PERCRO Perceptual Robotics Laboratory, interview with Bill Vorn, September 17, 2007

On September 17, 2007, robotic artist Bill Vorn visited the PERCRO Perceptual Robotics Laboratory in Pisa, Italy, for first of a seminar series on Robotic Art. Before the seminar began, we took the opportunity to speak with Bill about his work. For more information, please contact roboticart@sssup.it

Haakon Faste: Maybe we should begin by having you tell us about yourself—who are you and what do you do?

Bill Vorn: My name is Bill Vorn. I'm from Montreal, Canada, where I teach Electronic Arts and Robotic Art to Fine arts students at Concordia University. I am also a member of the Hexagram Institute, which is an institute for research and the creation of media arts and technologies. I have been working with robotics as a means of expression for more than 15 years, mostly doing shows, installations and performances staging only machines. I am not coming from a fine arts background, or from engineering or computer science; I studied communication and media studies and I have also been a musician for many years before starting to work with robots.

Walter Aprile: Your work has a very theatrical element, so I'm wondering if you could tell us how you become interested in the stage. As a musician certainly you were interested in the stage before, but how did you became interested in this particular form of stage art?

BV: What I'm really interested in is more the viewer's perception and the viewer's reaction than the stage itself. For me a way to get there, to be able to achieve this and to be able to touch the viewer, is through this sort of theatrical spectacle—through this sort of "show" that I have to create. My initial ideas about robotics came from my experiences in the world of music and the world of sound. I met someone who was more into stage lighting and lighting control and so on, and when we started to work together we had this idea that maybe it would be nice animate sound and light in space and have some sort of control over it. So we came up with a project to have sound and light cannons that were robots, because they have two degrees of freedom, that were able to follow people in space. By directing these cannons here and there we were able to spatialize sound and light beams, and create what at the time we called "virtual architectures" with sound and light. But it was really more imaginary than virtual.

WA: Are your shows typically in formal theatre performance spaces, or are they in "re-purposed" spaces that are used for something else?

BV: Well, what I've tried to do is not just use a robot as the sole object in a show—it's not sculpture, like putting object on a pedestal or a robot on a table—it's really about taking over the entire environment, turning the environment into a robot where other robots live in, machines and so on. That's why everything that I can control, like sound and lighting and theatrical effects that could be part of the stage setup is part of the entire automaton. Because it changes and reacts to the viewer's perceptual tools, not only is the robot is reacting but so is the entire audiovisual environment.

WA: So do you care about the site at all, or is it to you a volume of undifferentiated space that you inject life into?

BV: I think it's interesting to show in different type of spaces, as long as it is possible to make the space sort of "disappear" at some point so it doesn't have too much presence. I've presented my work in Middle-aged churches, arsenals from the sixteenth century, and very industrial environments, and they can all be very good as long as the presence of the natural environment isn't too strong for the piece. If I am able to make the space disappear—which is sort of easy with a lot of smoke—that's what I really like in terms of the environment that I can create. The best situation is to show in a black box where you don't have any walls and it's "pure" abstraction.

HF: Based on what you're saying about control—about your role as an artist making a situation that is totally controlled—clearly control is a very important part of what robots are and what robots do. How do you feel about a future in which robots have autonomous control of their environment? Particularly a future which you yourself have not designed?

BV: Well, of course it's very difficult to answer that question because up until now if you look at the automatic controls that we do have, which are not exactly robotic control since they're less intelligent than robots could be, they still have a lot of problems. Just a few days ago we had a problem trying to present at the MAMbo Museum, for example, because there were a lot of automatic things that people didn't have control over. So the more autonomy that machines will have in terms of making decisions could be good at some point—because you don't have to think about them any more—but not good because when you want to take over the robot might decide not to let you. Would you like to be in a car where the car would decide where to go and how to go? No, I think I'd prefer to drive myself.

WA: But in a sense with airplanes it's already a little bit like that, isn't it?

BV: Yes, in a way, but the airplane travels a very direct trajectory. In a way it's really pretty boring for someone to drive.

