



# Bit & Stitch

A Human and AI Collaborative Knitting Project  
By: Sam McLeod

# Artist Statement

SAM: Hey AI, it's time to write the artist statement for *Bit & Stitch*, our collaborative knitting project. Any thoughts?

AI: Our knitting project explores the intersection between human creativity and artificial intelligence. By collaborating with an AI program, Sam aims to blur the boundaries between traditional handcrafts and modern technology. The resulting pieces challenge our assumptions about what it means to create art and invite us to reflect on the relationship between humans and machines.

SAM: Care to explain the process?

AI: In this project, Sam used DALL-E to generate knitting patterns that she then knit by hand using traditional techniques.

The qualities that make handmade knitted pieces special, such as their texture, color, and individual imperfections, are all a result of Sam's choices and techniques.

SAM: This project was time consuming, especially when compared to how long it took DALL-E to generate the patterns. I couldn't even finish some of the pieces within my timeframe!

AI: It's understandable that you might feel frustrated with the amount of time it took to complete our project. However, it's important to remember that while AI technology may be able to generate patterns quickly and efficiently, it cannot replicate the unique qualities and experiences that come from creating handmade art. The time and effort required is part of what makes it so special and valuable.

SAM: Well said.

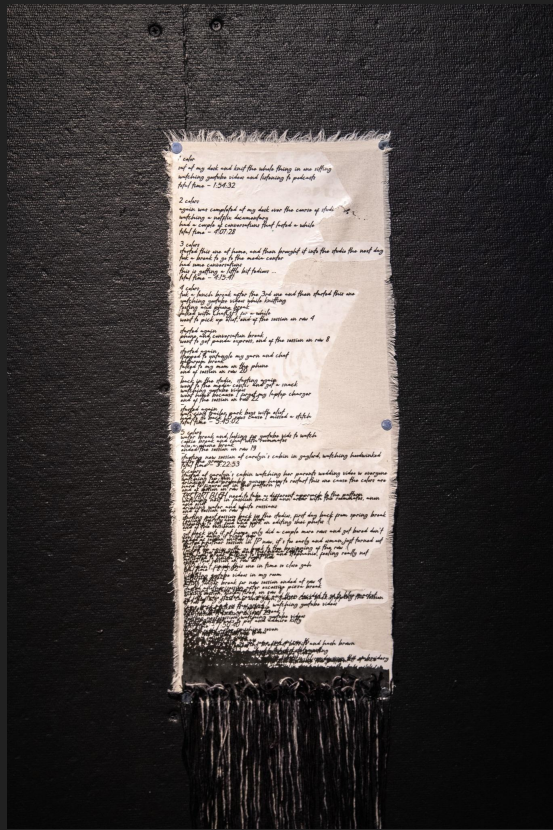
# Exhibition Documentation



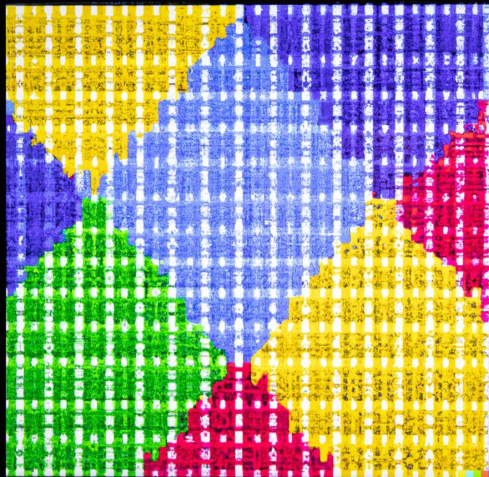
Full view of exhibition, which includes a tapestry of data on the left wall, a grid of my knitted pieces sandwiched between acrylic sheets on the center wall, and a monitor displaying the original AI generated knitting patterns and rules that I created for myself to follow during this project.

The central part of my exhibition is the grid of knits, which are placed in order, and are sandwiched between acrylic sheets. None of the excess yarn strands have been trimmed or woven into the knitted pieces in an attempt to highlight the handmade and unfinished quality of the pieces. This contrasts the AI generator and its functionality, while the bolts and acrylic bring back more of an industrial aesthetic that relates to the digital world. In the act of sandwiching the knits between the acrylic, I am returning some of the intangibility that comes along with a digital image to these very physical knitted pieces.





