A Synesthete's Atlas:
Real Time Cartography in Performance

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I'T'S COMING UP ON THE ONE-YEAR ANNIVERSARY OF the premiere performance of my *A Synesthete's Atlas* project, so *Cartographic Perspectives*'s invitation to reflect on how it came to be, and how it's playing out, is timely, apt, and welcome. As I draft this article I've finished touring it up and down Colorado's Front Range and am headed to the Midwest, where I'll give my **first museum performance**, among others.

A Synesthete's Atlas gestated through two artist residencies:[1] at Signal Culture, in the isolated, Rust Belt town of Owego, New York,[2] and at Hangar, in the vibrant, multicultural Graça district of Lisbon, Portugal. Hangar, a "center for artistic investigation," skews toward post-colonial and Global South artists, hosting eight international artists at a time, offering modest live/work spaces, a painting and sound studio, a wet darkroom, and a general-purpose performance space. Two top-floor studios offer always-inspiring views.

I arrived with three map-related projects I planned to work on. This article focuses on the one that evolved into *A Synesthete's Atlas*, but touches on all three.

An unfiltered view from Hangar's Studio 6. Sandstorms in Northern Africa caused the Lisbon sky to take on this color for a few days. Photograph by the author.

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1. Res Artis provides a searchable database of member artist residency programs worldwide at **resartis.org**.

2. **Signal Culture** has relocated to Loveland, CO, and is in the process of rebooting its studios and residency programs as I write this.

LESSONS LEARNED FROM EXPERIMENTAL FILM

THE ART FORM I'VE MOST CLOSELY IDENTIFIED WITH over the decades is experimental film. I'd loved cartoons since childhood, had, as an undergraduate, stumbled into *Trickfilm*, a multi-week festival of sophisticated international animation at the Art Institute of Chicago's Film Center, and yearned to find a venue for seeing similar work going forward. Chicago Filmmakers answered that call, and in so doing provided me with an informal introduction to contemporary and historical experimental film. My only formal education was taking a pair of animation courses at the School of the Art Institute as electives at the end of my undergraduate business school education at Loyola University Chicago.[3] Over the years I've made a handful of 16mm films and curated cinema programs for a variety of institutions, while also serving on boards of directors, and on grant-giving juries.

16mm filmmaking is expensive and error-prone, as were the other antiquarian media I chose for my own artmaking (copperplate photogravure anyone?[4]). Fast forward to the mid-2010s, by which time I'd taught multiple incarnations of *Mapping as a Creative Strategy* at colleges and art centers, and had been doing freelance development using open geographic data and open source software: the realization hit me that the tools I was using for web mapping were tools that could be used to create a peculiarly constrained form[5] of experimental animation.

I gave a presentation in Washington, DC, at State of the Map-US 2014 called "**Lessons Learned from Experimental Film**." After reviewing the notion of *structural film* (Sitney 1969), I talked about how one film (*Serene Velocity*, by Ernie Gehr) and three filmmakers' strategies (Paul Sharits, Robert Breer, and Paul Glabicki) might be interpreted using digital cartography.

Ernie Gehr's *Serene Velocity* (1970) is set in a long institutional corridor having a green-gray tint. The camera alternates between fixed zoom positions, four frames taken per position, gradually stepping from subtle differentials to what feels like being slammed from one end to the

Frames from *Serene Velocity* (1970). © Ernie Gehr. Image courtesy the filmmaker.

other of the long hallway. One of the interesting things about the film is that even with the strong depth cues the screen space can flatten completely as the objects along the hallway (illuminated hot spots and shadows, ash trays, doorways) realign and confuse the visual perception system. For my presentation I used TileMill to create a tileset centered on Washington DC's Scott Circle. The radiating avenues of L'Enfant's city design produced similar illusions to *Serene Velocity*'s when subjected to a progression of rapidly alternating zooms, increasing in range.

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3. To shed light on my abilities to write software, work with probability distributions, and analyze data, I'll note that I went on to get M.S. and Ph.D degrees in Operations Research from the Industrial Engineering and Management Sciences Department at Northwestern University.

4. Copperplate photogravure is an intaglio printmaking method used to produce high quality, continuous-tone photographic editions; its heyday was the late nineteenth and early twentieth centuries, but it continues to be practiced by artisans: **photogravure.com**.

5. My celebration of constraints derives from the Ouvroir de littérature potentielle (**Oulipo**); co-founder Raymond Queneau described Oulipians as "rats who construct the labyrinth from which they plan to escape."

Paul Sharits was a leader in the development of the color flicker film. Film frames of solid, saturated color might occupy the screen for 1/12th of a second before changing to a contrasting color. These optics, combined with repetitive soundtracks in many of Sharits's films, conspire to fatigue the eyes and ears, producing illusory colors and syllables.

Robert Breer's deceptively simple hand-drawn animations do many things well. One strategy used across his films was to create separate sequences of believable motions—a train conductor walking the aisle, validating tickets; a conical coffee cup rolling across a flat surface; hexagonal beams rotating on to and off of the screen—that carved out specific spatial expectations and behaviors. He then would interleave these sequences to create hybrid spaces with conflicting perspective cues.

Paul Glabicki, a generation younger than Breer, also created hand-drawn animation, but his were composed of dense diagrams, done in a technical drafting style, sometimes

Sequence from *Fuji*, 1974. 15 cartons de 10 × 15 cm. Crayons couleur, peinture à la bombe. 79 × 79 cm.
Courtesy: Kate Flax, gb agency, Paris

incorporating templates and Letraset rub-on type into scenarios of his own creation. Works such as *Film-Wipe-Film* benefit from repeated, analytical viewings. One strategy I'll highlight is his rendering of a recognizable object—the appearance of a simple chair, drawn in severe perspective—that then disintegrates into constituent lines that explode or slide down the screen, diminishing into smaller segments and points, vanishing completely, before cyclically reconstituting itself.