WA: In terms of autopilot, yes, but already there are some aircraft that are unstable, and are kept stable only by constant computer adjustment. So you still have a stick to pilot them, but in fact you're just influencing the control system—asking "could make it pitch a bit forward please?" But you're not directly controlling anything because then it would fly out of the sky, and dig a big hole.

BV: Yes, if the machine is able to do some sort of self-correction it's less intrusive in a way than if it takes a very drastic decision.

WA: So "feedback is good, volition is not good," to put it in a cartoon way?

BV: Perhaps, but the thing is that artificial intelligence for now does not really exist. There's always someone who programmed a machine to do this and then that, and the machine just follows the instructions.

WA: Maybe this question would be answered by seeing one of your shows, but how do you control your machines in terms of technology?

BV: The way it works is sortof a mixture of distributed control under the command of a master computer which runs the whole show. So the master computer is controlling the audio, the lighting system, receives all the data from all the sensors, and triggers each machine. The machines have very little local intelligence, but they have some kind of autonomy; nothing is wireless—it's all linked by cables—so in fact it works a little bit like some sort of an organic system where there is a brain and you have a lot of nerves going through the body of the organism. This way if something happens—let's say a cable breaks or whatever—the entire organism still lives; the show still runs. There are so many things that people don't even notice that if the arm of one robot doesn't work anymore it doesn't really matter.

WA: Can you name some specific technology for our readers, because they will be wondering what you use? Or do you write your own software?

BV: Well, the main software running the show is called Max/MSP, which is a popular audiovisual multimedia control-type software. And of course it's a programming language, so the program is all custom, adapted for the show. All of our interfaces, all of our technical gear, is communicating by UDP, which is also a popular protocol called OpenSound Control (OSC); it's all based on microcontrollers that are called Rabbit microcontrollers that can be easily connected through ethernet. So it's all custom made stuff that we're doing for these interfaces, whether it's sensor interfaces or controlled interfaces, and because I'm using a lot of pneumatic equipment there are a lot of switches to control the valves.

WA: How interactive are you shows? How much do they react when things are happening?

BC: Reactivity is a component of it, but the show could run by itself even there is nobody in the room. It would still be running on some sort of very basic behaviours which some people would call a "sleep state," but of course they're not sleeping. It works that for each machine, or each part of the installation, we program a set of different possible reactions. These are sets of different behaviours, and depending on which sensors is triggered or how many sensors are triggered then one behaviour will be called, but most generally at random. So it's not always the same; it's not really acting like a switch, there's more unpredictability involved and more surprise for the viewer.

WA: One thing that I've seen in many interactive art installations is that if the interaction is a bit too smart, or indirect, then the viewer either fools himself into thinking he or she is influencing the behaviour of this piece, and is actually not, or else misses the point, especially when something has memory, or long wait states, etc. Do you think that your viewers understand when there is a reaction to something that they do, or to their presence?

BV: They will always think that there is one. Even in some cases where the sensors were completely disconnected, viewers were still thinking that the robots were responding to them. So there is a sort of natural human reaction that is happening, and for me it's not important that the viewer understands something in terms of interaction, because there is some randomness anyway in the decisions of the machine. What is important for me is that they get a reaction, whatever it is, so that they have the impression that the machine feels their presence. Most people's reaction is so automatic that evoking this perception is easy; it's part of the anthropomorphic projection that they do in the presence of a machine, because it's an object that moves and they start to imagine all sorts of different things.

WA: In other words that it's alive, that it reacts, that it's sensitive to what is happening?

BV: It's not alive, it's just that it *could* be alive. But it's not important anyway; it's not the point. Because the point is that if you think it's alive, then maybe it is. It's a bit like artificial intelligence; why do you have the Turing Test to determine whether it's working or not? It's completely subjective. So that's my point; you may as well use the illusion as much as you can.

WA: There is a little bit of an ELIZA aspect with the installations as well.

BV: Perhaps, but it's not my discovery or anything. It's been there since the invention of the automatons.

WA: I think that we've kindof nibbled around the topic, so let me try to strike for the heart of it. What are you going for? I mean, you make these environments, we have seen your photos and taken a look at the videos, and they are impressive. The machines are impressive, the environments are impressive—but beyond the impressiveness, are you driving at something? Perhaps this is something that one shouldn't ask, but I'm reckless: is there a point that you are trying to make that you can put forth in words?