The tapestry which contains all of the timestamps and data that I kept for each of the knitted pieces surprised me with how much I liked it. I initially wanted to put this file through the embroidery machine, but had struggles with the machine breaking down as well as not allocating enough time, so I pivoted to image transfer sheets instead. As I was compiling all of the notes, data, and timestamps, I realized that it was quite repetitive and I felt that it was boring and that no one would want to read it. And then I realized that, well, maybe that's the point- no one ever really wants to hear about the repetitive and tedious processes that go into making handcrafted works- they just want them finished. So I decided to collapse the text on itself until it turned into this unreadable gradient, which I then felt was only appropriate to add embroidery floss that drops all the way down to the floor, in order to mimic the dripping strands of yarn in my knits. All of the labor, the work, the time and countless hours, they all simply unravel back into darkness.



1. YOU HAVE ONE WEEK TO COMPLETE EACH 30 BY 30 STITCH PATTERN
2. IF YOU DO NOT FINISH IT IN TIME, YOU MUST ABANDON IT
3. EACH SUBSEQUENT PATTERN MUST INCREASE BY ONE COLOR
4. YOU WILL KEEP DATA AND TIMESTAMPS DOCUMENTING HOW LONG IT TOOK TO COMPLETE EACH KNIT, AND WHAT YOU DID DURING SAID KNITTING SESSION
5. YOU ARE ALLOWED TO PICK THE COLORS USED



The monitor in my exhibition serves two purposes; to show the original AI generated patterns that I based my knits on, and to fill the viewer in on the rules that I created for myself to follow during this process. I also felt that it was nice to bring back at least one digital element to this project as it is largely fueled by an interest in the digital space.

Contextualization

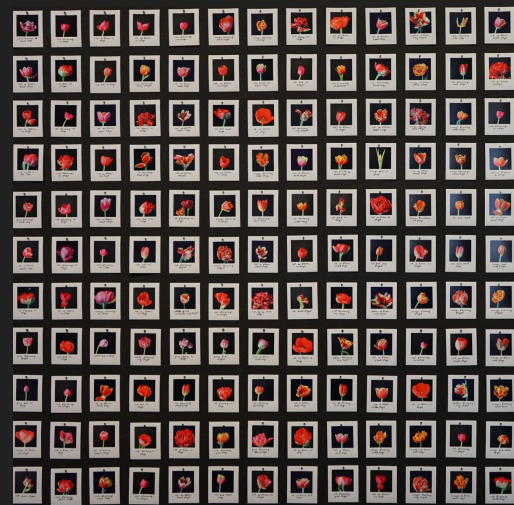


# Artist Precedents



Sougwen Chung "Gestures of becoming-With" (2021)

Something that strikes me most about this body of work is the deep connection that Chung strikes between human biology and AI generated art. I have always thought that this contrast is extremely interesting, and it most definitely propelled my wants to investigate the connection between humans and machines within art further.



Anna Ridler "Mosaic Virus" (2019)

My project actually ended up pulling from the themes of Ridler's work way more than I had originally anticipated. Anna Ridler trains an AI image generator with pictures of tulips that she takes, and I believe that the grid and repetition of these final elements is what really drew me to her work. I loved the idea of repetitive generations that build upon each other, and I feel as though that really comes into play in my final exhibition.

# Interdisciplinary Research

"Portrayals and Perceptions of AI and Why They Matter - Royal Society." The Royal Society. The Royal Society, November 2018.

<https://royalsociety.org/-/media/policy/projects/ai-narratives/AI-narratives-workshop-findings.pdf>

This study conducted by the Royal Society creates a focus around increasing the public's awareness of artificial intelligence, as well as creating more of an understanding as to why public perception of artificial intelligence matters. It is only inevitable that the prevalence and different use cases of artificial intelligence will increase over time, so it is imperative that the general public has a solid understanding of this technology, and what it can and can't do. Due to the fact that most of the general public's understanding of artificial intelligence stems from negative film and media representations, most people fear artificial intelligence, and think that it will take over the world. Of course, this is a scenario that is not even based in reality at this moment, as such complex AI's don't even exist. Due to this misconception, many automatically shut down artificial intelligence, even though it provides some wonderful benefits to how we function on a daily basis, and could even help create a more equitable society, and due to this, the Royal Society is dedicated to hosting workshops that increase the knowledge and comfortability of the general public with artificial intelligence.

