andy cavatorta
DESIGN PORTFOLIO

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Most of my art commissions are secretly design projects. And most of my design commissions are secretly research and development projects. I specialize in creating technical-social-aesthetic systems in unfamiliar disciplines.

The works include theatrical set designs, arcade games, a swarm of painting robots, musical instruments, adaptive architectural acoustics, kinetic sculptures, novel vinyl jukeboxes, graphical user interfaces, and more.

I call my design process Discovery-Oriented Design. It's a process for creating functional things that nobody knows how to make. The process requires theoretical subjects like math, physics, algorithms, circuit design, and systems. And it requires building an order of magnitude more prototypes than a typical design and development process.

This process enables my studio and me to constantly work in unfamiliar territory quickly and effectively.
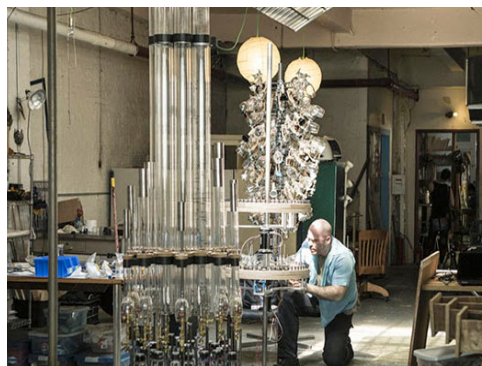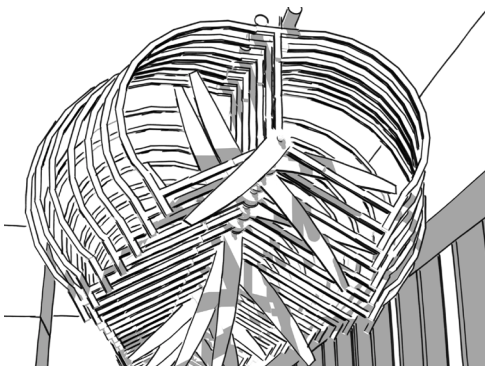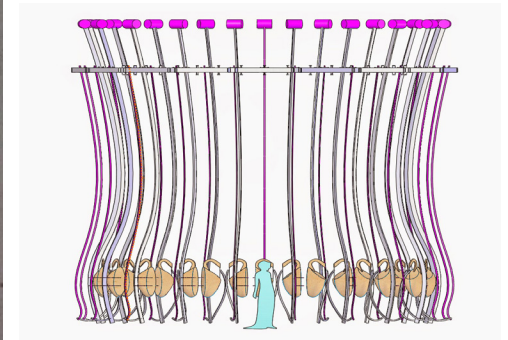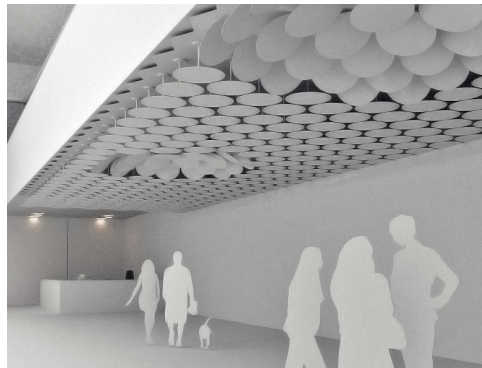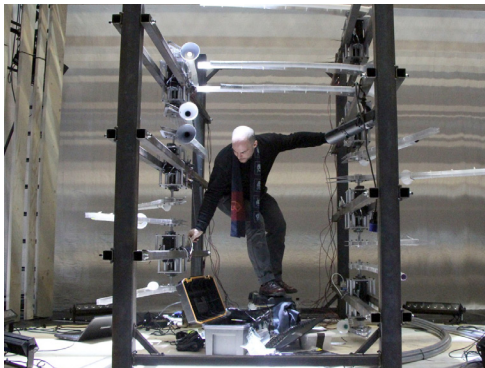
game design
DUAL COINCIDENCE

Dual Coincidence is a multiplayer electromechanical arcade game created as a commission for Museo de Banco de México (the museum of the central bank of Mexico). It is my first game design project and also the most complex arcade game in the world.