Unlike the *Serene Velocity* touchstone, I had no implementation to show for Sharits, Breer, or Glabicki. I proposed that Sharits' rapid color shifts could be applied to geographic layers,

that Breer's interleaving could superimpose different locations/rotations, and that Glabicki's polygonal deconstructions could dematerialize OSM's *relations* and *ways*.

At the time of SotMUS 2014 I was weathering the fallout from being encouraged to "quit my job and come work for" a certain studio. I delivered on the former; the studio did not come through on the latter. I'd been given a tentative start date and signed an NDA, but foolishly relied on a handshake agreement, not a contract. Devastating. I set aside my lessons learned from experimental film and lost a few years picking apart the lessons of what can charitably be called "pranking."

A FIRST IMPLEMENTATION

I'D HELD A FEW ARTIST RESIDENCIES, AND was familiar with researcher residencies, but it was a revelation to learn about the Toolmaker-in-Residence (TiR) program at Signal Culture. A unique opportunity, it seemed a perfect fit when I was ready to return to this project. I was awarded this residency in 2018 and 2019, each a two week stint.

As I've never had an organizational affiliation that gave me access to Esri products, my digital mapmaking stack has always been built on open source tools. In the timeframe discussed here, my preference for Leaflet coupled with TileMill/Mapnik (raster tiles) yielded to Mapbox GL JS coupled with hand-coded stylesheets occasionally supplemented by sessions with Mapbox Studio and Maputnik (vector tiles). At present I use MapLibre, a fork of Mapbox GL JS from when its licensing was at its most permissive. These toolchains were satisfactory for my freelance work but for my personal work I began to crave new ways to manipulate map styles and parameters: to quickly shuffle and surprise myself with color, zoom, bearing, pitch, labels, and movement. I

wanted rapid prototyping with options to **give up** control.

During my first Signal Culture TiR stint, I began working with Lemur. In the early 2000s, the Lemur was a high-end, multi-touch device for controlling musical instruments. The hardware was discontinued in 2010 but the software evolved into iOS and macOS apps that could be used to construct touch interfaces running on tablets or phones. Although the software company Liine gladly accepted my money via the Apple Store, it soon became apparent that I'd purchased abandonware. For example, the built-in editor was rendered inoperable simply by connecting an external monitor to my laptop.[6]

Still, I was able to cobble together hardware (iPad, MacBook Pro), software (Lemur, Mapbox GL JS, TinyColor, a few hundred lines of JavaScript), and data (metro extracts from OpenStreetMap converted to MBTiles format, *ad hoc* GeoJSON fragments) in order to develop proofs-of-concept for creating single channel, map-based experimental videos

6. **MIDI Kinetics** acquired Lemur in early 2023 and has plans to revive it.
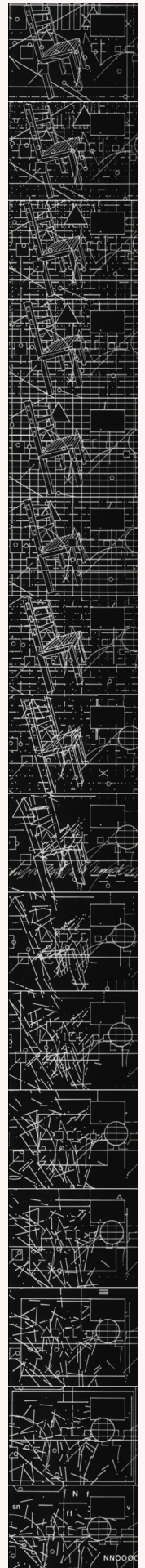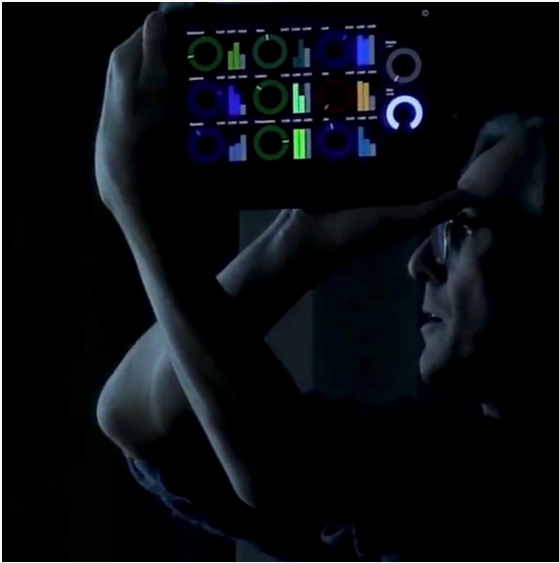
The author presenting the Lemur implementation of Carto-OSC at Cornell University's Kroch Library.

and the rapid prototyping tool outlined earlier. I presented these implementations at Cornell University's Kroch Library[7] shortly after my residency concluded. That audience—a mix of people coming from geospatial, filmmaking, arts and architecture, data science, and web technology backgrounds was supportive, inquisitive, and enthusiastic, and asked questions that I still refer to today as a reality check. I believe that the Cornell talk was where I first publicly referred to my platform as *Carto-OSC*, and first proposed using it for "map jockeying."

I had a handful of significant experimental film experiences during my first sojourn in Owego. Prior to my TiR I visited the Paul Sharits Collection at the Burchfield Penney Art Center Archives[8] in Buffalo. Videos I presented at Cornell were structured around maps whose rapidly changing layer colors were taken, via a Python script, from TIFF files of Sharits's *Frozen Film Frame Series* provided by the Archives. I began my trip by flying into Boston in order to attend the opening of *Introducing Tony Conrad: A Retrospective* held at both MIT's List Visual Arts Center and Harvard's Carpenter Center for the Visual Arts; Conrad being another flicker film pioneer as well as a minimalist composer/performer. And like any good experimental filmmaker I made a pilgrimage to the hallway at Binghamton University where *Serene Velocity* was filmed.

