

The Musical Chandelier engages in a sensuous duet with Simon Powers' wife, Evvy (mezzo-soprano Patricia Risley) in the 'Touch Me' scene. From *Death and the Powers*.

A dialogue with composer Tod Machover

BY PIO BARONE LUMAGA



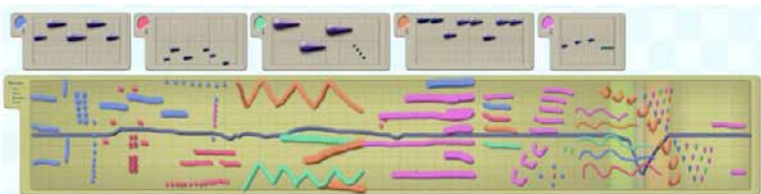


Photo by Paula Aguilera



Pio: You are a musician, a composer, an inventor, a teacher; what connects these states of being?

Tod: At the core, I imagine all possible ways that music can be a central part of people's lives. Pleasurable and entertaining but also transformative, a central part where no particular training or background is necessary. I believe that music is one of the forms that touches us the most deeply: our bodies, our minds, our desires and our soul, and we need to find a way to make it more central to our lives. Because of this bigger mission, I have a kind of hybrid career: creating music myself, and creating the environments, the tools and techniques, to make music or to touch music yourself, and part of that is thinking of new social structures so that music becomes part of our lives in different ways.

Pio: In your life there was a starting point, a decisive experience. Can you describe it?

Tod: Two people, in particular – my parents – and their quite contrasted backgrounds and cultures. I grew up in New York and my mother is a pianist but also – to this day – a very creative and unusual music teacher, and my father was a pioneer of computer graphics. My mom grew up as a musician in New York State, in a European high-culture environment, while my father grew up in the Middle West, in Iowa, with a very visual and popular culture background. My dad's company made one of the first graphic displays and he believed you needed to have intuitive ways to interact with technology; he was making these machines one generation before Steve Jobs. So the combination of creative music and creative technology was in the family.

I remember my mother, when I was a three-year-old kid, teaching us piano and at the end of the lesson there would be 3 or 4 children and she would say: "OK, before you go home, I'll give you 5 minutes, go anywhere in the house and each of you find an object that makes an interesting sound, and come back." We would all run around the house, find something, come back with books, pots and pans, pens, coins, lamps, anything (!), and she'd say: "OK, what sound does that make? And that? And what's the loudest sound you can make from that? The softest sound? What happens if you make this sound and that sound at the same time? Oh,

that's great, now can you think of a word to describe that sound? Yeah, that's 'funny', that's 'scratchy', well, can we make a story out of these sounds?"

In about 15 minutes we would make a little story with these sounds, we'd have a composition and she'd say "OK, for next week, take it home and see if you can bring me back a picture of what we just did. And when you come back we'll try to do it again." So in that little bit of time – and you talk about inspiration – we learned that music wasn't just something that a bunch of dead people made and it wasn't fixed on paper, it wasn't a frozen system, it comes from the world around you, it is in nature, in our voices. And even the notation for music – which is so difficult for children to learn – is nothing more than a way of remembering what we have done so that we can do it again, perhaps interpreting it differently each time but telling a similar story. I was very lucky to have that, and I kept it, this inspiration for creativity in general and especially for music as something to discover and shape.

Pio: I saw your TED conference when you brought on stage a man with cerebral palsy where he could step in, and play his own music. The audience was moved, I saw people crying.

Tod: Growing up, I was interested in music, politics and sports, but when I was about 16, I decided that music was what I really wanted to do. I studied music composition at Juilliard and then went to work with Pierre Boulez at IRCAM in Paris. But it wasn't until I had children, and my girls were little, that I wanted to find a teacher like my mother, but I couldn't find one. That's when I decided to figure out a way to make these kinds of activities for children, using new technology to make instruments so that they can experiment, fall in love with music and learn about composing first and not when they are 25 years old.

Then when I did it, I thought that, if children really like this, there must be other people who would like to make music but who have never had the chance. A way for music to help people with health, for people

Rhythm tree, *The Brain Opera*



Photo: Tod Machover

to show who they really are, or communicate through music when they don't have another means. And that is when I started working at Tewksbury Hospital north of Boston, and met someone like Dan Ellsey, who appeared with me at the TED conference. Tewksbury is actually a wonderful, inventive hospital with long-term residents who are seriously ill, aged 20-100 with every imaginable problem, cerebral palsy, schizophrenia, Alzheimer's, strokes... but the hospital is thinking: well, given that, what can we do help make their lives as rich as possible.

