

300 Days with Plotters



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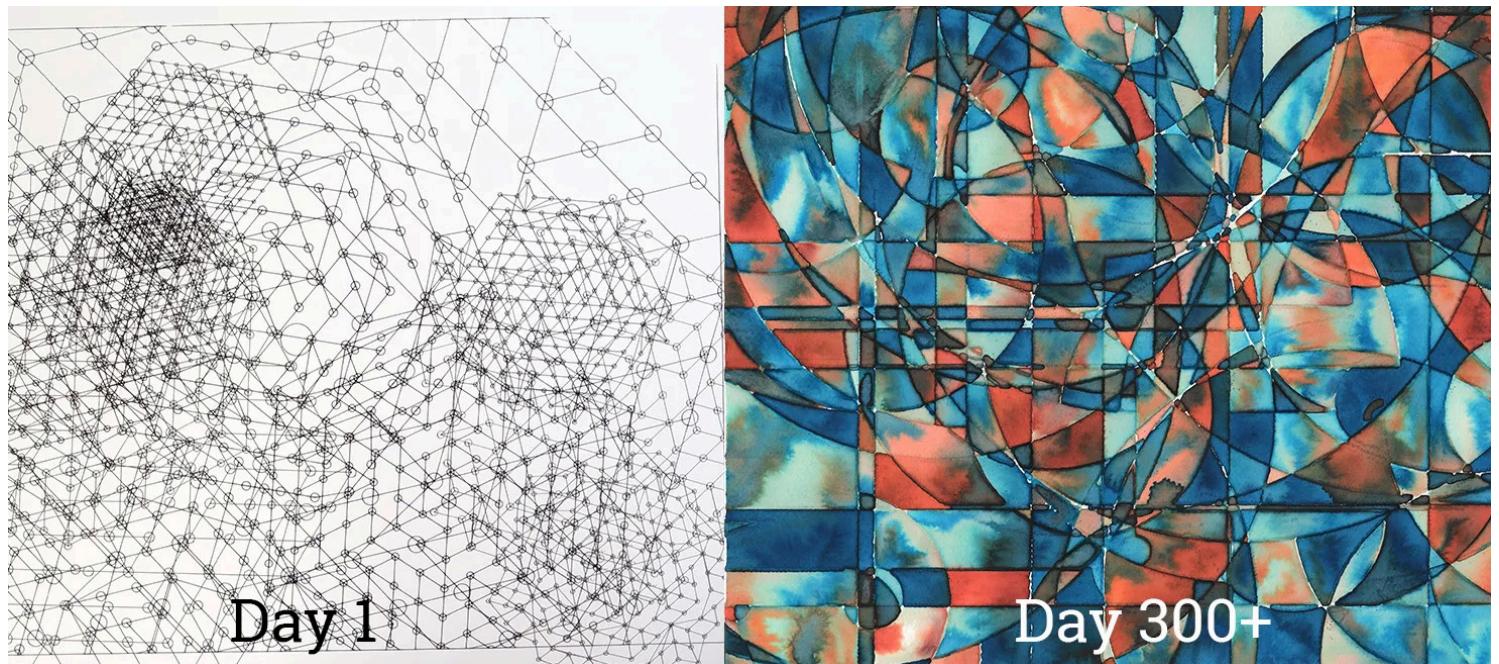
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Left: "Untitled", pen on paper | Right: "?I REALLY LIKE YOU MARY.", watercolor on paper

On Oct. 1st, 2019, my first AxiDraw plotter arrived. I was looking for some motivation to try it out, and it happened to be Inktober. The rule was simple: create something every day and share it. Filled with enthusiasm for my plotter, I decided to give it a try. My expectation was not high because repetition was not my forte. Despite trying many similar habit-building challenges in various topics (painting, sketching, workout, drink more water, you name it), I could always find excuses to let them go.

But my plotter journey was different. I finished the 30-day challenge without a hiccup and wanted more. I extended the challenge into a 100-day challenge and FINISHED it. After the first 100-day challenge, I continued my plotter journey by starting my 2nd, 3rd, and 4th 100-day plotting challenge. So far, only the 2nd one failed (because COVID-19 created too much stress in March).

