NATALIE JEREMIJENKO

INTERVIEW BY GARNET HERTZ

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EDITED BY GARNET HERTZ, AMELIA GUIMARIN AND JESSICA KAO.

Hertz: In your opinion what's wrong with or how would you change the maker movement? How did you envision the maker movement and specifically Make magazine when it was first coming out and how it is now? Weren't you in some of the first issues?

Jeremijenko: Yes - I was actually in the first couple of issues. I always say "I made it to Make magazine, so I made it." [laughter] This idea that I found a publication to address something was shocking to me at first. When I first exhibited in the early Nineties with technology, in each and every case, I'd be developing the conceptual ideas, but all people were interested in was that I actually made these things and designed the electronics. Most of the people, most of the audience didn't even get to think about the ideas that I was trying to explore and experiment with. They were just fascinated with the fact that technology was the medium and that if I could do it then they could do it. That was the predominant reception of my work, people asking, "How did you know how to make it?" over and over again. Even with the Suicide Box in the early Nineties the response was not so much about the phenomenon of suicide – a tragic social phenomena at a premiere suicide site in the country, the Golden Gate Bridge. So, to get to Make magazine was to recognize a full monthly publication I finally felt addressed, in which we could actually talk about, how you make it and how that was part of the reimagining about technological mud, if you will. If you think of Rich Gold's thing, making work from the mud of our riverbank. This is our cultural medium, this is the front of social change.

I hoped that Make could actually explore what is possible with new technology, how could we change socio-technical conditions, how could we reimagine our social environmental situations with these new technologies, which is always the question that has fascinated me.

I was really pleased when Make covered the feral robotic dog pack release in San Diego with the students, but they did a story on it that was fairly journalistic. Of course, they didn't write about the struggles to set up a lab that actually functioned in the space, they didn't write about the contaminants or how the contaminants got there, or the kind of political dynamics of the project – for example, how the mayor of San Diego came, how there were only five working dogs released in the class, but how there were seven television news crews, or how we released the dogs on the contaminated public site of Mission Bay, right beside this former military toxic waste dump that is leaching unknown superchemicals into a premiere leisure swim and windsurfing area... and no one is talking about it.

So my complaints about Make magazine are, in general, my complaints about tech journalism. The reluctance of this kind of journalistic mode to explore the very rationale of the project and the environmental, social and political context was something that I was a little bit surprised by. Somebody at Make magazine gives it some lip service, but it was a technofascination instead of redirecting the attention of these companion

robots away from the plastic corporate story of these things as interactive toys – which is just balderdash – and toward the viable and interesting issue about the contaminants of the microprocessing industry. Most of the contaminated sites these dogs are exploring are the sniffing of their own butts, if you will, in a larger industrial ecology sense.

The fact that the journalistic coverage didn't go into any of the parts that I thought were interesting or important was a shock. I realized, to answer your question about the maker movement, this was a kind of technofetishism... of which I am certainly guilty. It's a wondrous engagement with new technology just because it's new technology, not because it's important or critical or that it does something. But this fascination could and should parlay into how does this address the challenges that we are facing, how does this take the challenges of the 21st Century, and give us the capacity to act on them, to explore what is possible.

That kind of bigger discussion is the raison d'ëtre for screwing with this technology, for rejecting the corporate scripts of "Here's the user manual about how you're supposed to use things" and really exploiting the markets of scale to really figure out how we might address the fact that we live in a post-industrial society. We live with over four hundred contaminants in our bodies thanks to technologies and their manufacturing processes - we're trying to figure out where and how and what to do about that. We have to think about these things, and to excise that out of the discussion...seems like that's the meat, that's the whole reason for doing it.

I could care less about a kind of techno-fetishism that's empty and about making vampire costumes. I take play more seriously than that, I think play is really generative and very important and not a distraction, leisure kind of reproduction of sci-fi clichés. I'm profoundly disinterested in them. Why go through all the effort of engaging with reprogramming products and technologies if you're just going to reproduce the same cultural scripts with them? It's boring: you make more vampire costumes and squirt more blood and make a funny noise.

So here we are faced with a climate crisis and tremendous social inequity and opportunities for technologies to really help us explore how to address things. The very agency that is part of the maker impulse and knowledge is to not only to solve problems but to form problems... to think things through in interesting and diverse ways. When that's not what the maker movement is about, it's just developing another app, in summary, that's what's wrong with the maker movement. I'd like to see less about vampire costumes and more about exploring distributed local energy production, or the kinds of big social issues that we're facing.