OSC THREE WAYS: SOUND, STAGE, AND CARTO-

I've not yet talked about how parameters set on the iPad touch surface are translated into actions that affect the appearance and behavior of the maps. You may have heard of the MIDI (Musical Instrument Digital Interface) protocol. It dates from the early 1980s and is used to exchange parameters between instruments, computers, and digital audio workstations. Your computer or mobile device likely "speaks" it natively, and if you own a digital keyboard instrument it almost certainly does. While Lemur could output MIDI, I found the protocol intimidating, and the note-focused (pitch, loudness, instrument, duration, modifiers) messaging not suitable for my purposes.

The author reflected in Paul Sharits's *Frozen Film Frame Series*, c. 1971–76, Burchfield Penney Art Center, Buffalo, New York, October 22, 2018.

7. Eternal gratitude to Keith Jenkins, Marsha Taichman, & Tre Berney for arranging my Cornell talk, which can be seen here: youtu.be/PXijK_q13do.

8. Eternal gratitude to Heather Gring and Tullis Johnson for facilitating my visit to the Archives. burchfieldpenney.org/public/documents/R2019.0806.001.pdf.

Sequences from *Film-Wipe-Film* (1983). © Paul Glabicki. Images courtesy iotaCenter and the filmmaker.

The OSC (Open Sound Control) protocol is of a more recent vintage and is more flexible in the types of messages it can send and receive, such that I could use it to send information that was not specifically musical. That it uses a URL-like namespace for its addressing was especially appealing to me as a RESTful API developer. What I mean by this is that a message such as

```
{
 address: '/label/country',
 args: [
  {
   type: 's',
    value: '[ Stoke-Regular,108.37, 0 ]'
  },
  { type: 'f', value: 108.37 },
 ]
}
```

followed by

```
{
 address: '/label/country/color',
 args: [
  { type: 'f', value: 313.3916 },
  { type: 'f', value: 0 },
  { type: 'f', value: 50 },
  { type: 'f', value: 0.5 },
  { type: 'f', value: 313.3916 }
 ]
}
```

can be sent from virtual controls on a touch surface via OSC and interpreted by software running on my laptop as a set of parameters for setting the font and font-size (in pixels) used for labeling entities in a country layer, and then altering its color using a tuple for HSVα (hue, saturation, value, alpha channel). Observant readers may be curious about the redundancy in these messages. The final line of the args array is the value provided by the virtual control. Carto-OSC acts upon the previous lines, implemented more naturally as a preArg where multiple controls provide input for multiple parameters.

By the time of my 2019 TiR I'd become aware of a JavaScript-based, open source alternative to Lemur called **Open Stage Control**, and much of my residency was spent reimplementing my 2018 work using that platform. Open Stage Control, developed by French percussionist Jean-Emmanuel Doucet, is remarkably capable,

The primary Carto-OSC panel with editor exposed. Screenshot by the author.
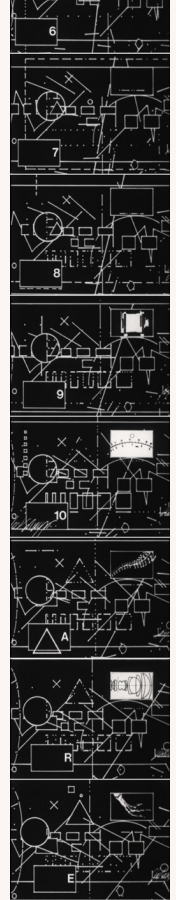
and is frequently updated in response to its active user base via a Discord forum.

The glue that holds Carto-OSC together has grown to a few thousand lines of JavaScript running in the web browser on my laptop. Incoming OSC messages are routed by address to individual modules that control the map style (e.g., `setPaintProperty`), the map movement (e.g., `flyTo`, `setZoom`), or the style of the HTML page into which the map is embedded using CSS margins, backgrounds, gradients, border-radiuses, et al. Some modules do very little and are only a few lines of code; others are rather complex and run to hundreds of lines. The router pattern makes it relatively straightforward to insert a new address and add complexity to the corresponding new behavior without adversely affecting existing, understood behaviors.

Carto-OSC served its purpose as a rapid prototyping tool for two short videos I released during the COVID lockdown: *If Map #7*, a tribute to the late media scholar, Gene Youngblood, that screened in the **Experiments in Cinema** festival, and *If Map #4*, an animated "poster" promoting an episode of the *Remains to be Streamed* Instagram Live program on the subject of film preservation.

FIRST PERFORMANCES

I'D WANTED TO RETURN TO LISBON EVER since my first visit in 1997, so when I learned about Hangar's International Residency program, I prioritized applying. I went with three map-related projects in mind: a series of sixteen short monochrome animations based on place names found within anagrams of the phrase "nonfungible tokens" (*If Map #9* and *9.1–9.16*), an experimental film in which older and younger versions of myself converse using Morse Code (*If Map #6*), and bringing Carto-OSC to fruition by giving a public performance.

The premiere performance of *A Synesthete's Atlas* was a collaboration with Helena Espvall, performing on cello and electronics, hosted in Hangar's performance space on April 21, 2022. About thirty people were in attendance: my co-residents, other local artists and gallerists, curious people from the neighborhood, and a few intrepid travelers who'd read about it on social media.

Three takeaways from that performance:

1. I learned more about the interaction of color in that fifty minutes than—with all due respect—hours spent with the Bauhaus-derived color-theoretic exercises of Josef Albers, Johannes Itten, Hans Hofmann, et al.

2. I was surprised by how my attention was allocated. I'd expected the majority of my energy would be spent manipulating map controls but my subjective impression was that 70–80% of my energy was devoted to listening to Helena's improvisations.