I had no idea if the patients would be interested in working with us and our Hyperscore composition software. I remember the first day I presented Hyperscore, and I said that we were going to do some workshops there for a few months and that we'd invite anyone who wanted to learn how to use this software to compose original pieces, and that we would perform these pieces and do you have any questions? There were about 500 people, in wheelchairs, on beds, and 200 hands went up, and everybody had something they wanted to do. Nobody had ever asked them before. And some could talk, others had to talk through a nurse: "My brother plays the guitar, I'd always wanted to write some piece with a sort of Spanish style..." or, "I sing, but I don't sing very well, but I want to write a song ..." Everybody wanted to do something and didn't know how, so it was incredible, the whole project was very successful with amazing pieces coming out of it, and we have continued to develop this Music, Mind and Health work quite a bit.

Pio: This brings me back to the relevance of creativity with children. It seems that today the education system is doing everything possible to stifle creativity at a young age. Aren't you doing the opposite?

Tod: I think you're right. In most places in the world, in early education until about age 6 or 7, it is actually pretty good. It is around that age that in most cultures something changes. If today you go to a kindergarten, the children's work is based on inventing something original using open-ended materials. There will be stuff on the table, pieces of plastic, felt, some paper, maybe some scissors and the teacher would say: "Here are some materials, for a little while see what you can make with this." They would never say: "Here is a house, can you make an exact copy of this house?"

So here is the number one idea: learning comes out of exploring the material, not by looking at an end result you are trying to copy; you aren't trying to learn some ideas first and then apply them to a situation, you are experimenting. And a good teacher picks the materials very carefully, poses an interesting problem, and sets things up in a way that is exciting to try. I think the idea is that every part of learning and making things should be creative, the way it is structured should come from the passion of what children – or anyone – really want to do, and it shouldn't be dictated from something else. I think the real trick, something I'm working on now – whether it is for children, high-school, college students, or for adults – is to find the right balance between a totally open environment where you have absolute freedom to

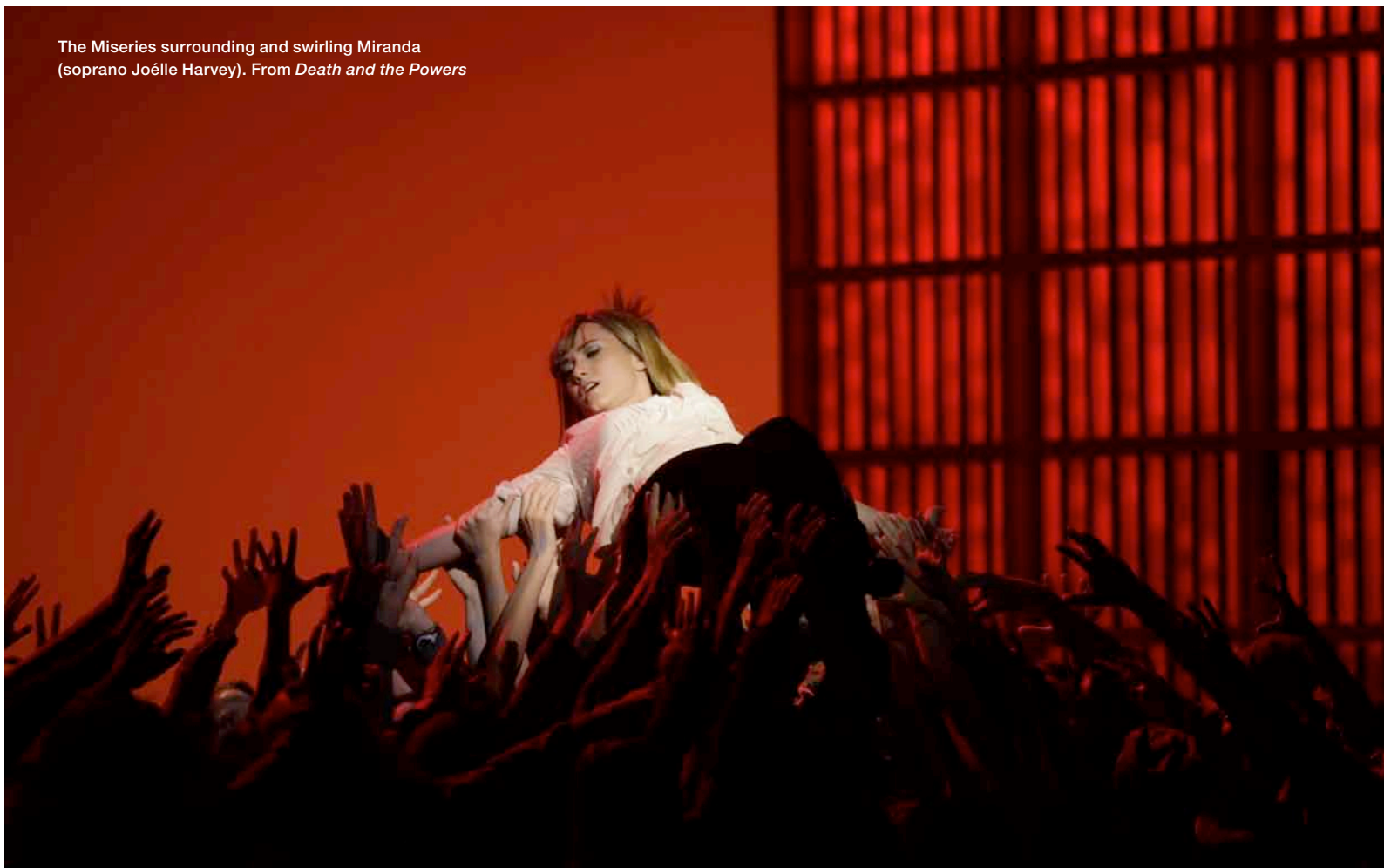
do anything, and a more constrained way where you can get some response, from the right person at the right time, because both extremes are important.