For me, making art every day for 300+ days is a life-changing event by itself.

Making generative art for 300 days is another dream that came true. It gave many unexpected benefits to my art practices and even to my research career. In this article, I want to summarize a few things I learned during these 300+ days. I will start with an introduction to my art-making practice, then move to more high-level thoughts.

Building Your Tool

I started making generative art several years ago using javascript and [D3.js](#). At that time, I was teaching D3 and naturally developed all of my procrastination projects with it. Besides being an excellent data vis library, D3 taught me how SVG works, particularly how <path> works. During my first 10+ plotter days, I was nonetheless unhappy with my javascript art-making pipeline. Generating intricate patterns took a long processing time. I also had to save and manage the results semi-manually. Thus, I decided to move to Python, which is the language that I use most frequently in my work.

The beauty of Python is that you can find tons of libraries. Usually, the wheels are there, and you need to assemble them. For instance, I built my SVG-generating pipeline with [BeautifulSoup](#), an XML manipulating library popular for web content analysis. [The Clipper Library](#) is another wonderful library that I would recommend to everyone who needs to manipulate polygons.

Although developing the entire graph-generating pipeline took some time, it rewards me in many ways. The developing process gave me an in-depth knowledge of individual graphical elements. When I started, I construct my images with polygons and lines because they are the most straightforward elements to code. Working with a limited graphics library forced me to look deeper, searching for new ideas in these simple elements. As my visual language grew, I also extended my toolkit. For example, I added more curve-related functions, shape-filling algorithms, and various noise generators. Coding all of these features from scratch gave me a greater understanding and control over my image. More importantly, having a fully extensible pipeline is liberating. Knowing that I can add and modify *anything* gave me far more satisfaction than I expected. Once you build one tool, it becomes addictive. Besides my graph-generating pipeline, I also made tools for processing, organizing, and naming my artworks (how else can I manage so many uploads?)



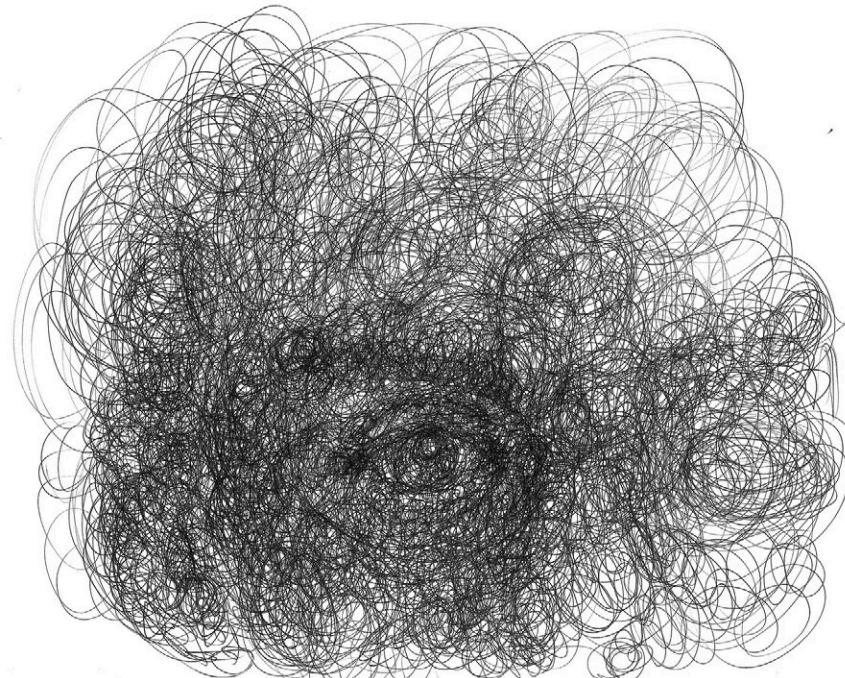
In the early days, my works play with simple shapes like polygons and lines. Title: "BIG DEAL AND GUS — WHEN YOU SENT THE TELEGRAM?", watercolor on paper