3. To my great satisfaction, the audience's attention, questions, and applause convinced me that there was, indeed, a "*there* there," that manipulating projected maps in dialogue with an improvising musician could produce a meaningful, non-narrative, pre-verbal experience for an audience.

Upon my return to the US at the end of June 2022, I gave three performances along the East Coast (Cambridge, Brooklyn, and Washington, DC) and another handful in California and Minneapolis in the autumn. Now, a year later, I'm touring Colorado and the Midwest, and beginning to line up another East Coast tour for the autumn, closing out 2023 with over two dozen performances in total. In post-performance Q & As, film curators have argued over whether my project is anti-cinema, post-cinema, or pre-cinema, and one geospatial colleague opined that "*A Synesthete's Atlas* sets a new bar for the notion of *radical cartography*."

Sequences from *Film-Wipe-Film* (1983). © Paul Glabicki. Images courtesy iotaCenter and the filmmaker.
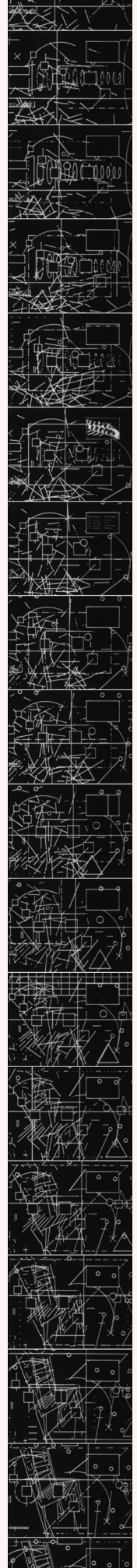
MORE ON THE *THERE* THERE

## CONCERNS, INFLUENCES, AND THE FEEDBACK LOOP

My overriding concern in these performances is color, particularly the subtleties of color perception and the freedom to apply unconventional palettes to geographic representations. Over the course of a performance I'll work with dramatic color differences—displaying saturated, "acid" colors in conflicting contrasts—and just-noticeable differences, where what might normally be thought of as foreground and background become indistinguishable or switch places.

There's a superficial similarity between the British painters Patrick Caulfield and Michael Craig-Martin. Both make use of constant-width black outlines and unmodulated expanses of solid color, leading unkind critics to call it "coloring book art." Caulfield's palette departs from the naturalistic in pursuit of atmospheric or emotional weight. In contrast, Craig-Martin's appears stridently arbitrary, yet harmonious. He often works on an architectural scale, creating room-sized drawings of common objects using black tape and painted walls. I study and take inspiration from both of their approaches to color, and my floor-to-ceiling projections allow the same impact as Craig-Martin's wall drawings.

But painters do not work in time-based media. The influence of Paul Sharits's color flicker films is especially visible when my projections are evolving quickly. I've come to see James Turrell's *Ganzfeld* installations as a referent when the pace slows. Turrell's installations, found at numerous museums worldwide, bathe viewers in slowly modulated colors and, due to their intensity and construction, the borders of the enclosing space—walls, floors, ceilings, even the portal for entry—vanish as the eyes try to make sense of the unfamiliar monochromatic, immersive, and unrelenting environment.

Sequences from *Film-Wipe-Film* (1983). © Paul Glabicki. Images courtesy iotaCenter and the filmmaker.
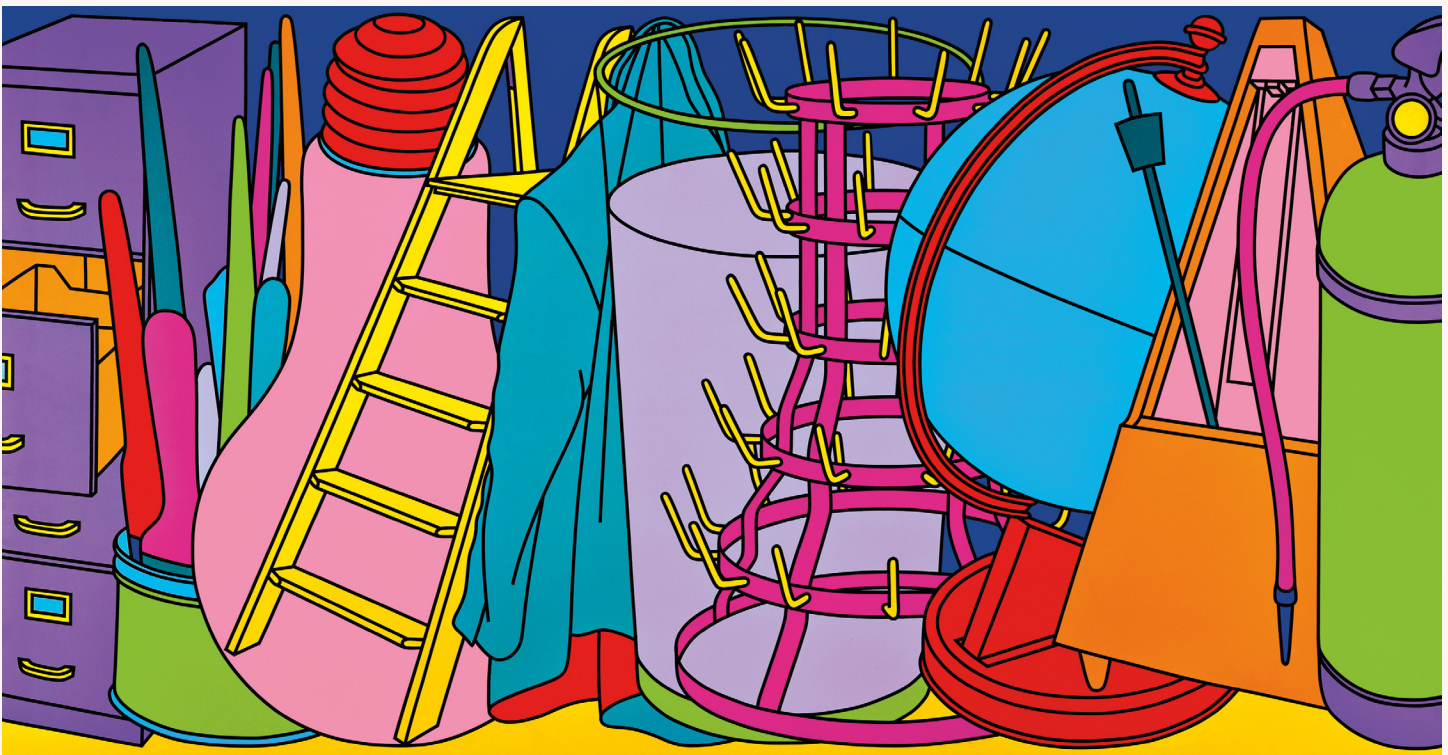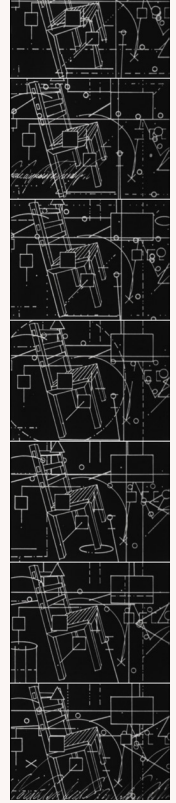
Full, 2000, Acrylic on canvas, 84 × 162 inches (213.4 × 411.5 cm). © Michael Craig-Martin. Courtesy the artist and Gagosian.