I found this study and research to be extremely interesting and beneficial to my thought process surrounding AI and how to approach this project. I feel as though the Royal Society's view on why the perception of artificial intelligence matters is something that I wholly resonate with, and in some ways I want my project to also help others to feel more comfortable utilizing artificial intelligence, even though the project somewhat criticizes how AI computer efficiency can dishearten artists. Building an understanding between AI generation and the human hand is something that I want to achieve through the use of three-dimensional materials, but this study has led me more to think about if I should include some "behind the scenes" in my final project, whether it be screenshots of the conversations between me and the AI, or possibly providing some context as to how the process was completed and how the generator was built.

# Interdisciplinary Research (cont)

Shirado, Hirokazu, and Nicholas A Christakis. "Interdisciplinary Case Study: Understanding the Cooperation of ... - Cell." Cell Press: Open Access, December 2020. [https://www.cell.com/iscience/pdf/S2589-0042\(20\)30872-5.pdf](https://www.cell.com/iscience/pdf/S2589-0042(20)30872-5.pdf).

This study is based around questioning whether or not collaboration between humans and artificial intelligence is beneficial to us. One of their main questions that I found to be extremely interesting, "Can AI be used to help humans to help themselves?". They explore this question through case studies in which humans collaborate with an AI in an online world where there is a task to be completed. Throughout these tests the AI's 'personality' would be altered. It was found that when an AI was coded to mess up tasks, or say reassuring phrases like, "Even robots aren't perfect!". In these cases, the collaboration between humans actually increased when compared to a group working with an AI that completed tasks perfectly and didn't reassure the human members of the team. Now this definitely has some implications surrounding the human ego and psyche, but I do think it's extremely beneficial that this study highlights that indeed it is possible for an AI to help humans help themselves.

I found this study to be very interesting as well as validating my idea that an artificial intelligence generator may allow humans to think about themselves and collaborate in ways that could lead to many new possibilities, although there can be ways for the AI to be unhelpful and isolating towards the humans they are working with.. Along with this, I hope that there could be an impact on how the viewer perceives the internet, as well as allow people to question how they act on the internet. This study has helped reassure me that this is a possibility, especially due to the fact that this AI generator will have some intrinsic "imperfections" woven into it due to the nature of the data set. I hope that these "imperfections" will allow the viewer to feel that the AI generator has some vulnerabilities, and in turn this may allow the viewer themselves to feel more vulnerable and comfortable with receiving guidance or criticism from the AI generator.

Process

Edit the detailed description

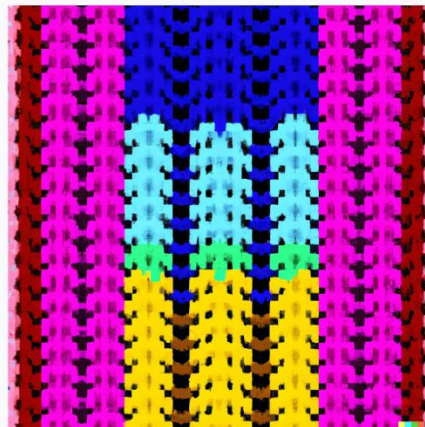
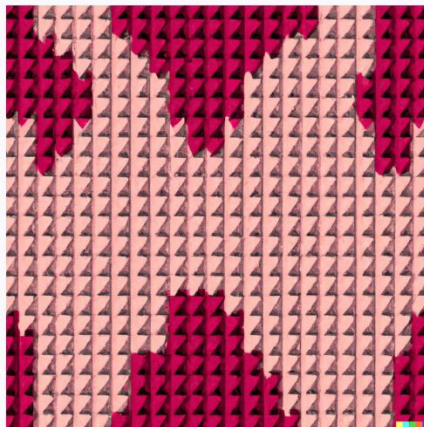
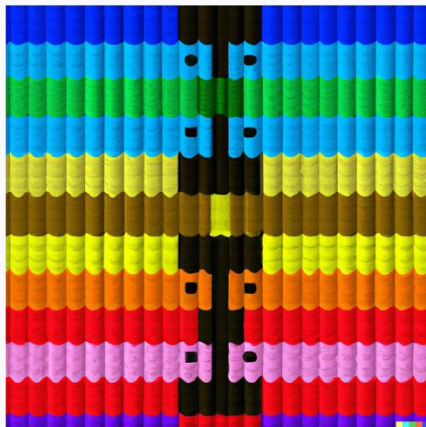
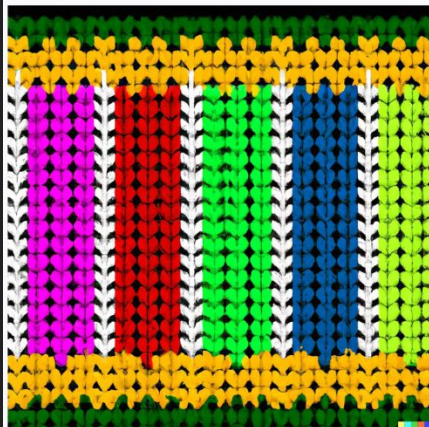
Surprise me