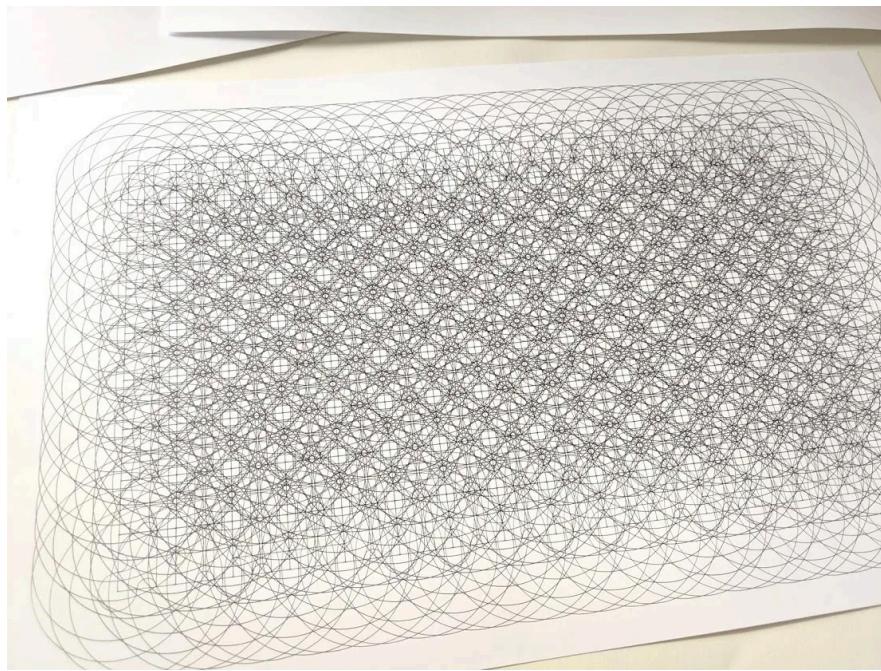
I gradually added curves into my toolkit. Details of the painting: "I'M SORRY! I DON'T KNOW WHAT TO DO NOW THIS IS IMPORTANT", watercolor on paper

Finding Your Medium

Like many plotter artists, I started collecting pens and markers when I began my plotting journey. Despite my growing pen collection, I found the lack of "me" in many of these paintings. They seem to be missing some signature strokes. I started to reflect on my art practice during this period. I realized color and spontaneity are part of me. Plotters are marvelous at making precise strokes, and fine liners reinforce this precision. Although there's undeniable beauty in this accuracy, over-relying on machine accuracy deviates my work from my style. In short, I am in love with chaos and bold strokes.



This is a doodle I did in 2016. I love finding balance in chaos. Over-relying on machine accuracy deviates my works from my style.



An earlier work that focuses on precision. "Untitled", pen on paper

There are multiple ways to introduce spontaneity to plotter work. One approach is to generate patterns that look natural. There are two articles on this topic that I enjoyed reading. "[How to make generative art feel natural](#)" [by Ben Kovach](#) and "[Intellectualism Hurts Generative Art](#)" [by Tyler Hobbs](#). Shifting my focus from *algorithm* to *art* helped me tremendously. Instead of being obsessed with optimization or fancy equations, it is more important to analyze how the image looks and feels.

Playing with different art materials is another approach I took. After a week of plotting with pens, I started experimenting with eyeshadows. Yes, eyeshadows. I imagined they would work like pan pastels (and sparkle!), but I was wrong. They were a lot less pigmented and not designed to adhere to non-skin-like surfaces. Painting with them by hand requires a lot of patience. I put my plotter to the test, and the result was much better than I imagined.



Trying to paint with eyeshadow. You can see a short clip [here](#). “Untitled”, eyeshadow on paper

Once I wrote the pipeline to test eyeshadow paintings, I played with other materials. For example, I tried wall paint, acrylic, and ink. These experiments happened during my first 100-day challenge, but I did not explore further during this period because I found something even more exciting: *thread!*

I was enthusiastic about punch needle embroidery (See Amy Oxford and her classic punch needle textbook if you are interested) in the winter of 2018–2019. However, it was challenging to fit the practice into my current life because it is time-consuming. Seeing my axidraw in action made me realize that plotters can perform all the necessary motion required by a punch needle embroidery stitch. I started playing and experimenting with different materials and settings, which eventually turned into a publication and an open-source toolkit.