Like many artists, I lift inspiration from wherever I find it. I learned of François Morellet's grid paintings when one was installed several stories high on the wall of Dia Chelsea in 2017. Toying with this idea, I implemented simple, but effective controls that can alternate map rotation by dialed-in degrees at a slider-set pace.

I was too young (and too square) to have witnessed light shows at the peak of their popularity, yet through popular culture (television, most likely) I was aware of them and was fascinated by the lively, abstract visuals. Eyedroppers squirting colored liquids into transparent, fluid-filled trays set atop overhead projectors while loud psychedelic rock music blared. Slide projectors, 16mm film projectors, shutter mechanisms, strobe lights. *Visual music*, a concept whose organizing principle is that fine art should attain the nonrepresentational aspects of music, has subsumed the light show (Brougher and Mattis 2005, 7 and 148–178); also, media theorist Gene Youngblood considered the light show a form of *expanded cinema* (Youngblood 1970, 387–398). I see my work as following in those traditions and am gratified whether someone calls a performance "trippy," or goes into great detail about the relationship between my colors and movement and their own psychedelic experiences.

"Trippy" may be a proxy for another of my chief concerns: dislocation. During a performance, north is only occasionally at the top of my maps, water only occasionally blue. Through orientation and motion I strive to make the familiar less familiar. By muting layers and labels, and by working with data that's devoid of elevation, it's possible to let features from the natural or built environment appear as a child's scribble, a ganglion, a printed circuit or schematic, or an abstract painting come to life.

I worry that legible labels of well-known geographies will too strongly anchor a performance. The question of how to treat them was partially answered by my admiration for the letterform experimentation of concrete poetry, pioneered by the Dadaists, and visual poetry as practiced by contemporary poets such as Derek Beaulieu. As with painting, my inspiration comes from primarily static works, but my performances are deliciously complicated by the label placement algorithms built into any mapping library. Most *Cartographic Perspectives* readers will be familiar with the phenomenon of a label placement algorithm prioritizing a small town over a large city due to available space; this adds a good dollop of unpredictability and humor to the proceedings.

The author performing with Kevin Corcoran, textural percussion & manipulated field recordings, at Other Cinema, San Francisco, California, November 5, 2022. Photograph by Mai Adachi.