I think basically what happens in the educational system around the world is that our society allows children to be rather free until about 6 years old. Up to that age most children are not thinking: "Is this good or bad?" They just want to try something, happy to explore, to do the next thing, and by exploring things they are learning about the world, they are learning ideas. Then around 6 or 7 they start thinking, "Do the other kids like what I'm doing?" Being more self-conscious, you start looking at yourself in the mirror and that means you need some other strategy. So the best thing to do is to think of a learning strategy where you show children that it is still OK to make experiments, that there's a safe place. This is one of the great things with the arts, especially with creative arts, but not always with music; because at about age 6, most children who are going to start music don't compose, they learn the rigorous discipline of violin or piano, so they are not free at all, reproducing the music of others rather than creating their own.

Pio: Isn't it very much about imitation, repetition, right or wrong?

Tod: Yes, I mean you can have a wonderful teacher, but first of all it takes a huge amount of discipline, hours to learn these difficult instruments. Second, for most teachers it is either a right note or a wrong note, right rhythm or wrong rhythm, it's a painful process, and even with a nice teacher the feedback is pretty harsh.

The Miseries surrounding and swirling Miranda (soprano Joëlle Harvey). From *Death and the Powers*





Pio: Very prescriptive?

Tod: Yeah, it's very much: "Oh my God it's not right" – that's why if you do something like painting or drawing, improvising, or composing, it's a wonderful thing. As with a studio class, it's the quality not the "rightness" that matters. What does it mean anyway to make a piece of music that is right or wrong? If you are imitating something, maybe, but a free environment is much more valuable. So I believe the important thing, at least in parallel with other activities, is to make sure the children have this project-oriented, open-ended, creative experience. While they are growing up, these activities can be adjusted so that they remain appropriate at each different age.

Pio: Can a child compose even if she/he is very young?

Tod: Oh absolutely, I believe in this so much. And when you are very little – my mother did this with us – you could compose with your hands, with objects, nothing fancy. One of the great things about technology is that it is a prosthetic, a way of increasing our abilities based on what each of us can – and can't – do well. If I lose my arm, I get an artificial arm, and in that case a prosthetic is in place of something that I no longer have. But actually a prosthetic is a way of taking who we are and allowing us to do something more with who we are. Each child has this incredible open spirit when it comes to looking at the world, enthusiastic about everything, something we lose as adults because we've already done everything and it's very hard to experience the world as if for the first time. And a child has other abilities that we don't have, more energy – they can run all day – but they may not have fine motor control of their muscles.