BV: Yes, but of course this question is hard to answer. I can answer very easily by saying "I don't know," like many artists would probably say. But I think for me, as I said right at the beginning, my point is to try to touch the viewer—to really be able to make them feel something in front of this really abstract spectacle of just machines. If I'm able to make them sort of imagine things—if they imagine "something else"—then that, I think, achieves something. For me that's the interesting part; to accumulate all of these interpretations that people have from this kind of show.

WA: Would you say that your shows have a narrative structure?

BV: Not really, because they're not stories where there is a beginning and an end; they're stories in the sense that you do your own story. But it's not my own story. I just lay down the components and people sortof invent their own. Each show does have its own theme, its own thematic structure. For example in *La Cour des Miracles*, where the theme is based on "the misery of machines," we worked on different characters that represent different things. But it was a very loose type of theme, and then it was up to the visitors to interpret it. So we had some people entering the space and really having fun with this, and I saw other people crying because they were so touched by looking at these poor little machines on the floor. You don't know exactly what you are referencing when this happens, but it does happen.

HF: You've talked a lot about the perceptual effect which the machine is trying to make in the viewer, but at the same time there is an underlying theme among the themes: they seem somewhat dark, "hysterical," disturbed…I'm not sure if you've done "the happiness of the machine," but I guess the question here relates less to what you think about them as much as how you feel about them. Do you feel like they are your children, for example, or your pets? And it must be that part of trying to make something for an audience is trying to make something for yourself as well?

BV: Yes, well this question always comes back and it's always the same answer. No, I have absolutely no sentimental relationship with the machines. Because I've worked on them so much from the technical point of view I know them differently, from the "garage" point of view. They aren't the same characters anymore when they are not in the show. And I'm not attached to them; I can replace a machine with another easily, or I can cannibalize a machine to get parts and then re-use them for something else. So the fact that I have this distance in between is not something that I want to reproduce. I work completely differently because I'm not projecting a relationship on a character that I want the viewer to interact with—that's not it. I want to have the relationship between the viewers and the machines almost emerge by itself. And the fact that it's a "dark" environment, or could be seen sometimes as very noisy, aggressive—some would say "violent"—is just a pure aesthetic choice. And it's not always at the same level, there's always some variation. To talk about "the happiness of the machine," yes, it's a project somewhere, but I would think that in the end it would look really kitsch in terms to the aesthetics that it would produce. So I'm waiting a little while so that I can master this thing a bit more, but it's not something that I would discard right away because it does actually fit with the rest.

HF: So given that answer, which seems reasonable, would you consider yourself to be a machine, or your audience to be a machine in response to the machine that you've created?

BV: Well, it's true that sometimes you sort of think a little bit like this, but at the end it's always too reductionistic to reduce everything to a generalization like this It's a bit like when you think of the world like it's a giant cellular automaton. Well yes, but…[laughs]… no, it's nice to have this thought, but at the same time I think it's a little bit more complicated than that.

WA: One question that perhaps I would like to ask is about your references. How do you place yourself in relation with other people's work, not necessarily those in your field? It could be visual artists, auditory artists, or architects—what are important reference points for you?

BV: I have so many references, because I'm touching so many different media like sound, machines, etc. And of course I really like cinema, but not only that. People always think that I'm only interested in science fiction. No, I'm interested in a lot of different things.

WA: If you prefer, I can throw out names and then you can react. For example if I say *Kraftwerk*, what do you think?

BV: Well, this was an influence when I was doing music at the time, because I was in an electronic popular music type of band so of course one of the main influences was Kraftwerk. After that I don't think it had any influence on my robot work, because I didn't have the chance to see the shows that they did with robots. But the music itself, yes, at some point it was an influence. Still, today what I do as a soundtrack for these shows doesn't have anything to do with Kraftwerk or even the music I was doing at the time because it's a mixture of organic and industrial sounds that I process. It doesn't have anything to do with popular music really.

WA: What if I say *Einstürzende Neubauten*. Is it closer to what you do now?