Thread Plotter



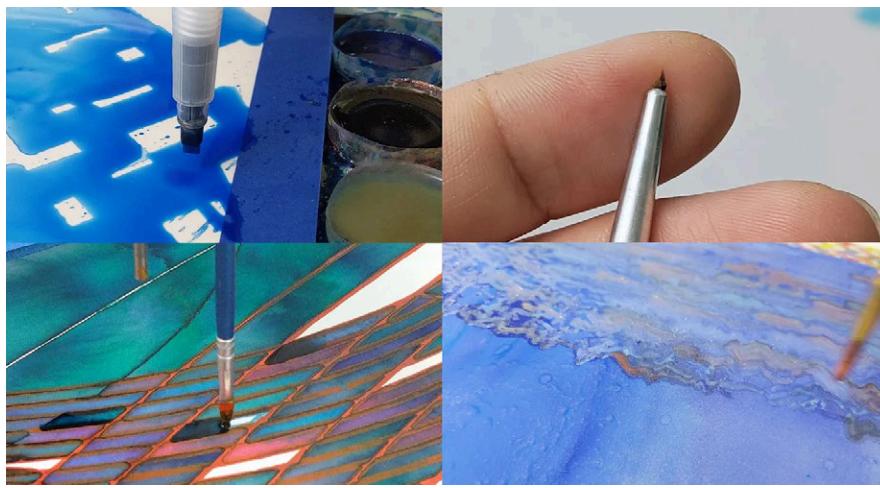
[ThreadPlotter](#) is a toolkit for the design and fabrication of delicate punch needle embroidery using X-Y plotters. If you want to learn more about it, I recommend [watching this 10-min presentation](#).

My 2nd 100-day challenge failed in March because it did not feel like the right time for me to make art (or to do anything, really). In May, I decided to start painting again but was not expecting a daily routine. Nonetheless, I did a watercolor painting (by hand) with gold paint. It started as a random doodle, but I got obsessed, so I spent the whole weekend on it. It brought me so much joy that it almost became spiritual. I realized that art has always been an escape for me, and it is **ALWAYS the right time to make art**. Therefore I resumed my plotter painting experiments and started the 3rd 100-day challenge.



The watercolor painting that started my 3rd 100-day challenge. "Untitled", watercolor on paper.

Painting with watercolor is instantly gratifying. Observing how different colors interact with each other is the most enjoyable part of the entire painting process. Because the painting processes were so joyful, keep painting was not a burden at all. I also developed a set of strategies and preferences for my tools along the way. For example, I found the brush that I like, learned the optimal way to stretch watercolor paper, found the method to finish a painting. Additionally, painting with a plotter gave me chances to play with more art supplies. I have tested different papers (yupo paper, watercolor paper, printmaking paper) and ink (I posted several color swatches like this). The trials and errors in these material tests are exceptionally rewarding. You can read more about my painting process in this interview with Michelle Chandra.



I enjoy trying different art supplies. Top left: [water brush](#). Top Right: [a tiny brush that I use in most of my paintings](#). Bottom Left: [painting on watercolor paper](#). Bottom Right: [painting on yupo paper](#).

Finding Your Way Back After A Break

Although I work on these 100-day challenges, I do not paint every single day. There are going to be good days and bad days. When you are traveling or having six zoom meetings in a row, it is ok to pause. In the 1st 100-day challenge, I paused for about three weeks because of holiday traveling. In the 3rd and 4th challenges, the longest break I took was about a week. *The issue is that many (including me) would struggle to get back.* I found the strategy described in the book “[Daily Painting](#)” by Caro Marine to be useful.

Essentially, you want to make some “backup” paintings in advance, so you have the quota to pause during these bad days. Having a quota for art sounds like an odd idea initially because art-making shouldn’t become a task.

Nonetheless, this mindset is excellent at keeping me on track: my painting reservoir is running low, I should make something. Also, on these bad days, I try not to pause completely. I usually flip through my paintings and give self-critiques.

