, however, this is not even possible in principle. As soon as a sensor interacts with a quantum computing device, it will cause the collapse of the wavefunction containing the quantum information. Any superpositions and entanglement will decohere into classically distniguishable states, thereby preventing the algorithm from working as intended.

Similarly the use of a memory to store arbitary qubit states is prevented by the no-cloning theorem. Quantum information cannot be copied. Thus when invented, large scale quantum computers may provide outputs that cannot be predicted or imagined by us, even in principle (as simulation of large quantum algorithms by classical computers is impossible). Perhaps Mohr's "Jesus is that possible!" will become "Holy fuck!".

Returning to the latter point of interest above. After taking a freer approach to his work, Mohr reverted to producing forms based firstly on a cube and then in order to increase complexity, various hypercubes. I was always intrigued by the similarities of the hypercube and a quantum wavefunction, both live in a higher dimensional space and cannot be observed in our 3-dimensional world. However, Mohr is not interested with the connections to physics, the hypercube instead allowed him to develop a complex visual vocabulary with rigour and restriction.

The cube became my first vocabulary. It's a structure which is correct in itself and I could take things away or whatever, but it still has the logic of the cube and I cannot do anything wrong. If I do something wrong, you see it right away, just something is not right. Then after a while, I went up in the dimensions, because if you go to fourth dimension, it is infact nothing else than eight cubes intermingled logically. So I had a structure, which is much more complicated and I could do many more things with it…

Mohr goes on to describe how he chooses parts of the lines of the hypercube as his vocabulary to make 'words'. One thing I find fascinating is how Mohr is insistant on working only in 2d and this projection of this rich higher dimensional space – the hypercube – into certain subspaces on a 2d plane reminds me of the collapse of a quantum wavefunction. Information about the original space is lost. I asked Mohr after the talk whether he thought much about quantum physics or quantum technologies and he said he hadn't. I get the impression that his work is intended to create patterns that feel to Mohr like music. So we can therefore ask what the quantum world sound like and how we can bring echoes of this world to the surface?