

# SoMoS

Victor Quintana

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# Contents

1. Introduction .....	3
2. Background .....	4
2.1. Vera Molnár .....	4
2.2. Manfred Mohr .....	4
2.3. Sol LeWitt .....	5
2.4. Charles O'Rear .....	6
3. SoMoS .....	8
3.1. Implementation .....	8
3.2. Screenshots .....	9
4. Conclusions .....	11

# 1. Introduction

From an evolutionary standpoint, humans are extremely strange creatures.

Despite only accounting for ~2% of our body mass, a human brain consumes ~20% of our energy. We are bipedal, and while it freed our hands for other uses made us worse runners and more vulnerable to back problems. The complexity of our brains meant we have extremely long developmental periods, where we needed to depend on adults to live.

There are hundreds of species faster, nimbler, bigger, and certainly deadlier than us. Most enjoy from extreme biological adaptations to their environment, giving them exceptional stealth and speed. Yet, we are the dominating species. We established presence in almost every corner of the world. It took eons for humanity to learn agriculture— but only millennia later we sent people to the moon and back.

The greatest distinguishing factor might not be the size of our brains nor the dexterity of our hands, but the way we think. We spend so much time growing up, being defenseless, because it's an advantage to learn from passed down knowledge instead of having it encoded in our DNA. It made us versatile enough to learn new things quickly, internalize them as if they were always part of us, and pass them down to the next generation.

Our versatility left us room for expression, and creativity. Even with our hands alone we are able to transmit endless amounts of knowledge. Place something into those hands, and knowledge is no longer a limit. We were able to transcend our needs for survival. We chose to explore our world, understand its nature, and create not for our survival, but for ourselves.

I have always been fascinated with art, especially instruments and music. I love the way human beings can learn to play an instrument as a part of their own body. I love even more the fact that our ears have apparently been designed with an attunement to music, to rhythms and harmony. And what I love most about music, and art in general, is that it is a language: it transmits information, it has certain rules, and it is unique to every culture, ethnicity, country or group of people.

Most people love art. But most people don't make it. I feel most people would like to make art. Of course, picking up a pencil and learning to draw, or learning an instrument, or in general learning to 'speak' the language of art takes both time and patience, which most people don't have enough of. Some people don't even try. I want to change that. I want to see what kind of art the average person can make, when given the chance to do so. While I don't proclaim myself an artist, per se, I feel I can be an interpreter of sorts, using a computer as my medium.

## 2. Background

Visual art has been a part of humanity for a very, very long time. It has always been a space to explore different mediums, both to put the art in (canvas, paper, cave walls), what the art is made of (oil-based paints with dyes, objects, the shadows those objects cast), and the tools to make it (hands, fingers, brushes, industrial machinery, and computers). It only took a few years since computers became generally available to the general public in the 1960's for computer-based generative art to be created. Several artists are considered the pioneers of this field, many of which served as inspiration for my portfolio of works for this course.

### 2.1. Vera Molnár

Vera Molnár was born in Hungaria in 1924. After studying aesthetics and art history in the Hungarian University of Fine Arts, she moved to Paris. In 1960, she began making drawings following specific algorithms, a method she called “machine imaginaire”, or “imaginary machine”, referring to the fact she had not yet been able to use an actual computer for the task.

In 1968, she finally got her chance after asking the head of computing at Paris University if she could use their computers to make art. Their reaction was one of confusion, Molnár recalls, and was later told by them that the reason she was granted her request was because of a famous quote:

I completely disagree with everything that you are saying but will defend until my death your right to do or say or write what you have in mind.

— Voltaire

Her works mainly involve the composition of simple shapes— lines, squares, triangles. By using simple rules, influenced by random values, the end result becomes more than just the sum of its parts. She explores the blurry line between order and chaos.

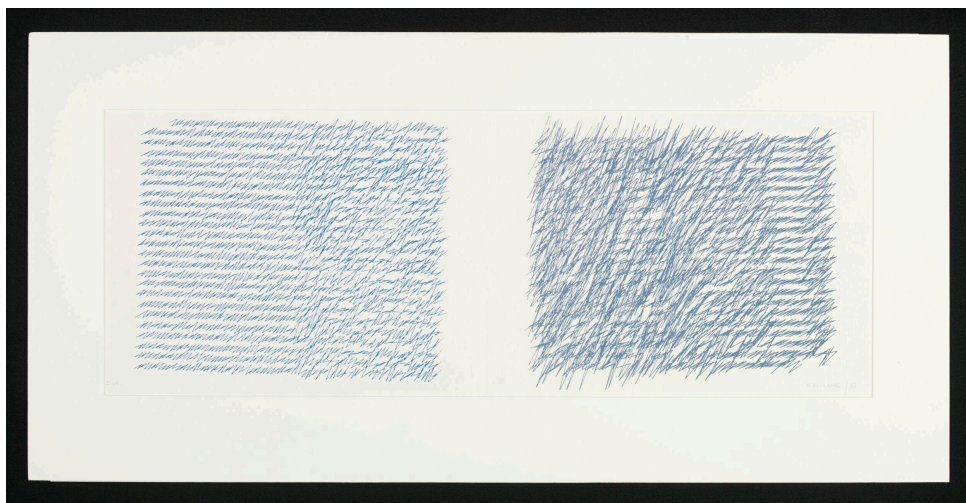


Figure 1: *Letters from my mother*, by Vera Molnár.