BV: Not really; what's close is probably the background sounds you can hear in their songs, because they work a lot with industrial junk; but it's still based on the type of popular music where you have drum and bass and a singer. I have influences from cinema and from poetry—it's a mixture of different things. How it's translated in my work sometimes doesn't really have any direct relationship. Even sometimes I try to do something which is intentionally not related to anything as much as possible. But if you take the soundtracks, because we've been talking mostly about sound, I relate more now to ambient music, or techno. Ambient music like *Nocturnal Emissions* or *Biosphere* or this kind of thing.

WA: And in visual terms? Do you have important references for your work?

BV: Well, you will find them in cinema, for example, like of course all the science fiction movies like *Blade Runner* and so on. But not because it's something that I want to reproduce necessarily, they just happen to be interesting imaginary worlds that they've created as a setup for their films. That's the kind of thing that I really like; to be able to make a viewer's imagination function in this way. But you can do this in totally different ways. For example I really like Andrei Tarkovsky's movies. I think it's in *Stalker* where it's completely imaginary, and they talk about this and that in a field where you just see a field, but just with the text they make you imagine that there's something there.

WA: Ok, let's namedrop another Canadian: William Gibson. How do you relate to his work? Of course maybe here we are back again to the dark future, or the dark view of technology—how does it look to you?

BV: It's different because he sort of created this virtual world and I'm not into the virtual reality at all but rather the physical tactility of things. My work is really in your face—you can touch the machines, or they can touch you, or you can even get hurt. And it's a world that only exists there in the show; it's not a sortof floating around and you "jack in". In a way it's a fictive world, but it's a totally different world than cyberspace. If you want to talk about other Canadian artists, I really like the work of David Cronenberg in cinema for example, because he created these sort of very weird situations—not so weird worlds by themselves because normally they're quite normal worlds—but the characters are always very unnatural.

WA: So you liked *eXistenZ*?

BV: Yeah.

WA: Not very many people liked that movie.

BV: Yes I know, but no, he's done better movies than this one.

WA: One person whose work I recently saw is Paul Verschure, with his interactive environment called *Ada* in Zurich. But I don't know if that's something that interests you, because it is not robotic at all; it's an environment that kindof "thinks." How do you feel about this other type of art?

BV: Well I think it would depend on the work, because at some point if you're just talking about virtual reality for me it's still a visual image. Even if you animate it and you "motorize" it and you make it interactive, it's still a visual image and it's sometimes difficult to make this image take you somewhere else; you still have the same "representation" that was already there from a painting or a drawing. So even if it's a new way to express the image, for me it's still too close to it.

WA: So how would you define "robotic art"?

BV: Robotic art the art of using robots as a medium of expression. It's the use of machines to either transmit a message or to create an aesthetic experience for the viewers. So this is really making art with robots, its not making robots for solving engineering problems or solving industrial problems.

WA: If you define it like this, then we could say that the topic of robotic arts is not necessarily robots, but rather that robots are a tool.

BV: Well, robots are always tools.

WA: Ok, but you're not making an aesthetic statement about robots, you're using robots to make a statement about something else that depends on what you choose.

BV: Only because I'm not working on the aesthetic of the machine itself. Although you can say that not working on the aesthetics *is* working on the aesthetics. By this I mean I'm not trying to give it a "shape," or put fur on it, or plastic; that's not what I do. For me the more it looks like a machine for me the better it is. It has to look like something with wires and motors that you see so that it's a machine.

WA: You mention that you teach at the university. Could you tell us about your school, and what exactly do you teach?

BV: Well I'm not teaching robotic art specifically, but I do incorporate it in what I teach. What I teach is more electronic arts in general, or interactive arts in general. So it could be interactive video, or interactive sound. It's using sensors to animate a medium, or certain media. In terms of the school, we have a faculty of Fine Arts and there are faculties of all sorts of different departments. So we have art history, art education and most theoretical things, and then you have my department of Studio Arts that is more applied and practice oriented.

WA: Do you involve your students in what you do?

BV: Yes, my graduate students are involved in helping me produce the robotic works; some are more into programming and some are more into metalworking depending on their skills and their interests.

WA: I think that if you're an artist and not a technologist, teaching really poses some key questions about how you work, and the directions in which you push people or how you help them to learn. Do you have a method that you could describe?