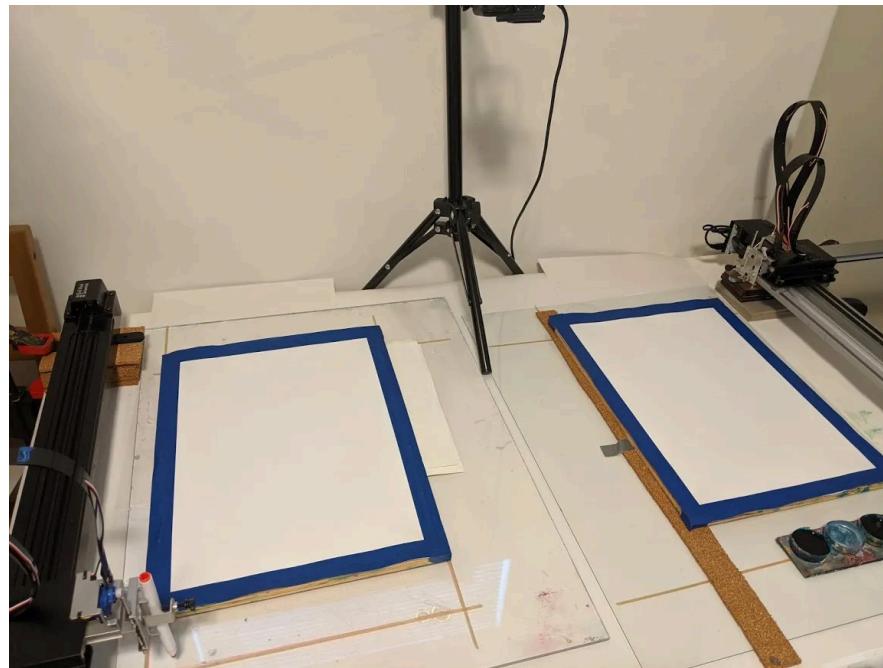
Social media also helped me to get back after a break. In my posts, I always include a progress indication (1/100, 2/100...100/100) because breaking a streak would cause a certain level of discomfort. Through SNS, I also got to know many amazing artists who inspire me and support me. Therefore, I am grateful to have these channels to share my art. Of course, social media is a double-edged sword that sends misleading signals and traps too much attention. I often have to remind myself not to let SNS be the judge of my work. Likes and views are often controlled by uncontrollable factors instead of my work’s quality or the joy my art brings to me. Tyler Hobbs recently wrote an insightful essay on this topic that I enjoyed reading.

Quantity is Important

I am a prolific artist. When I am concentrating on art, I usually am fast at coming up with ideas. Nevertheless, before I had my plotter, most of these ideas have to sit on my to-do list, waiting for the next weekend or holiday.

When my plotter arrived, I suddenly had a diligent friend who could help me bring my vision to life. I was running it as much as I can. I would even get up extra early to start a new painting in some of the early days.

In my 3rd challenge, I suddenly had a very long backlog because watercolor paintings take a longer time to make compared to markers and pens. Instead of optimizing the plotting order to save time, I randomized orders or even added pause time to achieve a certain mixing effect. A painting could take 12-20 hrs of plotting time. I decided to invest in another plotter. The 2nd plotter gave me more opportunities to play with an algorithm. For every algorithm I wrote, I typically generate 100+ patterns and pick among them. I could maybe plot five of them with the new plotter instead of just making one or two. I was able to go through a lot more color schemes with the 2nd plotter as well. It is undoubtedly one of my best investments of this year.



You can see [my plotters in action here.](#)

The act of creating inspires me to make more. For example, I would often spot new ideas from old paintings or find areas to tweak. I think Zack Lieberman's daily sketch rule: "Prioritize iterate over novelty" is an excellent suggestion for generative artists.



I hammered MANY servo motors in the past 300+ days. But considering the painting stack that I built, I think it is an excellent trade.