François Morellet, *Trames 3°, 87°, 93°, 183° (Grids 3°, 87°, 93°, 183°)*, 1971/2017, which appeared on the western facade of Dia Chelsea, New York City, from October 28, 2017 through October 31,2019. Photograph by the author.
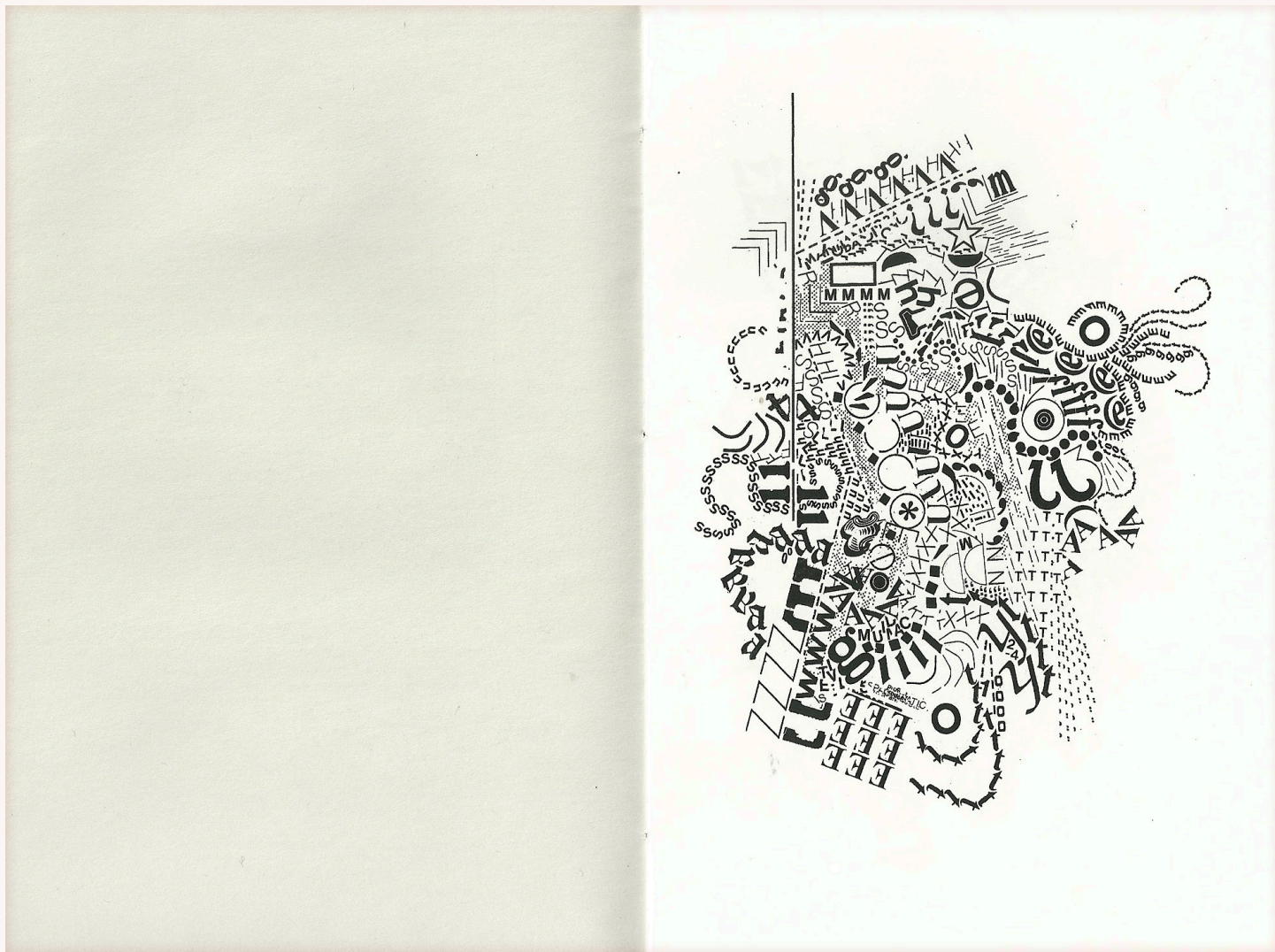
From *2 poems for Kristen,* by Derek Beaulieu (2009). *derekbeaulieu.files.wordpress.com/2017/01/beaulieu-2-poems.pdf*.

Carto-OSC has a tab where I can control fonts, sizes, colors, halo characteristics, and whether to lock the label to the map or to the viewport during map rotation. A number of decidedly non-traditional fonts have been turned into glyphs using the `build-glyphs` script included with Mapbox's `node-fontnik` package. These include redaction and barcode fonts as well as fonts representative of various styles, e.g., Art Deco (PollerOne), the Arts and Crafts Movement (Strong Glasgow), script (Zapfino), etc. I'm simultaneously excited by dynamic font sets and saddened that they're far from being drop-in replacements for web mapping glyphs.

FINDING VENUES & COLLABORATORS

There's a kinship between experimental film and music, and I've been in the audience for what's variously called new music, contemporary classical, free jazz, punk, and noise for decades. I've been fortunate to live in cities with thriving scenes and to have made friends with exceptional musicians simply by being a member of their audience. Oakland is home to percussionist Jacob Felix Heule's long-running monthly workshop for improvisers, *Doors That Only Open in Silence*, and Carto-OSC's early development was shaped by my sitting off to the side at sessions, imagining what I'd like maps to do in response to these spontaneous exercises in sound.

Naturally, it's different when traveling, especially with the gap in public performances caused by COVID-19. My typical approach, when faced with an unknown area, is to search the internet for venues that seem likely candidates (microcinemas, alternative art galleries, and performance spaces) for hosting a combination projection and sound collaboration, then begin making inquiries. I'm
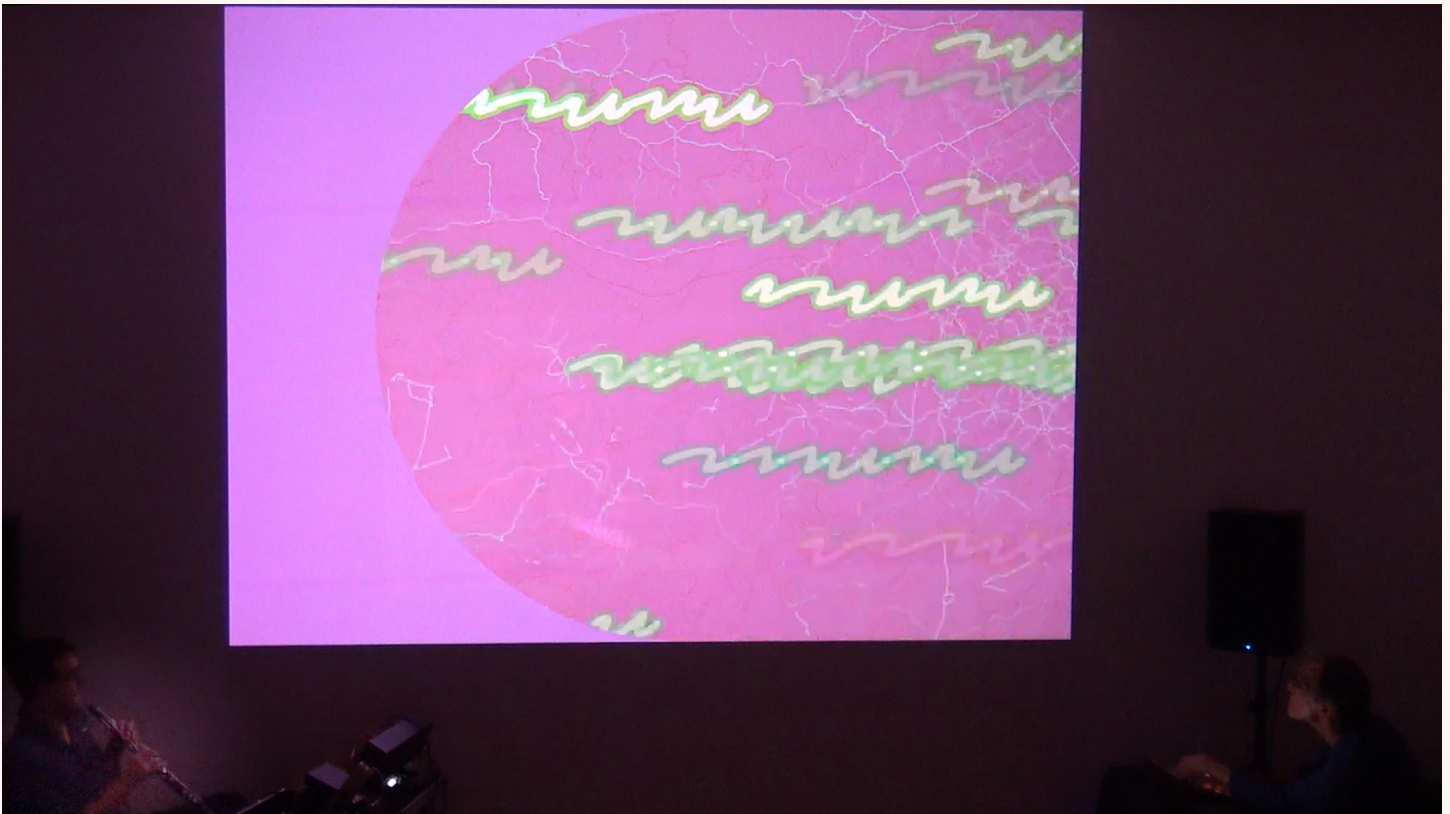
The author performing with Kyle Bruckmann, oboe and electronics, at Shapeshifters Cinema, Oakland, California, September 25, 2022.

