

Interview with Stephen Malinowski

AA: On your musanim.com website, you say that the Music Animation Machine (MAM) project was born of a "vision" while listening to a sonata by Bach (a composer you seem very attached to). It is therefore understandable that, originally, you desired (as you wrote) to make the notes dance with the music. But, more precisely, where did your interest in the relationship between music and (animated) graphic signs, which characterizes the MAM project, come from? Is it really a genuine intuition or does it come from interests of your past life, for example, theoretical studies, practical needs ... or something else?

SAM: Actually, my original desire wasn't exactly to make the notes dance with the music. In the vision that day in the 1970s, the notes danced to the music—and did lots of other beautiful and fascinating things—on their own. However, it was my mind which allowed this, so the complexity of what I saw was limited by my comprehension of the music. The path that led to the MAM began as an attempt to address this limitation by making a score that was easier for me to follow. As it turned out, the path *did* eventually lead to my making scores in which the notes danced to the music (though not in as nice a way as they did that first time decades earlier) and to an interest in the relationship between hearing and vision—but those were results, not causes.

I've been interested in both science and music most of my life. If I'd been a better student (which I might have been if some of my mental limitations that were only diagnosed when I was an adult had been understood when I was a child), I probably would have ended up as a physicist, like my father. However, when I flunked out of calculus, I switched my major from science to music (which I would have flunked out of too but for unusual circumstances)—but I never lost interest in science.

My understanding of music has always had a strong theoretical side. As a child, I was taught music theory as part of my piano lessons, and my major in college was music theory and composition. I read books about music cognition, and studied the physics of musical acoustics. In 2001 I accepted Lloyd Watts' offer to join his Silicon Valley startup (later to become Audience, Inc.) That enterprise was built upon Lloyd's background in engineering and neuroscience, and during my years in its employ I learned a lot about the neurology of hearing.

My background in science has informed my work on the MAM project, but my motivation has always been simple: to do things that are interesting and fun and to share my experiences.

AA: Your work, begun in 1974, takes place in a period of almost forty years. What are the areas, the application fields that have shown more interest in your work? Teaching/education, artistic/expressive (i.e. Björk), scientific and research (cognitive psychology or others), commercial (various applications), or what else?

SAM: As you might expect, much of the interest has come from music educators who use my animations in their classes. And, of course, I've made videos in collaboration with many composers, arrangers and performers. I also worked with a dance company in Australia that choreographed a piece to one of my videos, which they projected behind the dancers.

In 1989 I did a collaborative video with the animator David McCutchen (in which he used one of my animations as "source material" which he then crafted into his own film), and the video artist Stefan Sargent has likewise used my animations as a starting point for multimedia works.

Many people have used the freeware version of my software to make their own videos, many of which are posted on YouTube. An interesting related development happened in Japan on the Nico Nico Douga video sharing site: there, a composer wrote music specifically intended to be played on the MAM—with "special effects" that were designed to be both musically and visually interesting.

My work with the conductor program led to somebody using it with quadriplegics who are thus enabled to perform music by (if I'm remembering correctly) moving their eyebrows.

Other than selling videos (which I've done since 1990 with modest success—via VHS, DVD and digital download) and collecting some YouTube advertising revenue, nothing commercial has been done with the MAM. I expect this to change in 2012, though: I am collaborating with Etienne Abelin (and a team working with him) to develop a live-performance version of the software. Once this is complete and "road-tested" (at chamber music and orchestral concerts in Europe later this year), I will license Abelin's group to sell it.

Ideally, I would like to collaborate with a video game company to develop a tool that would allow visual artists to work more easily in this field. I have lots of ideas, but as a software developer I am lazy, slow, and easily distracted (not to mention uninterested in doing product support). I need help.

I'm digressing ... let's see, you asked about cognitive psychology ... there was a researcher who did some experiments ... I think it was to find out whether subjects were better able to remember music if they were presented with visual representations ... I forget the details.

AA: On your website we can read the rich and interesting development of your work. A process that has been accompanied, of course, by technological developments thanks to which you were able to build, gradually, upon your marvelous initial "hallucination." What type of further developments of your research do you expect?

SAM: Research is hard to predict—you don't know what you will find, and what you find is a factor in what you look for next. So, what I expect (and hope for) is to be surprised! One thing I intend to keep working on is the development a visual language to represent, in an intuitive and satisfying way, the elements of music. My animations are not very good at showing the rhythmic aspects of music; I have lots of ideas for how that might be improved, and I hope to experiment with those. I've done some work on visualizing timbre, and it would be nice to continue that, too. But the main thing I'm interested in learning to depict more effectively is musical gesture. I have hardly scratched the surface of that, and it is *so* important.