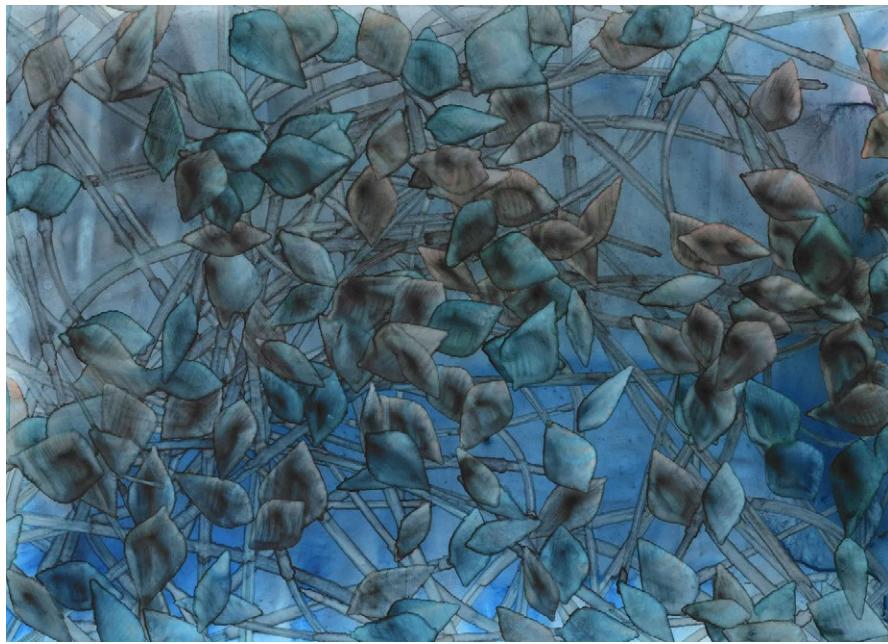
Occasionally I would doubt whether being this prolific is good. Am I making progress? Are they going anywhere? Are they worth the time/resource that I am investing in them? At the same time, I am aware that doubts like this are entirely baseless. Making little progress is ALWAYS better than staying in the same place. Making new paintings is ALWAYS better than making nothing. When this kind of doubt surfaces, I usually search for advice and inspiration from articles and books. Recently, I read this article by [Jason Bailey](#) titled ["How to Become A Successful Artist."](#) It discusses why making as much work as possible is the right thing for artists to do. Instead of only throwing out claims, this article provides data that supports this claim. Also, hearing other artists' stories from channels such as [the Jealous Curator Podcast](#) and [Colossal](#) helped me stay motivated.

Conclusion

Painting for 300 + days is changing me at many levels. Building a habit like this brings rewards that words cannot summarize. I am grateful that I had the opportunity to make this dream come true in 2020. I am even more thankful that it is only the beginning. I am excited to start the next 100 days challenge soon. At last, here are some of my paintings that made it to my top list in these 300+ days.