aided by a small number of experimental film databases ("**Experimental Cinema: News and Resources**," "**This week in avant garde cinema**") holding historical venue information. It's rare that I don't record my performances, and my **Vimeo showcase** and **Instagram feed** allow venues to understand what I'm proposing.

As a venue commitment begins to come into focus, my attention turns to collaborators. I may know of someone by reputation or recommendation, but often the same search I use for venues will yield a list of potential collaborators. Ideally they'll have a Bandcamp or Soundcloud presence, or a portfolio of YouTube or Vimeo performances, and I can ascertain whether there's a potential match.

And then I send an email.

No one has yet said "not interested" to the idea; artists' fees or prior commitments are the usual reasons a collaboration doesn't proceed.

The economics of experimental film dictate a cycle of production cost, application cost, and then poor or even non-existent exhibition fees; it remains surprising to be paid for performing, whether on an institutional budget or for a share of what's collected at the door.

Even with performances at home it's rare to have the opportunity to rehearse. My collaborators and I either meet over a beverage or via Zoom and go over the possibilities and desired ways of working together. The subtleties come across in the video/audio documentation but the coarse "contract" my collaborators and I arrive at are worth unraveling. Instrument builder Krys Bobrowski adopted the approach of composer John Cage and choreographer Merce Cunningham: music and dance being separately composed, simultaneously performed, and merged only through the audience's perception. The duo of Jim Ryan (winds) and Darien Baiza (drums) chose to interpret my projections strictly as an unfolding score. In most performances there's a creative give-and-take between the visuals and sounds.

I do query my collaborators about what I've taken to calling *trigger geographies*: either specific locations or types (rigid street grids, fractal river deltas, points of interest that memorialize a person or incident) that might somehow impact or redirect their playing. Keyboardist Derek Gadalecia (a.k.a. Headboggle) ran the furthest with this

prompt; as he pre-records backing tracks in advance of a performance, he provided me with sixteen tracks, named after specific locations, a week ahead of ours. I investigated the geographies of each, added the visually evocative ones directly into Carto-OSC's *Destinations* tab, and used the others' names as springboards to other locations.

I ask similar questions of my collaborators regarding the impact of screen energy: how might changes in palette or contrast, aggressiveness of flickering, speed of rotation or oscillation, or changes in standard map parameters such as zoom level, pitch, or speed of interlocational "flight" affect their playing?

THE FUTURE THERE

TRUMAN CAPOTE FAMOUSLY SAID OF JACK KEROUAC'S *On the Road*, "That isn't writing; it's typing." I imagine there are people who feel the same about my performance cartography, although, thus far, they've kept mum. Cartographers in attendance have told me that my performances have made them excited to go back to work the next day.

After every performance, it's common to create a handful of self-assigned GitHub issues related to gestures I felt moved to make but had no interface with which to do so (I file bug reports, too). Small issues are addressed before the next show, medium ones might get a temporary hack with an eventual refactor. Epic issues—e.g., the ability to dematerialize polygons à la Glabicki—serve as fodder for future residency or grant proposals.

I love working with musicians who play acoustic instruments but I understand that contemporary electronic gear—loopers and other effects processors—has become standard equipment, requisite for a solo artist to perform for 40–50 minutes. Thus far I've worked with three exclusively electronic artists: sampling pioneer/laptopist Carl Stone, the aforementioned Headboggle, and modular synthesist Brett Darling. My imagery is, frankly, well-suited to electronic and dance music and I anticipate the day will come when I'll collaborate with a DJ over beat-driven music in a nightclub/rave setting. And while I presently use OSC only to exchange messages between my iPad and laptop, coding time is the only obstacle to extending this to a network of musicians and their instruments. The ability to simply sync tempo would have immediate advantages but allowing notes/sounds to drive map parameters or map gestures to trigger musical events opens interesting new possibilities. I enjoy the actual playing too much to let Carto-OSC devolve into a plug-and-play visualizer/screensaver and hope to one day have the luxury to write these extensions during a residency at an electronic music laboratory where the pool of talent and experience is deep.