### 2.2. Manfred Mohr

Another pioneer in digital art, Manfred Mohr began programming his first computer drawings in 1969, after being encouraged by an electronic music composer friend of his.

In 1971 he showcased his drawings in the Museum of Modern art in Paris, by feeding precalculated data from a magnetic tape to a plotter. At that time it was not possible to have the computer make the art in real time, as they needed special air conditioning and would be unfeasible to transport to the museum.

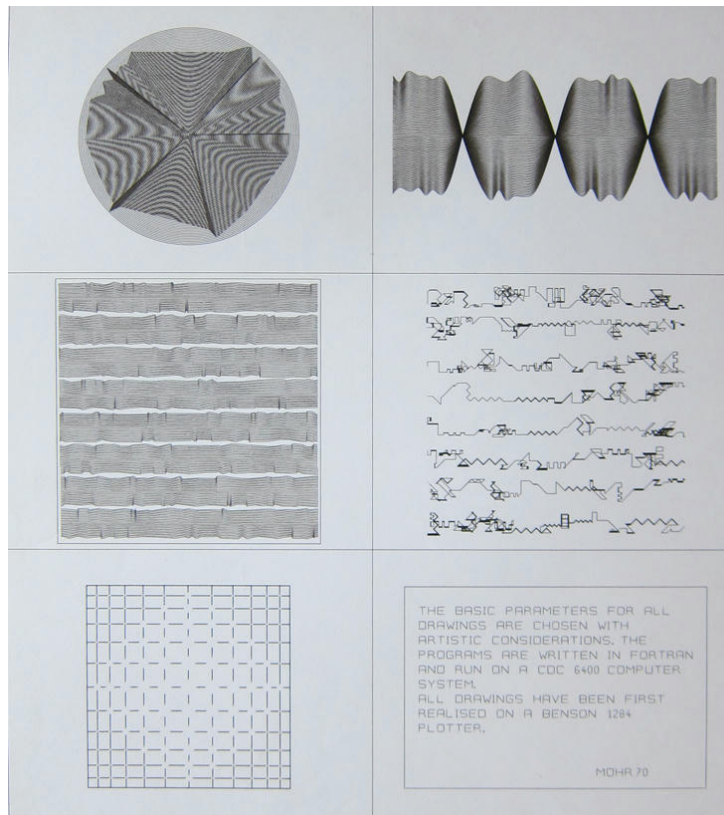


Figure 2: An example of the plots shown at Mohr's show from May 11 - June 6, 1971

### 2.3. Sol LeWitt

LeWitt took another approach to algorithmic art. Instead of using a computer as the medium to transform an algorithm to art, he used people.

In 1968, he began to create works of art by making instructions, sometimes accompanied by diagrams, and getting people other than him to follow these instructions. These works would always be done on a wall or walls of an exhibition or public space, being painted over or taken down after some time, to be reproduced elsewhere.

While the instructions do not explicitly include randomness compared to the previous artists' works, LeWitt introduces randomness in the way people interpret his guidelines. According to him, "each person draws a line differently and each person understands words differently."