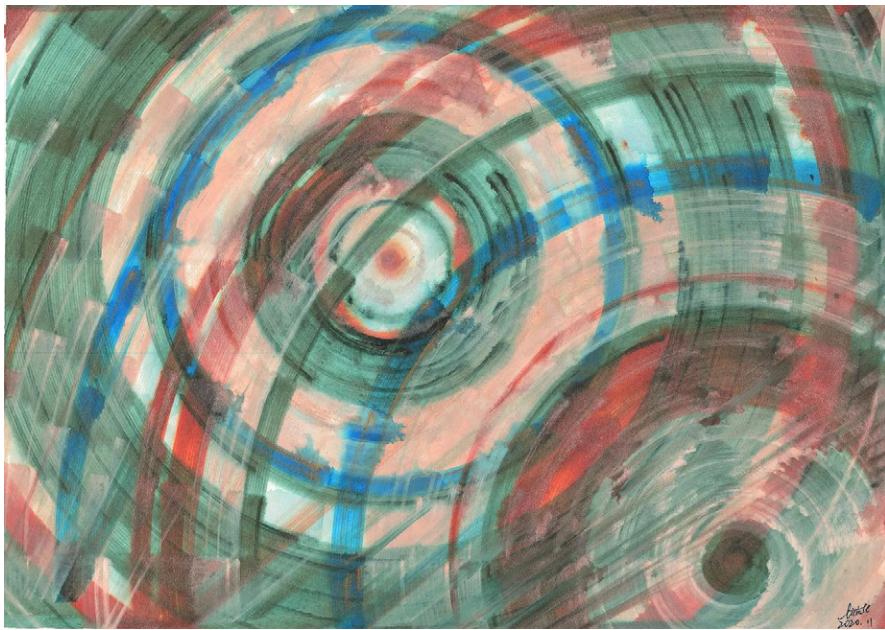
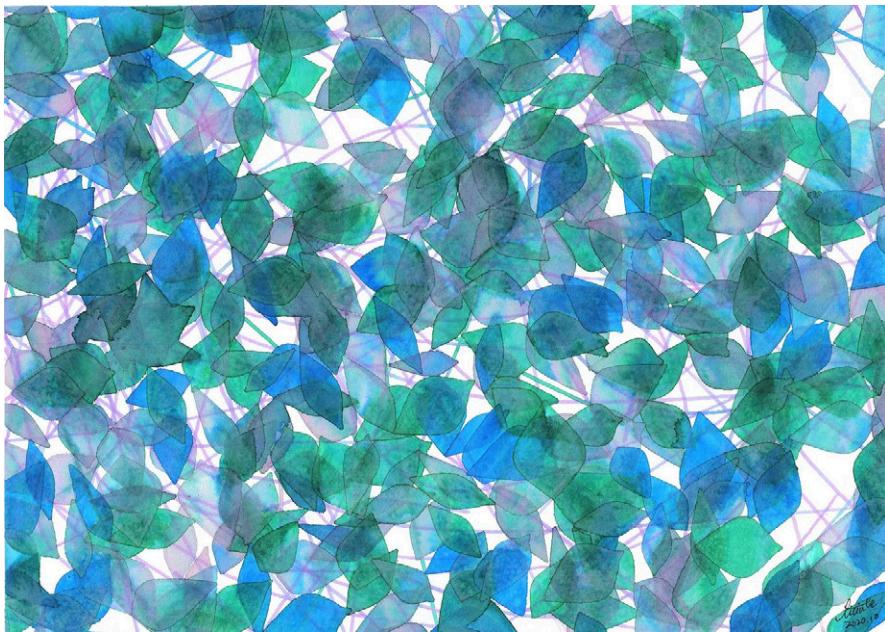


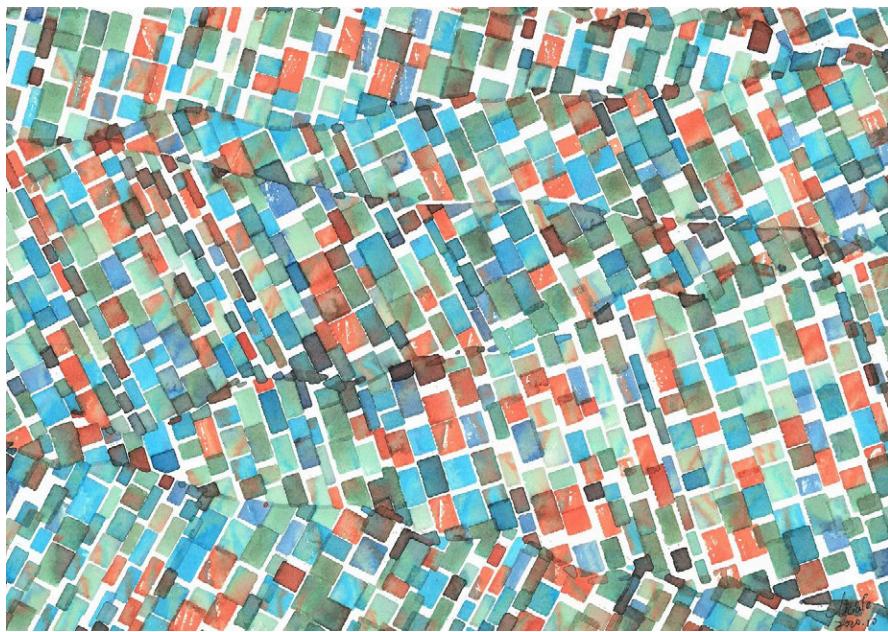
1. "SO HOW DOES IT OPERATE?", watercolor on textured paper.



2. "Being warm maybe — but I do.", watercolor on yupo paper.