But you could design a technology to take advantage of this: For our Toy Symphony project, we made Music Shapers for little children, done out of fabric. The thread is lovely and colourful, with little bits of metal in it and the metal measures how conductive is your skin, where you are touching it and how hard you are touching it. The entire embroidery is actually a sensor, so we can give this to a little kid and we can program it to do whatever you want, for example to do just loudness 'ta, Ta, TAA, TAAHH' or to change sound 'Tii, tash, svoush'. It is physically very simple, and a little child can learn how to make a sound as soft as possible, but still hearable, we can adapt this technology so that it is appropriate for any age. And our Hyperscore composing software lets kids draw lines and colours, so even starting at about age 6 or younger, kids can draw with this and can make music in any style, and this music can then be transformed automatically into traditional musical notation to be played live by friends, teachers or professionals.

Pio: What keeps inspiring you?

Tod: I think creativity and being creative is the way to stay alive, the most dynamic way to be in the world; everything you are confronted with has some potential to be magical, as well as magically appropriate. Yes there

are some rather difficult things with which we are confronted every day, but perhaps just a slight change will bring out the positive side, some latent potential to make something good happen for you and/or others. I do all the work I do as an opportunity to make each situation – and life in general – a little better. Creativity keeps you awake, it brings out the best in everyone and in every situation. And this can happen by making a new piece of music, or a new possibility for someone, or sometimes just by deciding how you spend the time with the people you care about.

My music is actually about being connected, not so much about other music, or about sound, or about knowing, but about life itself. It is about my observations, how people behave and how nature is, and it's a way of communicating to other people. I love opera and have made many of them, but I especially love music without words, since that is like an enormously compressed, intensified version of some emotional situation. By listening to music like this, it might be a way of stepping back and understanding your own human response in a more complete way, kind of like a rehearsal of your relationships with the world and with other people. So my inspiration is to take the world around me and to feel it and think about it and then to express it in a musical form so that I understand it better and can actually act better. In this way, the music has a very practical purpose.

Pio: In a project, in the process of creating sometimes we ask ourselves "Where am I? Am I still in the process or disoriented?" Is there a moment in which you ask yourself: "Am I losing it?" What are your creative markers?

Tod: That's a great question! I don't think anybody ever asked that question. In general for me the definition of a project is how to set up the environment where it is the

opposite of 'losing it', where you find and grow whatever is the right potential at that moment, and you cultivate it until it reaches fruition and then it is done. There are of course projects that I have done where at some point you say, for whatever reason, "I cannot finish this now, I don't have the right ideas," or "I'm lost, I must stop". Often, at that point, you can either put it aside or there are other ways to solve it. I think one of the reasons I like being in the Media Lab and inventing machines along with my music, is that it is a great community for establishing the trust it takes to share ideas at a very early stage of gestation, when they don't seem ready to be shared. But if you can trade ideas very early on, especially with very open-minded people such as my students, it is a great way to enrich them, to push them further, and to develop them in ways that you may never have imagined.

The other thing which I always tell my students, because I have learned this myself from experience, is that a good teacher does not necessarily provide you with a single strategy or approach to solving problems creatively. Probably the best composition teacher I ever had – the one whose thoughts still resonate in my own mind fairly frequently – is the one who had the least methodology or underlying theory to his commentary. In fact, I had to learn how to ask him questions to understand the connecting theories behind his reactions. But he also told me to look with a fresh eye and ear at each new problem, and to have multiple strategies at hand to address any situation that came up. It is this flexibility and repertoire of complementary techniques that allows us to find the most fruitful path, to steer around ruts, and to proceed whenever we do get stuck. In this way, each of us needs to develop a very good intuition about what methodology is going to work for you, right now – this year, this week, this day, this hour.



Photo: Andy Hong

Tod Machover demonstrating Hypercello to Yo-Yo Ma

Bono playing Machover's Sensor Chair



Photo: Tod Machover

Pio: Looking at your work, it seems that one of your engines is to expand the boundaries of music and the other is creating environments and tools that respond and interact? Am I looking in the right direction, about where you are going? Is co-creation still a central role?