Beyond that, there are many sub-projects which I wouldn't exactly call "research," but which would be useful advances. For example, I've done some videos in which dynamics are visualized (http://www.youtube.com/watch?v=_nFZpqampXo), but this has so far been limited to recordings with only a solo instrument, so that it was easy to extract the dynamic information. Doing this for recordings with multiple instruments is not, from a theoretical standpoint, impossible, but it would take a serious development effort. Also, synchronizing audio recordings with scores is currently quite tedious for me (often the most time-consuming part of making an animation); it would be nice to develop software that facilitated this.

Another project I hope to work on but which requires both a lot of research and a lot of development effort is to make video games that teach you how to sight-read music. I'm a good sight-reader at the piano, so I know how much fun it is to sight-read, for example, a piano quartet with a trio of good string players. A video game which provided an incremental path to this skill

would be (to use the patois) *awesome*. I'm planning to move toward this with an iPad/iPhone/iPod game that trains the player in sight-reading rhythmic notation.

AA: Did you feel, in some way, alone during the evolution of your work? (... even if it is difficult to feel alone with Bach!) Or did you receive the support of friends, colleagues and other scholars?

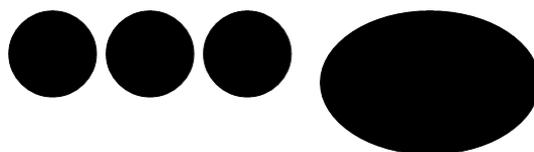
SAM: I have mostly *worked* alone, but I haven't *felt* alone. I suppose that's mostly my nature—I've never felt lonely, and I enjoy being alone, especially when I'm working. My friends and colleagues are enthusiastic about my work—which is not surprising since I've met many of them through it. The most significant support came from Edward Tufte, who urged me to mass-produce a videotape, which he marketed and promoted for several years. And, of course, I've gotten lots of positive responses to the videos I've posted on YouTube, which has been gratifying. But I've come to realize that I am fundamentally a loner, a hermit, a person who prefers be alone and do things on his own. That, and the fact that a lot of what one might call "creative exploration" is best done by a single person, has made it seem very natural to do things the way I've been doing them.

AA: For you, music does not seem to be an "object" to study, but a living "creature" which elicits "anim/action." In other ways it seems that you are looking for a way to "listen with your eyes." How would you describe, in your work, this union between the aural and the visual? In your research, that is deeply "audio/visual" (and maybe not until your work has this term has found its best sense), have there been theories or other similar studies, more than others, which you needed to deepen or you wanted to deal with?

SAM: I'm so glad you ask simple questions with simple answers, Alessandra.

The idea that hearing and vision are two separate things is just that—an idea. It's true that the eyes are in a different part of the head than the ears, and the neural pathways from these sense organs start out as distinct, but by the time you get to the cerebral cortex (where what we call "thinking" happens), the distinction is much less clear. In people with synaesthesia, the distinction can vanish entirely (for example, a synesthete may experience the color red whenever she hears the musical pitch C), but even in a normal person, a single brain, doing the kinds of things a brain does, is responsible for making sense of the data from all senses. So another way of describing perception is to say that there is only one sense organ, the brain, extracting whatever meaning it can from all of the sensory data it receives.

Consider the first few seconds of Beethoven's fifth symphony. When you hear this, your auditory system deciphers the vibrations reaching your ear as "three that are the same followed by one that's different." This is a simplified description, of course—there is a lot more detail that is extracted—but the "3 + 1" idea is part of most listeners' perception. Similarly, most people seeing this



would agree that "3 + 1" is part of their idea of what they're seeing. In other words, *same versus different* and *number* are not restricted to one sense. There are many such perceived "features" (or "aspects" or "distinctions") that are common to visual and aural objects ...

before versus after
higher versus lower
larger versus smaller
faster versus slower
together versus apart
sparse versus dense
smooth versus rough
regular versus irregular

... and so on.

The word "analogy" is sometimes used in this regard, that is, to say "the four black marks on the page are analogous to the first four notes of the symphony." That's true, but our brain is able to go further than mere analogy. You might say "when you watch someone talking, the motion of their mouth is analogous to the sounds you're hearing," but the perception is stronger than that; there's *perceptual fusion*. You no longer perceive the moving mouth and the sound of the voice as separate objects; you perceive a single object—speech. Your brain knows that both senses are providing information about the same phenomenon, and integrates it into a single, unified experience. As a result, if you're having a conversation in a noisy environment, you will be able to understand the other person better if you watch their mouth, since you can fill in missing details about the sound with what you see.