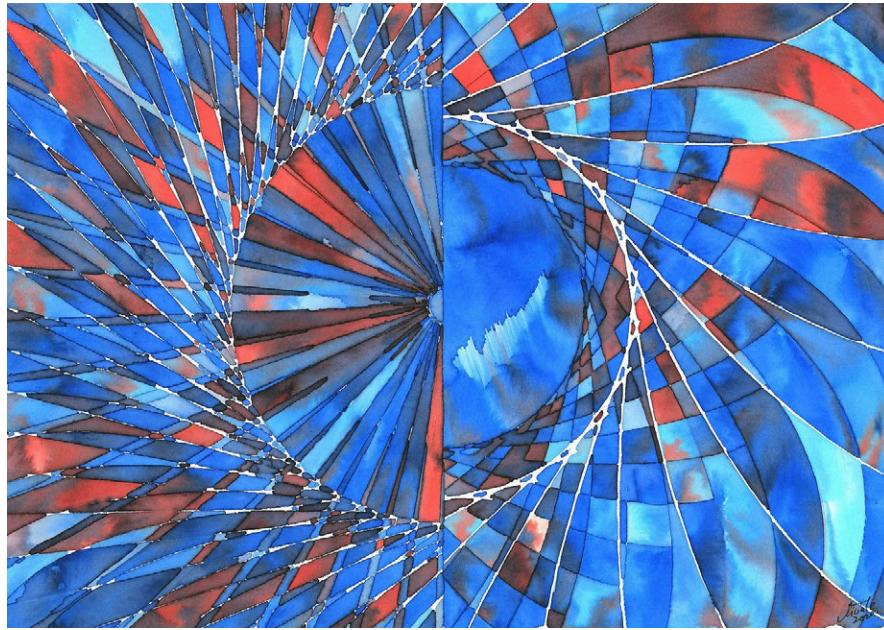
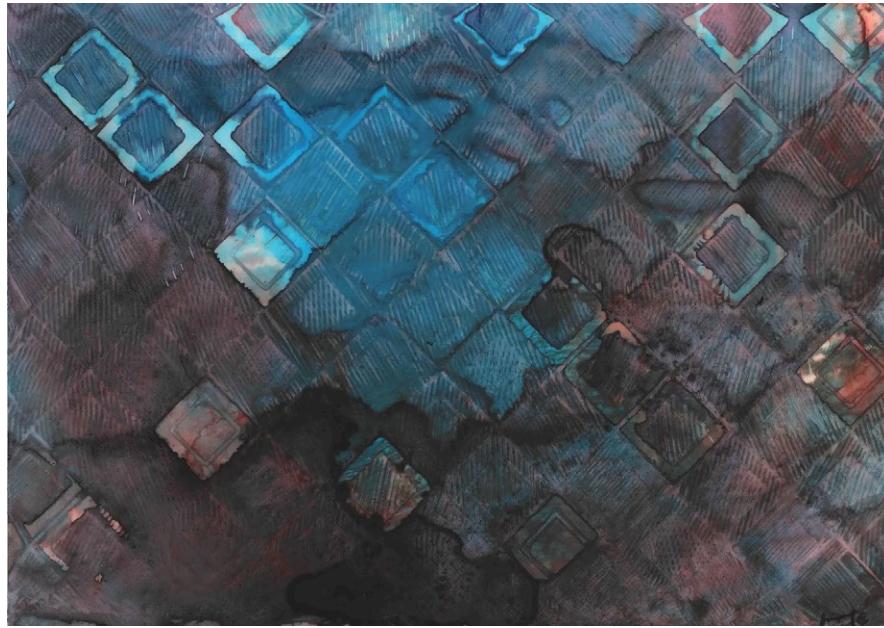
3. "And I know the difference.", watercolor on paper.4. "Both of you shut up!", watercolor on paper

5. "Let's step up the timetable.", watercolor on paper6. "While I'm at it you can rule the seas.", watercolor on paper



7. "Now that's not so easy," watercolor on paper

8. "Oh he had a reputation that was hard to have faith," watercolor on yupo paper

9. "And you would be part of justice being done.", watercolor on paper10. "He didn't even wait for the new leads.Three.Three?", watercolor on yupo paper.

Thanks for following along :) You can see more of my paintings on [my website](#), [Instagram](#), and [Twitter](#).

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