Tod: Yes, in terms of expanding the boundaries of music, I think you're absolutely right especially because, with the iPod, Internet and Pandora, etc., music is now an increasingly large part of people's lives. But we need to find new ways of helping people to find the music that will be most meaningful and helpful to them at a particular moment, and then also provide sophisticated and sensitive ways for each person to adapt and shape that music so that it is even more fully adapted to their needs.

In fact, there is increasing potential to make music that really touches people since we are learning so much more about the neuroscience of music, and about how music affects our body, our tissue and muscles, our genes. My guess is that over this next generation we'll learn to create a truly Personal Music that can be especially designed for a particular person and then fine-tuned for you at a particular moment. We can imagine how this might be the approach for "prescribing" music for a disease or therapy of mind or body, but it is also the right way to think about adapting music for everyday life situations, with each piece responding to you like a dear friend who can listen to you, give advice when needed, help solve a problem, or simply "be there" in moments of stress, triumph, or loss.

Going back to what we said about an open creative environment, what is missing in culture in general and especially in music is a kind of co-operation/co-creation where people at all different levels of experience and expertise – from famous and celebrated professionals

Tod Machover jumping with *Guitar Hero*



Photo: Zack Smith

to students to rank amateurs – can make and share music. Right now, I can be part of a large Internet community where thousands of people can share ideas about music they like. But it is unlikely that your favourite artist – whether it be Yo-Yo Ma or Björk – is going to be part of that network. The next step is to set up environments with a new kind of 'creative ecology', where in fact artists and everyone else work together to create and invent truly new experiences. We are trying such a project right now with the Toronto Symphony Orchestra (<http://toronto.media.mit.edu>). I have invited the entire city of Toronto to work with me to create a new symphony which will be premiered in March 2013. It is the scariest project I have ever done, since the risks

of failure are significant. But if we can propose a new model for building creative communities, I think it will be very much worth it. And with luck, we will have created some melodies, harmonies, sound textures, and musical stories that will be as moving in their human content as they are surprising in their freshness. Stay tuned! ■

A list of URLs for further reading:

- <http://www.todmachover.com>
- <http://operaofthefuture.wordpress.com/>
- <http://opera.media.mit.edu/>
- <http://powers.media.mit.edu>
- http://www.ted.com/talks/tod_machover_and_dan_ellsey_play_new_music.html
- <http://www.hyperscore.com>

Tod Machover – called "America's most wired composer" by the Los Angeles Times, and "a Renaissance man for the 22nd century" by The Guardian – is known for his innovative compositions as well as for designing new technologies for music. He is the Muriel R. Cooper Professor of Music & Media at the MIT Media Lab, where he directs the Opera of the Future Group. He studied with Elliott Carter and Roger Sessions at the Juilliard School in New York, and was the first Director of Musical Research at Pierre Boulez's IRCAM in Paris. Machover's music has been performed and commissioned by many of the world's most prestigious organizations such as Lincoln Center for the Performing Arts, the Kronos and Tokyo String Quartets, Paris' Ensemble InterContemporain and Centre Georges Pompidou, the London Sinfonietta, the Boston Symphony and the Los Angeles Philharmonic. Machover has received numerous prizes and awards, including the Chevalier des Arts et des Lettres from the French government, the Ray Kurzweil Prize for Music and Technology, and the 2010 Arts Prize from the World Technology Network (CNN/Time Inc.). He is renowned for his pioneering work with Hyperinstruments, which use technology to extend the expressive range of traditional instruments for virtuosi like Yo-Yo Ma and Prince, as well to create new musical experiences for inspiring children, for promoting health and well-being, and for the enjoyment of the general public through games like *Guitar Hero*, which grew out of his Lab. Machover is especially recognized for his unusual operas, including the science fiction VALIS, the audience-interactive *Brain Opera*, and the robotic *Death and the Powers* which premiered in Monaco – under the patronage of Prince Albert II – in September 2010 and is now touring worldwide. He is currently composing a new work for the Toronto Symphony for which he has invited the whole city of Toronto to collaborate. This Concerto for Composer and City will premiere in March 2013.

Simon Powers (baritone James Maddalena) attempts to convince his daughter, Miranda (soprano Joëlle Harvey) to join him in *The System*. From *Death and the Powers*



Photo: Jonathan Williams