The client asked for something that would illustrate the Coincidence of Wants, an economic concept related to the dynamics and limitations of barter. I chose to create a game so visitors could experience the forces and dynamics themselves. And I chose to include pinball as *part* of the game because everybody knows how to play pinball even if they have never played.

I designed the game concept, the game's rules and choreography, the CAD models for the structures and mechanisms, the graphics, the circuits, and the software.

details: https://andycavatorta.com/dual.html
press: New Atlas
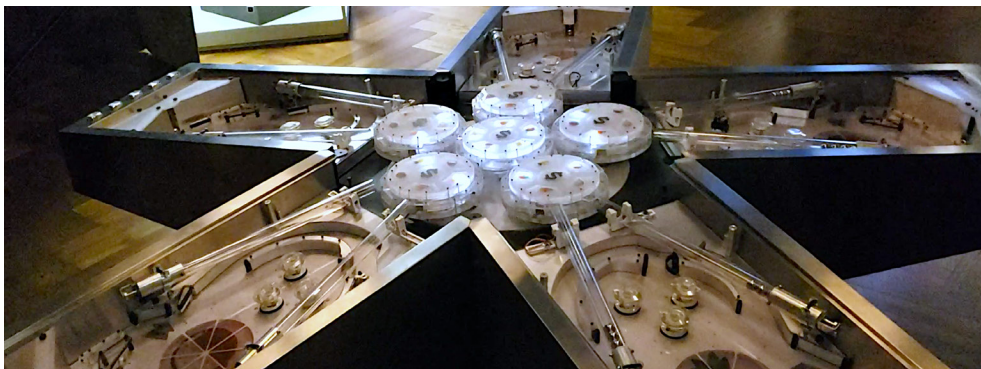
stage design
SHADOW PROJECTORS

My first set design project was a commission for a production by the Oslo Opera House and the performance company Winter Guests.

These two Microcosm Projectors tell the story of a train journey that changes everything and a forest where everything is full of living spirits but nothing changes.

This story needed magical light. I avoided the flickering, pixelated, commercial-feeling light of video projectors and instead built animated shadow projectors that contained tiny paper microcosms, bright incandescent bulbs, and enormous lenses.

I designed the concept, the content, the CAD models, the structures, and the mechanisms. I fabricated the projectors. And I directed the illustrators and animators who created the final images. One projector uses the coherence of light to create transitions without motion.

details: https://andycavatorta.com/shadowprojectors.html
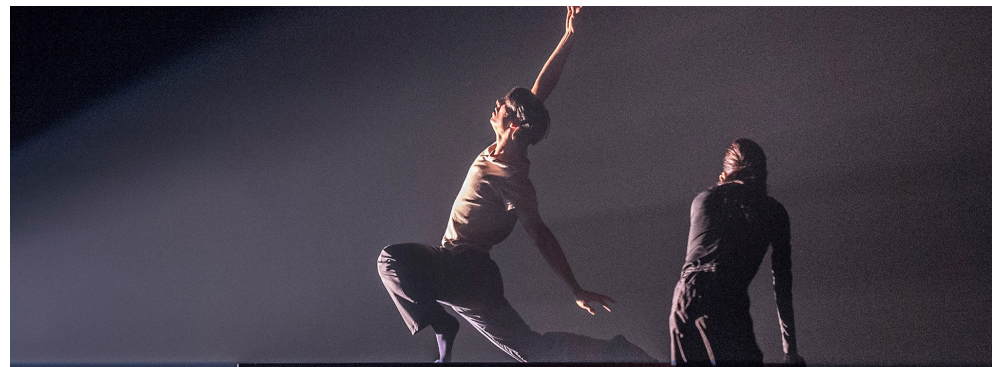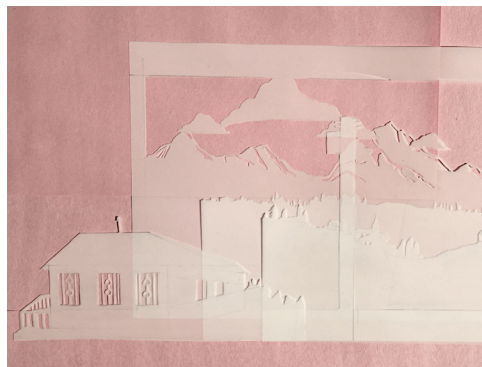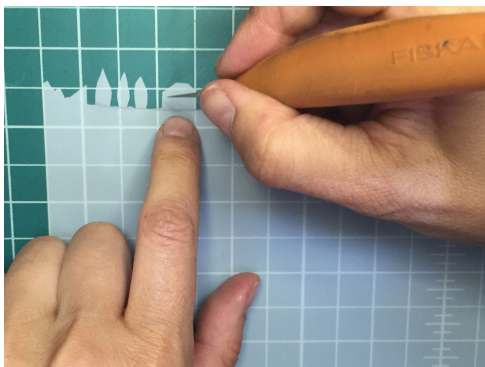
GRAVITY HARPS