The first wave of critical making – which I think is in the crystal set radio era – it was a very politicized. The reason for engaging with CB radios and getting your ham radio license and making your own crystal set radio was also to explore the political context: to be able to talk to somebody in Russia, make contact, and to understand who's controlling the airwaves and what they would be used for. This was all part of the necessary discussion you were pulled into when you were made your own crystal set radio: who are we listening to and why?

I have to answer the first question about what's wrong with the maker movement and I think I made one point, the lack of critical discourse outside of the corporate imagination. Instead, the work needs to be about change, social innovation and political innovation – just as much as it is about technological innovation. Social change has been excised from the discussion around making due to political views, and it's a tremendous, tremendous problem.

I think thinking is handwork, which is why I use the term "thingker." We think with things. I can't make sense of the world in theoretical terms without the materiality of what actually works and the open endedness of how others interpret, receive and use things.

I think of making stuff as fundamentally an intellectual activity. I respect the tremendous ingenuity and resourcefulness of someone that is able to make things as much as I respect someone that is mathematically adept or can cite critical theory fluently. The material reality of the world

is where we integrate the social, political, ecological and intellectual ideas – and that's why it's so compelling to me, to this field. So, I don't want making things dumbed down. I don't want "let's teach people about electronics" – this is educational bullshit.

There's not a lot of questioning what robots are, what they do, who they're made for, and how they can be made. If you look at something like robotics competitions, as an example, as this great kind of success in terms of a very celebrated model of essentially making the geeky activity into something like a sport. If you go to one of these robotic competitions - people cheering and yelling "team spirit" - it's exactly like being at a basketball game or a football game, exactly the same, absent of any intellectual discussion about what these robots are for and why you would be doing a stupid little task of putting ping pong balls in a thing, because it's kind of a sports metaphor, not the intellectual metaphor that is actually about what is materially possible and why we make things and how they could be different. You see this kind of sports metaphor imported into robotics, and then you see the kind of like Mindstorms league, which is one of the leagues which just drives me crazy.

The idea of introducing students to robotics through Lego drives me crazy: it is an absurd lie. It is a horrible, disgusting lie... incapacitating. If you're going to build anything, Lego would be the stupidest thing to build it out of, right? Its plastic things are too heavy, they don't have any of the rigidity or any of the structural things that you would actually build something out of. You're not really understanding what works and the fundamentals of engineering. Never would you really build anything out of Lego if you really wanted the form in any way. Moreover, look at the ecological consequences of you these kind of massively industrialized plastic processes. That's actually the big technical engineering challenge, to critique and understand the limitations of it. Moreover, it teaches kids, "OK, you want to a sensor, you want to motor? OK, here's a lego sensor, here's a Lego motor." It turns you into a Lego consumer. It doesn't teach you how to spec a motor, how to spec an LED, any of the fundamentals of what a Mouser catalogue is, or where you would actually look it up if you really wanted to understand data sheets and if you wanted to order something to make something out of. It teaches you how to consume Lego. If there are any transferable skills from the Lego Mindstorms robotics league into useful productive innovation towards rethinking and contributing new ideas into the promising area of mechatronics or robotics... you just don't get there through Mindstorms. There's a way in which the maker movement or this kind of hands on education or this emergence of thinking of things has been co opted and taken by this larger corporate interest and kind of very conservative pedagogical agendas.

Yes... that's good. Thank you.

So that should be question one of your sixteen. *[laughter]*

One thing in particular that I wanted to follow up on from a previous conversation was your comment about open sourcing kind of as a stand in or replacement in the maker community for criticality because I think it's an important point where you see open source being used as the kind of catch all idea that it is socially engaged in some way. Tell me, can we discuss that? Or tell me what you've been thinking about that.

Well, I certainly think the open source movement is critically important to understanding the time. It's really a complex technical achievement done by programmers and geeks in a loosely coordinated by various strategies actually challenging corporate paradigms. I think it is really interesting and important, it's necessary but not sufficient.

It enables collaboration and being able to draw on the tremendous resource of collective intelligence with many people and many ideas to improve and collaborate and conspire and coproduce. To open source something is to greatly accelerate the amount of ideas you have available to you, but it's not the only thing that makes a project good.

Open source is a very important process and movement with wonderful theorists, but frankly, when it comes to a lot of the main and important

issues, the Apache web server doesn't solve the climate crisis. It doesn't actually address many big issues.