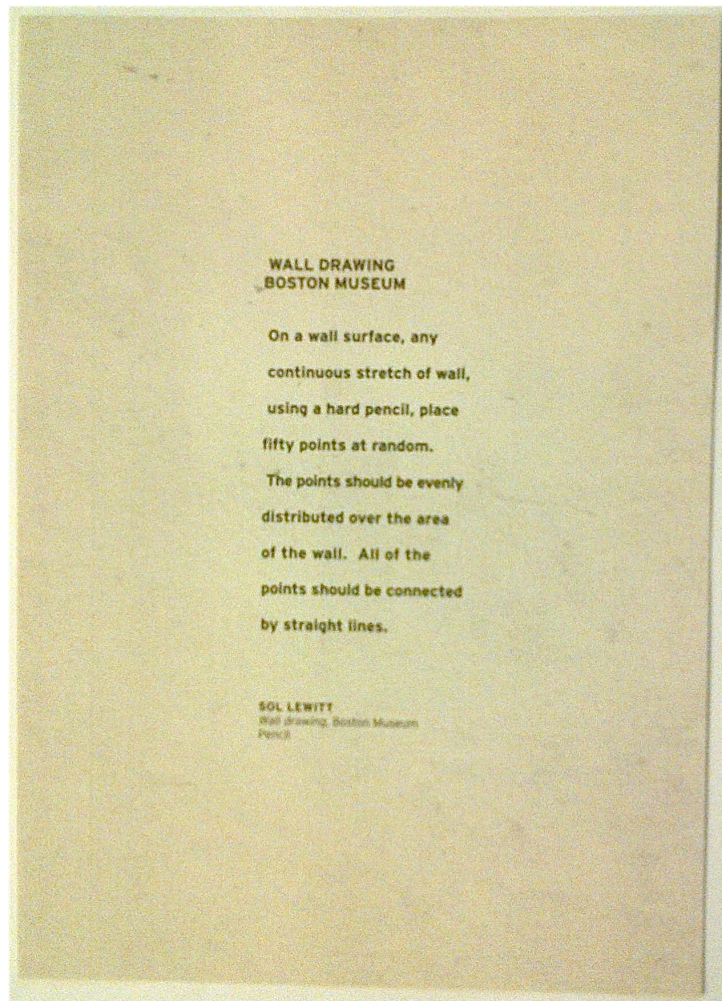


Figure 3: Instructions for making *Wall Drawing, Boston Museum* by Sol LeWitt

Even long after his passing, new works of his are being created. All it takes are the instructions, a couple people, and a wall.

## 2.4. Charles O'Rear

Charles O'Rear is a National Geographic photographer. In 1996, he took a picture of green hills in California. According to some journalists, it's the most viewed photograph in the world. It is the default wallpaper for Windows XP.

It is an iconic photograph, embedded deep in internet culture. I grew up with this picture. It reflects peace, serenity, bliss. I thought it would be the perfect setting for an art piece.



Figure 4: *Bliss* by Charles O'Rear



### 3. SoMoS

Like Sol LeWitt, I wanted to try and make the art a collaborative process, not just during its creation. To this effect, I created a platform that can use the audience's mobile devices to influence the piece, both in appearance and sound.

My intention was not only to make the piece more interesting, but observe how people would react to having direct control over an art piece, and the sound it makes. Would it make music? Would it be art?

#### 3.1. Implementation

The piece involves a webpage accessed from the participants' mobile phones, that records the device's orientation and acceleration information. This data must then be sent to and processed by a server. It is forwarded to the exhibition's computer, which uses this data to influence small artpieces and audio, each a 'sketch'. The exhibition cycles a set of these sketches periodically, keeping the theme of audience interaction.

The server uses Node.js with Express and websockets to serve the webpage and connect to clients. The exhibition computer is connected with authentication to ensure only one client can display the artwork. Participants can connect to the server freely, through a direct link or a QR code.

By using Javascript's native events, participants can interact with the work by touching the screen and rotating or moving their phone. The way it interacts with the artwork and sound displayed on the exhibition computer is determined by the specific 'sketch' active at the time.

In the turned in version, anyone can create their own instance of the artwork, and connect to with a QR code.

The sketch displayed on the main computer is a field, with generative hills. I implemented a day/night cycle by rotating around a sun and moon, and blending different colors in the background to create pretty lighting for the sky. At night stars fade in and twinkle as the moon moves. A pinwheel sits embedded in the grass.

For the sound, I used a custom polyphonic synthesizer for a background drone, that plays a series of chords. When the user taps on their phone, the next chord in the sequence is played. The pinwheel plays an arpeggio of the chord when spun, by blowing on the phone's microphone. Shaking the phone applies some force to the pinwheel which moves back and forth like a spring. Rotating the phone will change the time of day, applying a filter and changing the waveform of the drone synth.

The phone also has a sketch of its own, showing the phone's rotation with a cube at the center, and dots in concentric rings spinning around it as you blow into the microphone. The sketch has the singular purpose of showing feedback to the sensor data.