The same thing happens when you watch a music visualization. Your mind is fusing what you hear and what you see into a single experience. And, to the extent that you understand the mapping between the sound and the visualization, the visual elements can help you perceive aural elements that you might have missed.

There has been lots of research about this, and I've studied some of it, but the science of it, while interesting, only takes you so far. In a way, it's like the science/technology/art spectrum: you have the way things are (acoustics, neurology), the way things work (psychoacoustics, neuropsychology), and you have what I do, whatever you want to call that. And what I do is: try to find things that work, that are interesting, satisfying, meaningful, helpful, fun, beautiful ...

AA: You have shown great generosity in making available, through the internet, many of your precious animations. What led you to this "philanthropic" decision, rather than moving towards a marketing diffusion of your work?

SAM: I think it was mostly laziness and a distaste for risk, stress, and business. If somebody had offered me a bunch of money for my animations or for my software, I would have sold, but that never happened (except for a handful of commissioned animations over the years). I worked as a software engineer for most of my working life, so I knew what it was like to develop, market, and support a commercial software product, and it wasn't something that I wanted to take on by myself. I was interested in exploring what the software could do, and I could do that without stress or risk, at my own pace, by just doing it as a hobby.

The main downside to that approach was that my "day job" took up most of my time and energy, so I wasn't able to give as much of myself to music visualization as I wanted. Now that I'm retired, though, I can spend as much time on it as I want—which is pretty much all the time.

AA: One of the last questions, Mr. Malinowski, about “identity”. On your website you dedicate a whole page on "variations on the theme" applied to your name, collecting about thirty "misrepresentations." Aside from this nice joke, how has Stephen Anthony Malinowski been able to combine, during this years, these various souls? That is, how have you integrated your interests as a composer, musician and musicologist, computer scientist, etc.? Could we say that today musanim is the metaphor of your changing nature?

SAM: (I'm tempted to flirt with you by saying " 'Mr. Malinowski' is my father; please call me Stephen.") It's remarkable to me that I'm involved in a project that draws upon so much of my training, so many of my experiences. Piano lessons, learning the guitar, recorder, flute, violin and viola, studying music theory, orchestration, doing ear-training exercises, taking LSD, studying algebra, geometry, trigonometry, physics, acoustics, electronics, psychoacoustics, neurobiology, working as a music manuscript copyist, rehearsal pianist, conductor/director, teacher, composer, learning to write software ... it's all been useful. From where I sit now, it seems natural, obvious, inevitable ... but I know that it wasn't. There was a point in my life when it seemed that I had no prospects: no way to earn a decent living, nothing to do that I was interested in doing, sick, dispirited, without a girlfriend, hopeless. With the help of friends and relatives, I was able to find a way forward, and my life now seems, by comparison, miraculous. I'm so lucky.

But to answer your question, I don't feel that I've had to work to integrate my interests, because I can only be interested in one thing at a time. For example, right now, I am interested in answering your question. The fact that I am not, at this moment, indulging my interest in saving the world by developing a means for people to argue effectively (another of my back-burner projects) doesn't bother me at all; I'm not aware of it (except briefly, to use as an example, and experience a brief pang of regret and guilt that I'm not working on it now). My interests are not demons that plague me, but strengths or tools, there when I need them, out of sight (and out of mind) when I don't.

And I don't think my nature has changed. With age, I've gotten slower and more stupid, and I suppose you might say I'm more "mature" in my judgments (or, then again, you might not), but I don't feel that I've changed much; I feel I can reach across the chasm of nearly four decades and touch the twenty-year-old for whom notes of Bach violin music danced and say "hi, it's me—you."

AA: Finally, to leave. I discovered you some years ago (through the magazine I write for) by chance, on YouTube and then on your website. What do we do now? We meet with all our readers in these same places? Or you invite us to do more research (as teachers, as educators, as scholars), with you? With your lucky "hallucinations" (perhaps without thinking specifically about education) you had already given rich ideas to music teachers who have achieved your animations on the net. What could teachers do for you now?

SAM: They are already doing it: using my work. Children are my primary intended audience, and I am gratified beyond expression to know that my animations are being used to introduce young people to concepts like homophony versus polyphony, imitation, etc. What next? I know what *I'm* planning to do next, but I am myopic. So maybe what teachers should do for me is tell me what to do next.