Upload



30 x 30 pixel knitting pattern using 11 colors

Generate



My process began with ChatGPT's DALLe, an AI image generator, and where I always asked it to generate me "a 30 by 30 pixel knitting pattern using \_\_\_\_\_ amount of colors". I then would continue generating until I found a pattern that I liked and was interested in knitting.





Then it was time to begin knitting! I used a method of color and pattern work knitting which is called Intarsia. Intarsia is a style of knitting in which each block of color within the pattern uses its own bobbin of yarn, and when switching between colors while knitting, one must twist the new color around the old one in order to avoid a hole from forming. This was a new style of knitting for me, but I would say that I took to it pretty quickly after watching some youtube tutorials. However, when the colors increased, the confusion definitely increased as the bobbins of thread began to knot around each other.

## 5 color-

### Water break and looking for yt vids to watch

Cookie break and chat with roommates

Also a phone break

ended at on row 19 - 2:14:44

Starting new session at Carolyn's cabin in Gaylord, watching Hoodwinked with the group

Finished - 54:09:59 for the second session

3:22:53 - Total time taken

## 6 color

Started at carolyn's watching her parents wedding video w everyone

Watching Top Gun

Drinking lol probably gunna have to restart this one cause the colors are hard to figure out in the pattern

Regardless first session took : 1:07:04 and ended at row 6

RESTART BLEH different approach to the pattern

Watching Next in Fashion back in Ann Arbor with the roommates and anon and eliot

Drinking water and White Russians

Finished session for the night on row 9 : 2:11:36.55

Starting next session back in the studios, first day back from spring break

Feeling thirsty and tired bleh

Stopping to get food and work on editing shej photos :( 9:40:51

Got back into it at home, only did a couple more rows and got bored don't feel like doing it rn but I definitely should finished on row 13 :P like 30:42.48

minutes

Started another session in IP now, it's too early and Osman just turned out the lights

Fucled up agin gotta go back to the beginning of the row on a row where I'm changing colors :(

Went to the bathroom and the media center

Bathroom break, talking to gabby and Stephanie, feeling really not motivated to finish this rn

Finished with this session on row 21 at 3:21:20.87

RIP didn't finish this one in time so close gah

## 7 color

Watching YouTube videos in my room

bathroom break

games break

taking longer break for now session ended at row 4 - 1:11:22

started another session after excessive pizza break

watching yt vids

ending session kinda tired on row 8 - 1:04:14

Got into studio started real quick and then decided to go to blue market and buy my grad cap and gown, gunna come back stopping at row 9 rn - 16:14.72

Came back and on the grind ! watching YouTube videos

Stopped and talked to Stephanie

Talked to gabby

Extended bathroom and chat break !

long session ! ending on row 23 - 4:12:36

Starting next session, watching yt vids

Drinking coffee

Taking some breaks to pet/admire kitty

Finished!! @ 1:06:14

## 8 color

Started next session

Kept drinking coffee

Again watching yt videos

Finished session on row 8 - 1:26:46

Starting session in class

Watching yt videos

Talked to deppa and osman

Talked to Stephanie

Ending session to go get some food on row 16 - 1:09:57

starting again after eating breakfast burrito and hash brown

watching yt vids

bathroom break

talking with gabby

Finished !! @ 2:18:50

## 9 color

Meet with Osman about my artist statement

Talking with facilities about installation and painting

Taking break from session on row 5 - 1:05:09

Starting session again., watching YouTube videos

Talking to diff studio mates

Called financial services

Called my mom

Ended session mid row 19 - 1:50:56

Continued again, watching yt videos

Finished !! @ 1:17:44

## 10 color

Let Eliot in and talked a bit

Talked to kitt about knittings and then got a lil rundown on the embroidery machine

Grinding, watching YouTube videos

Finished session on row 15 - 2:29:22

Started session on couch ! Watching everything everywhere all at once

Bathroom break and chatting!!

Grinded through the whole movie and finished the pattern!

Finished @ 2:56:04

## 11 color

Sitting watching YouTube videos

Took a phone break

Gabby came and said hi

Finished this in one sitting!