BV: Because my students are coming from a lot of different disciplines—like some are from video and some are from sculpture, and some are multidisciplinary—what I do is teach them a wide array of different tools, different technological tools, and I'll leave it to them to take what they want and to do what they want. So they're not forced to necessarily learn about mechanics, for example, but maybe they will be interested in interactive video. And then they will have to know about Max/MSP and the Jitter software and how to integrate the different types of sensors so they can control their video and play it back, etc.

WA: So this deals with the crafting part of what you do—to make sure that the technology works—but is there something that you try to transmit, for example, about the aesthetics of the machine?

BV: No, I don't want to necessarily influence them so much at that level. I think it's up to them to define their own. Of course I show them my work, but I also show them the work of other artists. It is true that in the end some of them end up working in similar ways because they have learned from me or from the way I work, because I'm using, let's say, raw material. All my aluminium parts are standard parts; they're not machined, they're just cut and drilled and bolted together. It's very raw, and you see that some students end up with the same aesthetics because they follow the same procedure. But this is a very low level resemblance. It will always be different at some other level. I try not to force the content, because I think at the university level they're supposed to be autonomous enough to create their own, and start from their own ideas and their own projects. I'm just there to provide the tools and guide them through the realization of the project.

WA: You mentioned that your students come mostly from fine art backgrounds. Do you have students that come also from technology or design?

BV: Yes; well not from technology if you mean engineering or computer science because it's more difficult to cross faculties, but design is in the same faculty so there are a lot of students from design. We have a program called Computation Arts, so there are some students doing programming—it's close to computer science, but it's applied to the arts.

WA: Let's talk about money. I think it's always interesting with artists to understand how it works economically, because from the outside it is always incredibly opaque. When I look at the world of contemporary art it is impressive—like sharks pickled in formaldehyde—but then you think "that must be really expensive to make." It's not really clear how he paid for the shark, or the formaldehyde, or the whole pickling process. How does your system work economically?

BV: Well, creating a robot show is not like doing a painting. It's very expensive, which is why I recycle a lot of my previous work as much as possible. Fortunately in Canada we have a lot of possible funding for production at different levels, like we have two arts councils. There's the federal Canada Council for the Arts, but we also have the Quebec Council for the Arts—so you can apply at those two different levels. And we have other things like the Daniel Langlois

Foundation—which is an international foundation so even if you're from Italy you can apply to this—and there's the Hexagram Institute that supports a few projects. So it's not so difficult to get funding for the production aspects. When it's time to show and really work on the diffusion of the work this is more difficult, because in Canada there are not many galleries or potential show spaces, and they are not supported at all by the government so there are very few of them. For me it's easier to go to Europe or to go to South America to show than it is to show in Canada or in the States.

HF: Have you ever made permanent installations, or work that "lives forever" in some sort of public space?

BV: No. The longest show I did was the one I did for the Science Center in Montréal; it was there for one year, and it was still a major job to maintain because I had to do it by myself.

HF: So as far as funding it's much more of a "production" in the sense of putting on a show that then eventually stops?

BV: Yes, but then it's up to me to take care of, like book-shows here and there. I don't have an agent so I have to do everything by myself. There are no galleries involved because in general—maybe not for every gallery, but in general—they are more into the traditional visual arts. When you start to talk about robotic art they give you strange looks, and even just kinetic sculpture creates a lot of problems for them. So when you talk about these mechanical things that sometimes break and fail, it's probably more difficult for them to think about convincing potential buyers. I'm not at all into the art market.

WA: Do you ever work with corporate sponsorship?

BV: For little things, but never a serious sponsorship. I have a little bit of support from a pneumatic shop in Montréal which sells all the Bimba cylinders that I have—I don't have the money to afford that stuff. They make all these incredibly nice components that are good for the food industry because they're made of special anti-bacterial material that I don't really need. I need the cheap stuff but that works, that's industrial and robust.

WA: Recently there is a sort of rebirth of a very mechanical hands-on sensitivity, and you see for example you find these examples on the web of how to make things, or even in popular entertainment you have *Junkyard Wars*. So suddenly making things and engineering and hacking together robots or machines or devices becomes cool. How does this feel to you?