The Manhattan Project, that's one example, a lot of smart people involved and it gets technically really interesting, but they spent the next fifty years producing atomic weaponry. This whole idea of having a hothouse of ideas where you get really involved in a smart community thinking through hard problems by itself it doesn't produce a good end outcome, right?

The idea of open sourcing as necessary but not sufficient... one example would be with cola where I am actually working with my twelve year old son on the open source cola recipe published by Cory Doctorow. Make the ingredients visible and that leads to transparency. Make your own open source cola, tasting what it tastes like, realizing that the ingredients are all clove oil, orange oil, lemon oil, essential oils, and you don't have to put the caffeine powder that looks like cocaine, these things can be mixed and reinvented and changed. Open source only begins the process of innovation and to what extent we can change a normal hack. You want to think about hacking the food system, not just about making them open, not just about describing them with some kind of rigour or depth. It's not just creating the recipes. For me, it's the skills and capacities to make and to reevaluate foods we have developed.

You mentioned the idea of hacking the system and I kind of think of that as separate from only making something. Do you see what's now termed as the maker community as only making stuff and not really involved in hacking?

No, I actually think all making is remaking, so everything is hacking. As far as if you're going to make something, you have to use what's available. So to some extent, I use the term hacking as larger than making, as opposed to hacking being a subset of making, because all design is redesign, all making is remaking.

Criticality is generative. To criticize something is to talk about how to make it better, what's wrong with it, how do you change it. In order to actually begin to engage with making, remaking, or hacking something, you have to criticize it. Criticism is generative.

Is the term "critical" too negative?

It does have this critical connotation, that it's just about being negative, but it is a step towards remaking. Understanding that the very idea that you can design something from scratch is a tremendous delusion. Critical evaluation of how things are currently made is what enables you to think about how it could be better and how it can change.

Lets talk about universities and hackerspaces. Are universities a good place for a hackerspace? What do you see as the value of a hackerspaces, in general?

That's the interesting juxtaposition: hackerspaces inside of universities. There's a contrast between when you have a hackerspace inside a university and you are introducing hacking being what counts as pedagogy and how we learn and actually getting hands-on learning as a fundamental skill with critical making as critical as critical writing or critical thinking. This idea of hackerspaces inside of universities, to me, couldn't be more important, particularly in engineering.

A hundred years ago when engineering first got to be less about the guy who was running the engine, a tradesperson who had low status, low compensation, and they got engineering into universities, you can get a PhD in Engineering. That was done through actually changing engineering, which of course is the profession legitimately about making stuff, and this was done by taking it out of the shop, out of the machine shops, out of the wood shops and into math classes, and into problem sets. You can spend an entire engineering education without having to make stuff – I went into engineering because I wanted to make stuff.

My career as an academic has been largely spent on how to actually put hands-on education back into the curriculum. It is not sufficient to only discuss important theorists, but you actually really have to make stuff, really engage what it means to make stuff and who makes stuff and why it is difficult to make stuff.

Walking into a hackerspace is almost like walking into the Stanford shop, where there's a lot of people doing a lot of different projects with a collective set of equipment and an investment in facilities that makes these activities possible. It's a business model, it feels like the Stanford shop, but off campus, just a few blocks away, and you have to pay membership for it. By taking it out of the intellectual context, you obviously lose the intellectual context which I would argue is critically important for this thingking – and that thinking is done with hands, and that thinking is handwork.

Let's discuss critical design within the context of critical making. What useful things can be taken from the concept of critical design, as presented by Fiona Raby and Tony Dunne?

I'm a tremendous supporter of Fiona and Tony's work in producing distopic predictions of technology and the market. I think these predictions are worth contemplating. This type of distopic prediction can be achieved – and is often best achieved – by producing a video and not necessarily making a prototype. In my opinion, making a robust prototype actually gets you to understand what's working and what's not working because it can be put in an open-ended way in the hands of people. Producing a video creates a fictional scenario provides and intellectual context for debate and discussion about how we use things in which technology can play an important role, but I think it's certainly not the only way that good critical design gets done. I emphasize that it is necessary but not sufficient to have distopic ideas.

I have a belief in diverse and atypical types of engineers: women, people not willing to work for the military, or people who aren't seduced by the corporate Jonathan Ive type of superhero icon. In order to understand how things can be better, it's important to gain a perspective on how things are made, who makes them under what conditions, and what the environmental costs are. We should have designers from diverse backgrounds, and actually have honest, believable experiments in what is desirable, not only what is less desirable. It's another thing creating technology, and that's where critical making takes us.

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