## 3.2. Screenshots

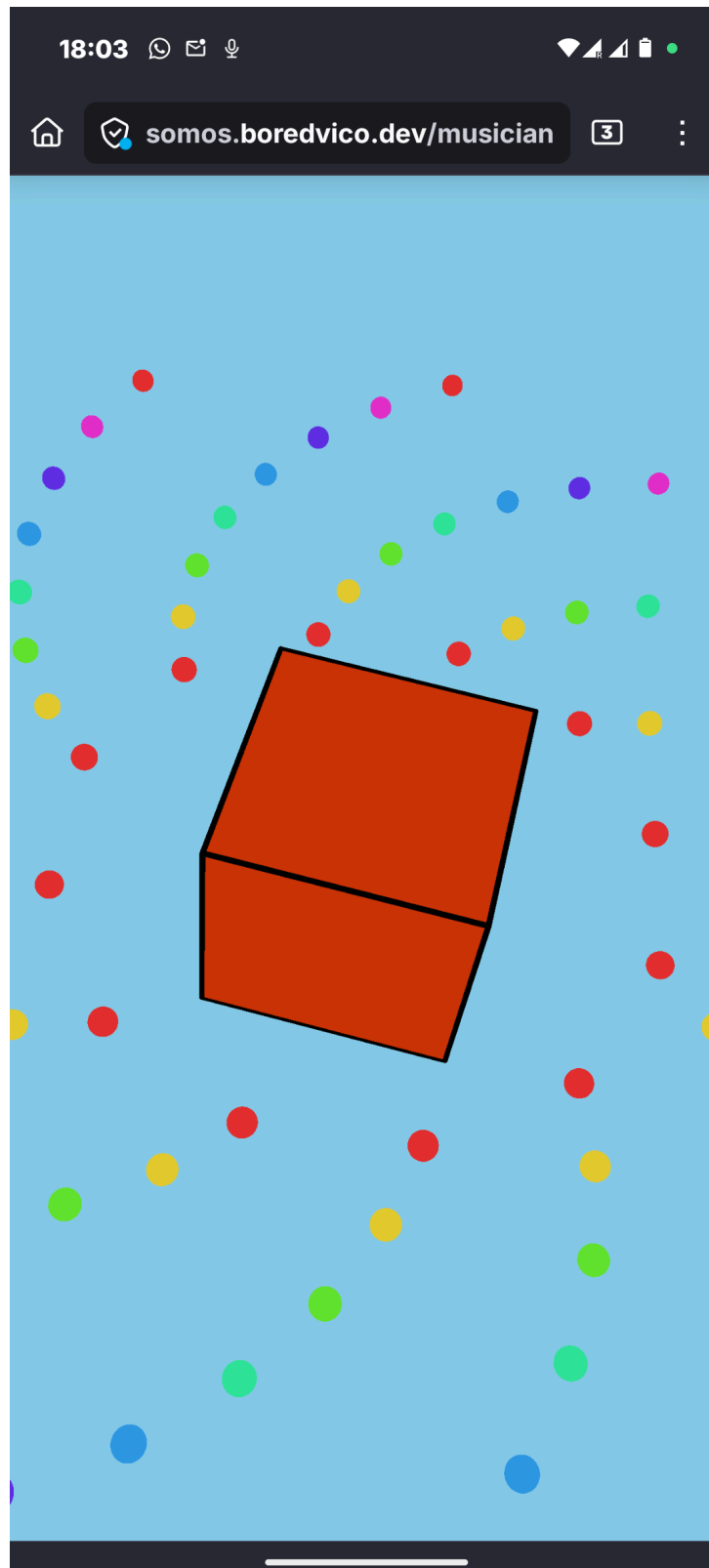


Figure 5: Phone interface

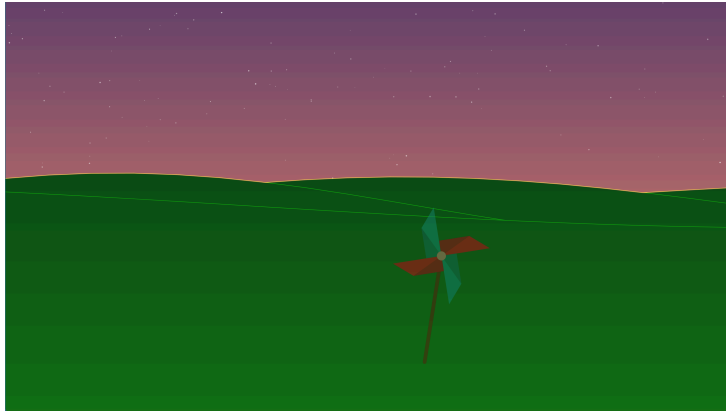


Figure 6: SoMoS main sketch

## 4. Conclusions

My original intention was to make a piece that would focus on the sound, placing a higher responsibility on the participant to create music. However, over the course of development the idea shifted into making an interactive art piece, focusing on the novel use of a phone to interface with the piece. While I don't inherently regret that, I would've liked to make an actual collaborative art piece like Sol LeWitt.

The exhibition was constrained by time and equipment. My laptop was only able to go so loud, and there were a lot of other people in the room making sound with their computers. I feel I was unable to fulfill the purpose of the piece, to give power to the audience to create art. However, I did make them participate in it, and that means something to me.

I saw other people's works implemented their inspirations more explicitly into their work. While I adapted some techniques of my inspirations, especially the use and transformation of noise, I took my own direction when it came to the spirit and intention of the piece. Most of the artists I used for inspiration in my portfolio defined their works by the algorithm used to draw them. I, on the other hand, started with a vision for a scene and used whatever means necessary to render it to the screen. Not a lot was 'generated', per se, rather it was drawn according to hard-coded specifications.