The Gravity Harps are a musical instrument created in collaboration with Björk. They are my first professional musical instrument. They were featured on the Biophilia album and toured the world with her. They were also featured for four months in the lobby of MoMA.

This year-long collaboration produced dozens of concepts and prototypes.

details: https://andycavatorta.com/gravityharps.html
press: The New Yorker, Wired, When Björk Met Attenborough

human-robot interaction design
D.O.U.G.L.A.S

My first mobile robotics project is this swarm of 24 painting robots for Sougwen Chung. The concept of painting robots came from the client. I designed the forms, functions, and software that brought them to life.

This interactive painting performance was Chung's final project for her residency with Bell Labs. I designed, prototyped, and programmed the robots in five weeks. The software is 100% original, using no frameworks of any kind.

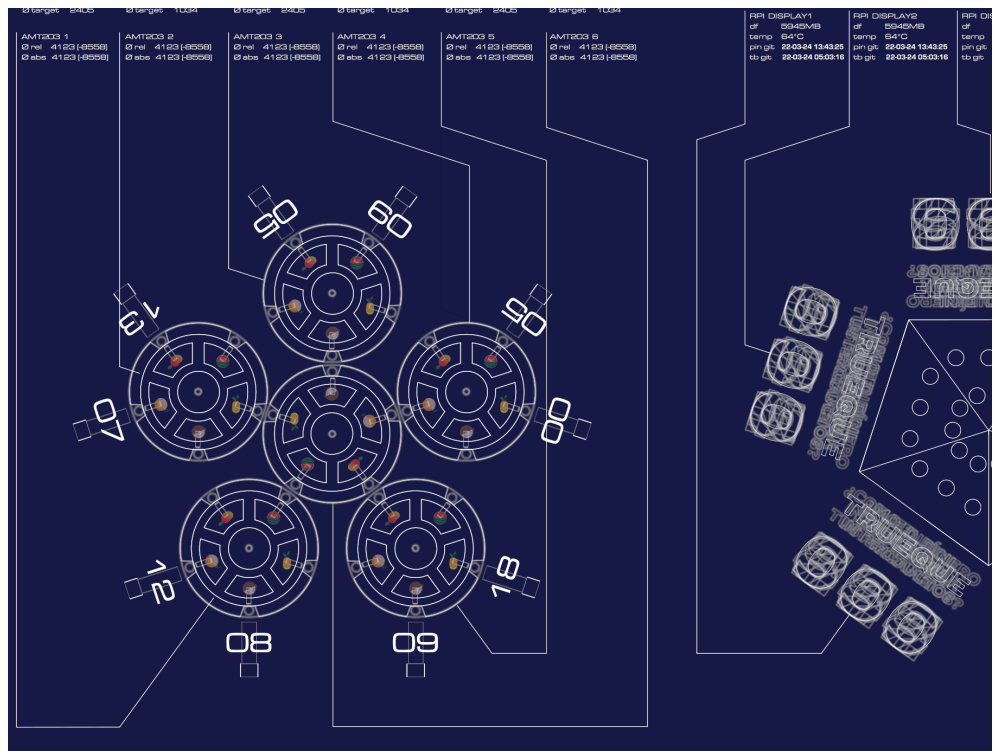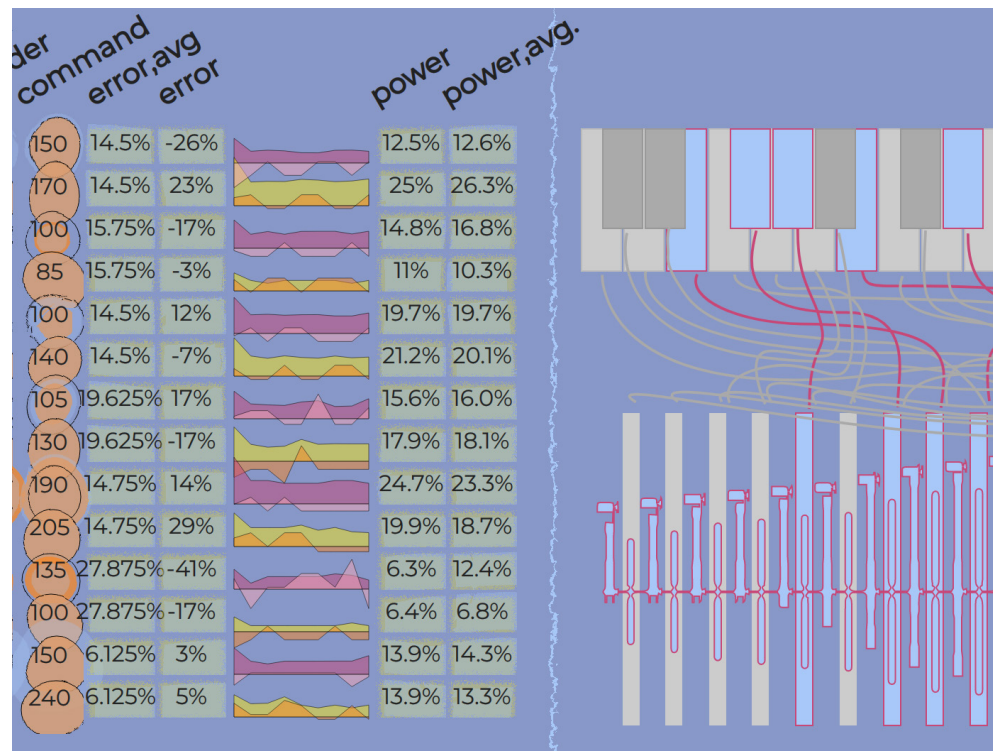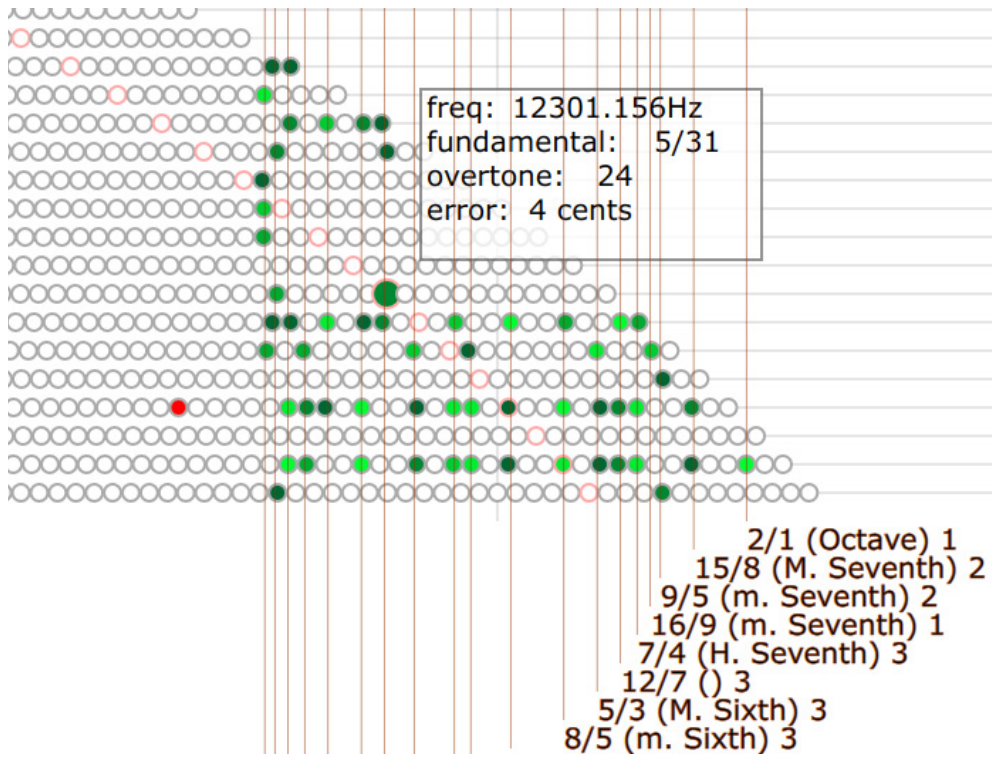details: https://sougwen.com/project/omniaperomnia
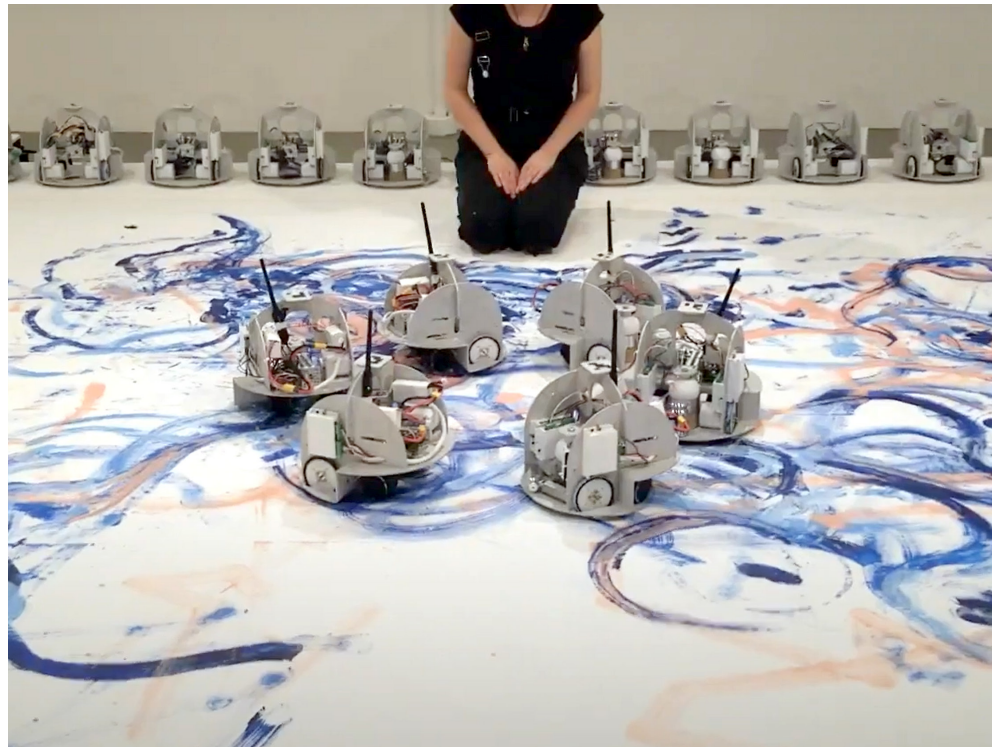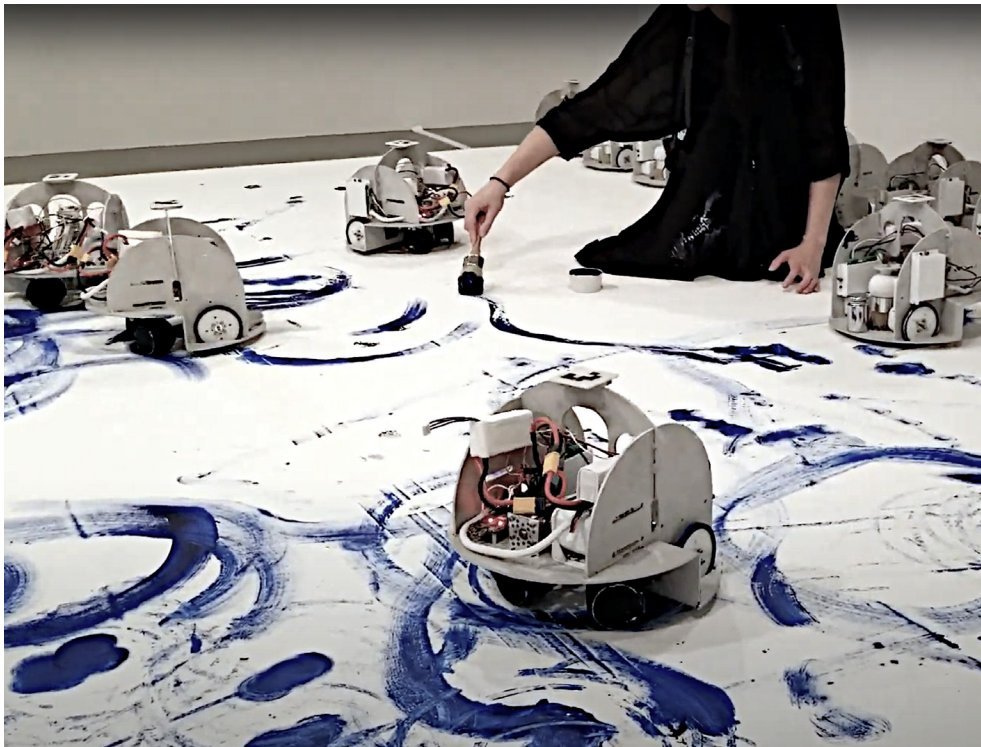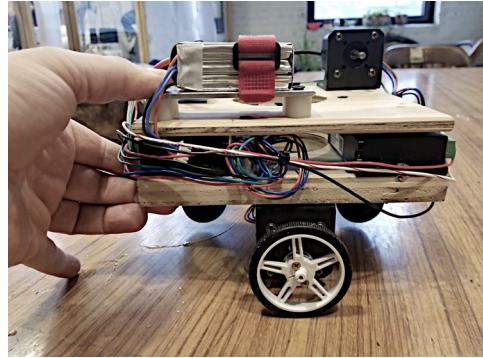
interface design