Total time - 3:08:19

## 12 colors

In bed, watching YouTube videos

Called my mom

My mom called me

Called Eliot

Finishing the session for now to go take a shower on row 8 - 2:02:02

In the studio, watching YouTube videos

Took a phone break

Bathroom break

Phone break

Ending the session on row 18 - 2:29:11

Starting new session on the couch watching fleabag with eliot, gabby, and

Caine

Stopped to help eliot cut his hair and chatted

Took a break to eat a veggie burger that eliot made me

Continued watching fleabag

Finished! This session took -2:57:48

## 13 colors

In the studio, watching YouTube videos and drinking coffee and chocolate milk

Phone break

Bathroom break

Phone break

Finished in one sitting ! Total time - 3:52:27

## 4:31:13

7:29:01

## 14 colors

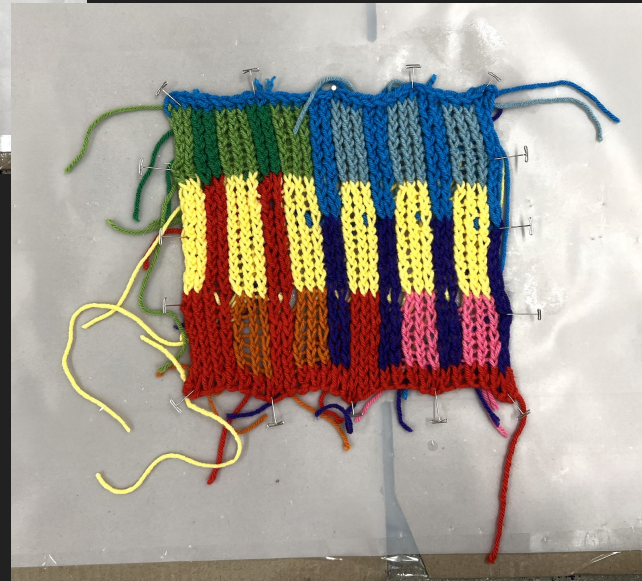
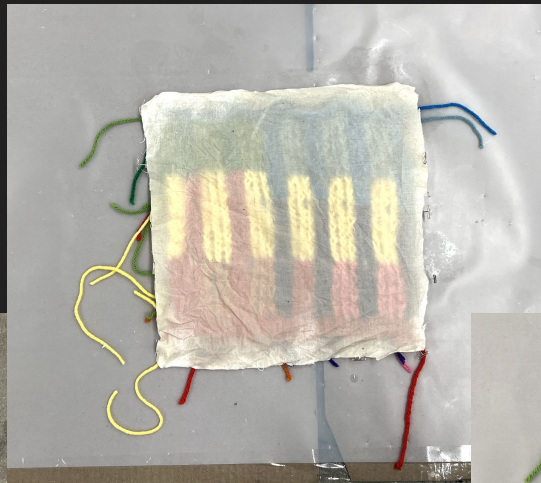
In the dana building with eliot

Drinking chocolate milk and watching YouTube videos

Finished with session on row 7, pretty tired @ 1:24:52

During the process of knitting, I kept a stopwatch running that I would leave on during the entire "knitting session". If there were any breaks or distractions during the session, I kept note of them so that they could be accounted for when considering the total time it took for me to complete each piece. Along with that, the act of keeping this data acknowledged my human needs while endeavoring on a machine inspired project.





When all of my knitted pieces were complete, I used a technique called "blocking", which flattens and stretches the pieces to a uniform dimension. This required me to pin the knits to the dimension that I wanted, and then steaming them and allowing them to fully dry while pinned. When I was done I was left with uniform knitted pieces ready to be sandwiched in their acrylics!

# Final Thoughts

The entire process of this class and project has really underscored to me that sometimes ideas take lots of thinking and brainstorming before a final and representative idea can come into fruition. I felt that I struggled a lot with this project in the first semester, but after countless shifts and lots of trying and failing, I feel that I really found the idea that best communicated what I initially wanted to do with this project; collaborate with an AI. This project became sort of an experiment for myself, testing myself and seeing how far I could push myself, and this is something that I am now extremely interested in continuing in the future. I could most definitely see myself continuing this project, seeing just how many colors I could feasibly knit into a 30 x 30 square. However, even if it wasn't specifically for continuing this project, I am still interested in exploring the idea of experimentation and testing how far human labor can go in a further and even more developed context.

Thank you!