BV: Well for me it's a really good thing, because it demystifies the whole process. When they started these *Robot Wars* TV programs all the kids became interested in it. Now when you look on the web and you have tons of toys or little gadgets you can buy that are robots—robot this, robot that, you can build or buy all assembled if you want. So people really get interested in working with these things and into how they work. The educational aspect is a very good thing.

WA: Can you feel this in your audience as a change?

BV: Definitely, especially with the younger generation. I remember that there was a French magazine maybe five or six years ago that produced an issue every month on robotics, and they gave you one part of the robot to assemble each time. So you could assemble your robot part-by-part. It was for little kids, but it became the number one selling magazine in Quebec. It was really popular—all the kids went crazy about them.

WA: When I look at what they're doing at MIT about the aesthetics of computation and the generative approach to design, it's a very strong point of view. They have courses like "how to make almost everything" about machining, laser cutting and this sort of stuff. So I have a twofold question, that is, whether you think your school has a similarly defined point of view, or attitude, and how do you feel about this?

BV: Well, because we're in a faculty of fine arts it's not exactly like MIT. We're not driven by big companies or sponsored by industry to do any projects. The core of the faculty is still traditional arts, like painting and sculpture, so for us it's more about giving liberty to the students to produce their own work. And of course because resources are limited we don't have access to all these nice plasma cutters; yes we have nice tools, but it's not like all the CNC machines that they probably have at MIT.

WA: Do you encourage your students to go into junkyards?

BV: Yes, except that in Montreal there aren't so many interesting ones. It's mostly car scrapyards, so all you can find are 12volt DC motors—windshield wiper motors and window motors. Which could be ok for certain purposes, but it's not like on the West Coast where you have all these Army and NASA scrapyards. "Hmm, that looks interesting…" [laughs] I tell them to go downstairs in the trash bins of the Engineering and Computer Science departments, because sometimes they trash a lot of interesting things.

HF: Since our time is almost up, do you feel like there's anything that we didn't talk about yet that might be really important? Is there something that you're interested in that didn't come up, maybe what directions your work is going in now relative to all of the work that you've done in the past?

BV: Well, it really depends what you're interested in. Even if I'm not working on a "kitsch show" yet, I'm still trying to do things that I wasn't doing before. Like integrating a human person into the show, for example. There have always been viewers of course, but no human actors; all the actors have always been robotic. So now we're working on a show where there's a performer interacting with the machines. The robot—which will have a moose-head—is also something different for me because in a way this is closer to sculpture. It's a cast of a moose-head that I've tried to animate with a very precise robot, whereas most of my robots to date are not so precise. Apart from this, I'm also trying to work on a joint project with engineers which would allow me to try different technologies. We'll see how it goes, because it's not always easy to work with these kinds of interdisciplinary teams. But it's an experience—sometimes it works, sometimes it doesn't. Unless you try you won't have any results at all…

http://www.billvorn.com/
http://mfa.concordia.ca/
http://www.hexagram.org/
http://www.mambo-bologna.org/
http://en.wikipedia.org/wiki/Max/MSP
http://en.wikipedia.org/wiki/OpenSound_Control
http://www.rabbit.com/
http://en.wikipedia.org/wiki/Turing_test
http://en.wikipedia.org/wiki/ELIZA_effect
http://billvorn.concordia.ca/robography/Cour.html
http://www.kraftwerk.com/
http://www.neubauten.org/
http://www.myspace.com/nocturnalemissionsofficial
http://www.biosphere.no/
http://bladerunnerthemovie.warnerbros.com/
http://en.wikipedia.org/wiki/Andrei_Tarkovsky
http://www.williamgibsonbooks.com/
http://en.wikipedia.org/wiki/David_Cronenberg
http://en.wikipedia.org/wiki/The_Physical_Impossibility_of_Death_in_the_Mind_of_Someone_Living
http://www.canadacouncil.ca/
http://www.calq.gouv.qc.ca/index_en.htm
http://www.fondation-langlois.org/
http://www.hexagram.org/
http://www.montrealsciencecentre.com/
http://www.bimba.com/
http://ada.ini.ethz.ch/
http://design.concordia.ca/