While I'll always perform in scrappy, DIY, underground venues, booking more museum- and university-hosted performances will help keep this project sustainable through guaranteed honoraria instead of door splits and by committing experienced staff to publicity, outreach, and stage tech. With dozens of performances behind me I'm beginning to skim the cream of Carto-OSC improvisations to create animations to be displayed as public art at the scale of New York City's Times Square or London's W1 Curates, and to produce portfolios of works on paper. Other hopes for the future include working with spoken word artists—slam-style poets seem a natural match—and choreographers. Finally, once Carto-OSC is a little less feral, it's possible I'll open source some or all of it so that designers having more traditional narrative and/or data visualization requirements will be able to make productive use of it.

EPILOGUE

ALTHOUGH THIS ARTICLE IS APPEARING IN THE SUMMER of 2024, it maintains a spring 2023 perspective. I take sole responsibility for the many delays and commend Daniel Huffman, Nick Bauch, and Jim Thatcher for having patience exceeding Job's. The only significant change to my stack has been a switch to Brandon Liu's Protomaps (**protomaps.com**) for serving tiles; it's been liberating. Performances continue, with northern European dates coming together for July–October 2024. In the be-mindful-what-you-wish-for department, I'll be creating an atlas of screenprinted maps based on performance highlights during September and October at Amsterdam's AGA Lab, and my 10 minute *If Map #5* looped atop San Francisco's Salesforce Tower throughout February of this year as part of their Midnight Artist Series.

ACKNOWLEDGEMENTS

If, as it advanced, the countermap's counter twirled the map around and down, spiraling out from Salesforce Tower to Bolinas as unwaveringly as the boléro. (If Map #5) on the second tallest building west of the Mississippi River, San Francisco, California, February 2024. The Salesforce Tower Top art project is a partnership between Jim Campbell Studio and BXP/Boston Properties.

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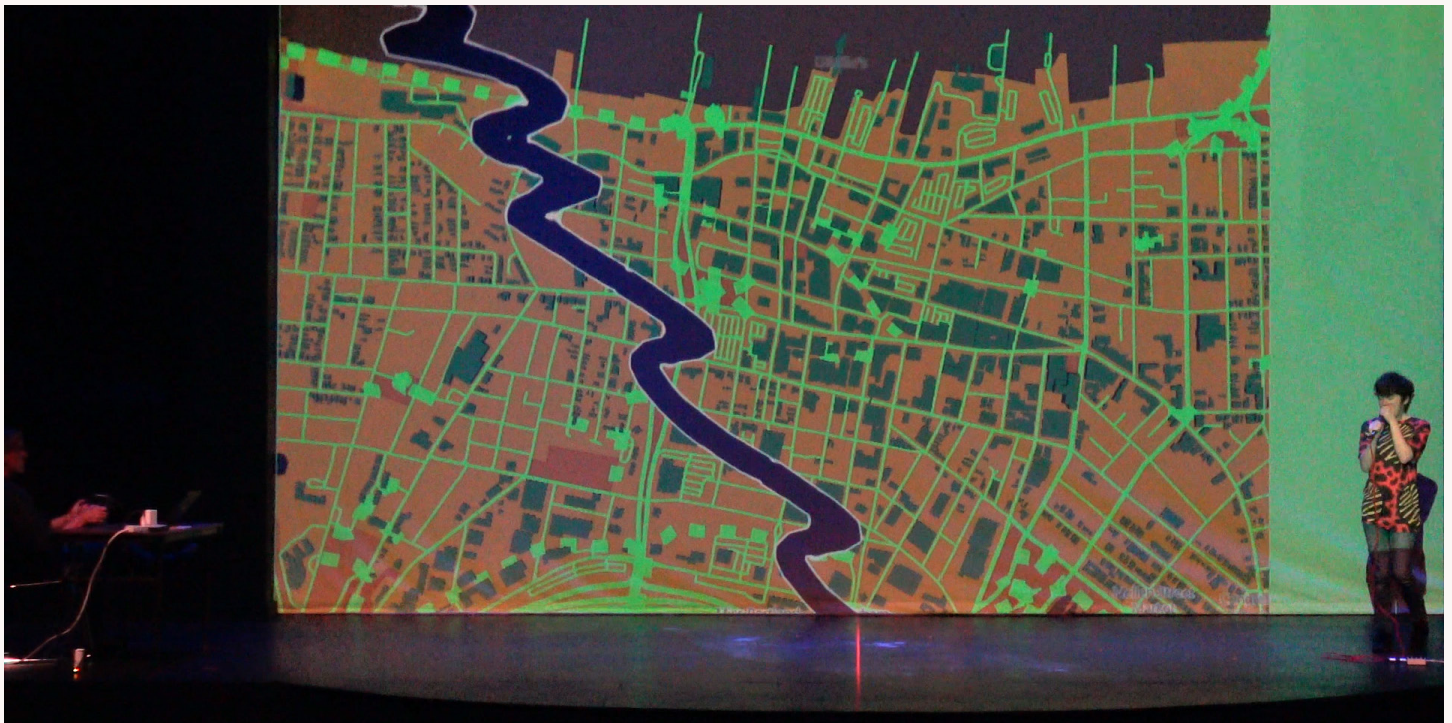
The author performing with The Asthmatic (Sigrid Harmon), voice and electronics, at Russell Hall Theatre, University of Southern Maine, Gorham, Maine, October 2, 2023. Performance sponsored by the Osher Map Library and Smith Center for Cartographic Education, and the Department of Theatre at USM. Many thanks to Libby Bischof, SeifAllah Salotto-Cristobal, and Matthew Edney.