Many of these projects have unique GUIs for managing their distributed control systems.

There are many popular frameworks for Web-based interfaces. But I wrote the very first Document-Object-Model-based clients back in 2001 and still write each from whole cloth with raw JavaScript and its binding to the DOM.

Most Web GUIs I create today are built with SVG rather than HTML. They are blank SVG graphics that contain thousands of lines of JavaScript that create and operate the interface. They also usually contain two web sockets and the ability to read USB devices.

The best thing about writing these interfaces from scratch is that they can contain any type of interface devices or behaviors one can imagine.

industrial design
JKBX

Mother Industries commissioned me to design a jukebox for distribution in Brazil that also performs the elaborate Stella Artois 9-Step Pouring Ritual. My studio produced detailed sketches of aesthetics, mechanisms, processes, and experiences. The project went dormant when the Brazilian economy crashed in 2015. But I do still love the sketches and plans. And the proposed machine has a pretty great playlist. You're welcome.

instrument design
THE IRVINE

The Irvine is an artifact from a re-imagined history of electronic music in which electrophones are typical orchestral instruments. It uses six gallium phosphate crystals, 13 computers, and custom electronics to create three interconnected voices with different timbres and vowel formants. Its interface is loosely inspired by the Ondes Martenot but more expressive.

details: https://andycavatorta.com/irvine.html