

# Exploring Influences on Native American Quilting Aesthetics

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# Hi, Team



Sneha Arvind

**Incoming:**  
UX Researcher, Industrial Designer

**Learned:**  
Data Analysis, Concept of  
Programming



Deepika Gopalakrishnan

**Incoming:**  
Product Designer, Co-Founder of  
dVerse Innovation Lab

**Learned:**  
Interaction Design, Data Analysis



Cathy Park

**Incoming:**  
UI/UX Designer, UX Researcher,  
Data Analyst

**Learned:**  
Machine Learning, Data Analysis

# Project Motivation 1



Quilts were first introduced to Native American or Indian communities by European settlers seeking to "civilize" them through European home-making skills.

## Project Motivation 2



Ethnographers failed to recognize that the community was changing, and while the quilt on its own may not be unique, it gives a glimpse into the community's belief system and worldview.

# Research Question 1



How have quilting aesthetics **evolved** through time across Native American tribes?



## Research Question 2



Are there any **visual relationships** in quilting aesthetics, including but not limited to color and motifs across various Native American tribes and cultures beyond?







## Research Question 3

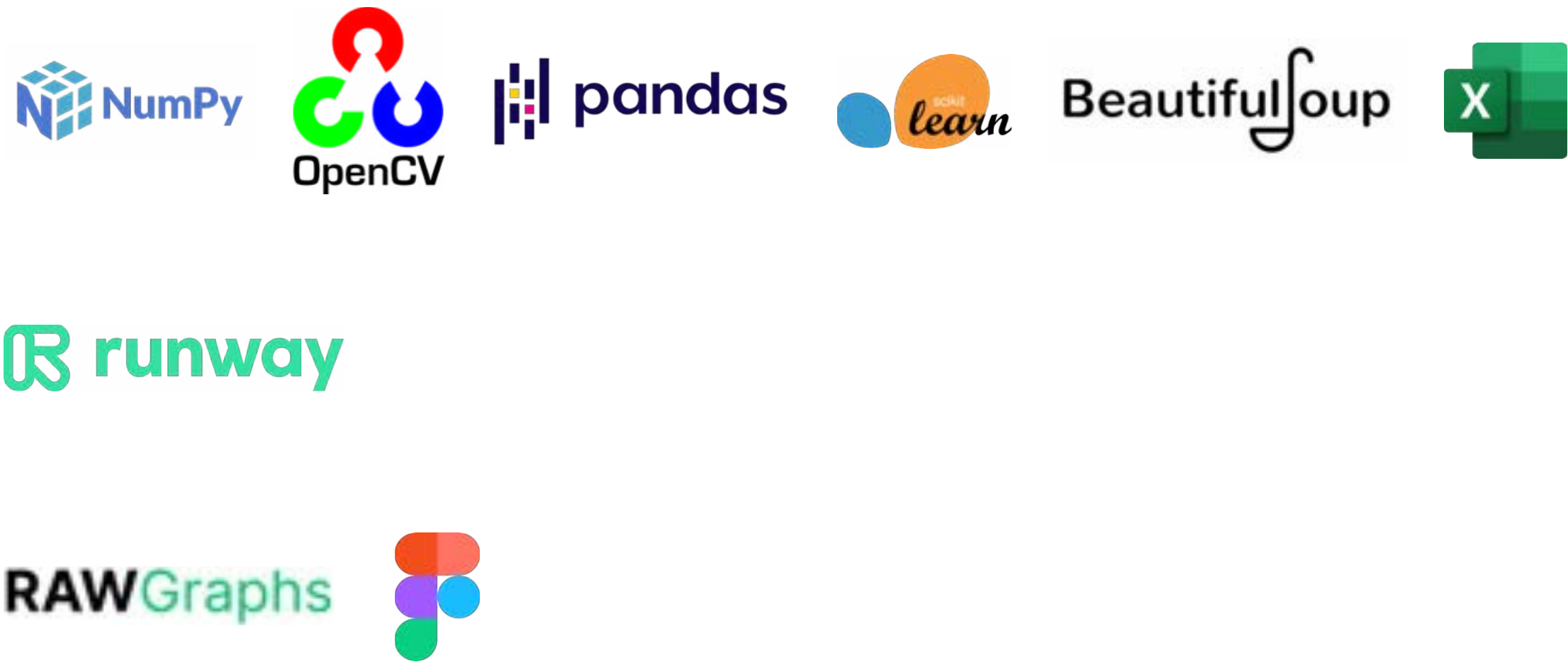


Using generative technology, how might we explore **alternate quilting aesthetics** or new, hypothetical forms of connection between tribes?



# Design Research Process

-  Define Research Purposes
-  Background Research
-  Interview Curators/Researchers
-  Collect Data
-  Create Generative Images
-  Design Data Visualization



# Audience



## Stakeholder 1

Audience who is curious to learn about Native American quilting culture

***Value***

Getting an overview of the quilting culture; Visual references; Getting a tactile and visual feel for the art form; Get an intimate look into the art form.



## Stakeholder 2

Educators/Curators

***Value***

Accurate and honest representation of data that is sensitive to the culture and art form. Value self-initiated exploration and discovery.



## Stakeholder 3

Native Americans

***Value***

Accurate and honest inferences and inferences that are backed by data that is sensitive to the culture and art form.



# Product Values



- Participatory Design Process
- Honest
- Exploratory - discovery-led
- Intimate, Emotive and Personal
- Transparent (with sources of data mentioned)

# Research Methods

## Books



## Interviews

### Cynthia Mackey

*Associate Registrar for Rights and Reproductions  
Peabody Museum of Archaeology and Ethnology*

- Data Sources

### Julie Fiveash

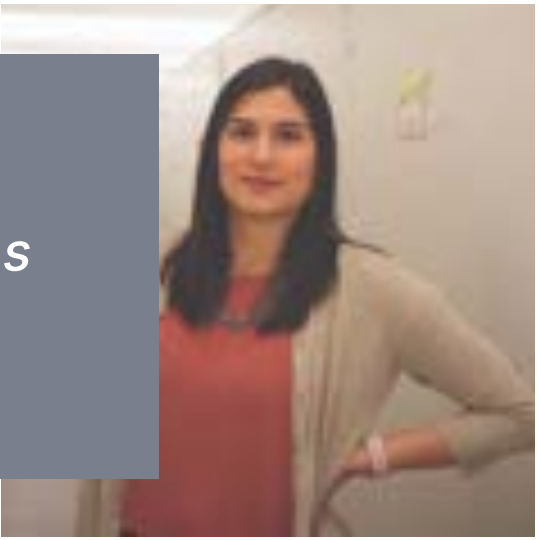
*Librarian for American Indigenous Studies  
Harvard Faculty of Arts and Sciences  
Tozzer Library*



- Sources of quilting materials
  - cloths
  - donations
  - Bluebird Flour Sack
- Inferences of quilt patterns
  - landscape
  - history
  - location
  - Data Sources

### Stephanie Mach

*Curator of North American Collections  
Peabody Museum of Archaeology and Ethnology*



- Color symbolism
- Relationships between tribes changed over time
- Indigenous influences from other communities/countries
- Methods and practices of quilting passed down as cultural heritage



# Data Acquisition

Collect Data



Example of Quilt Images

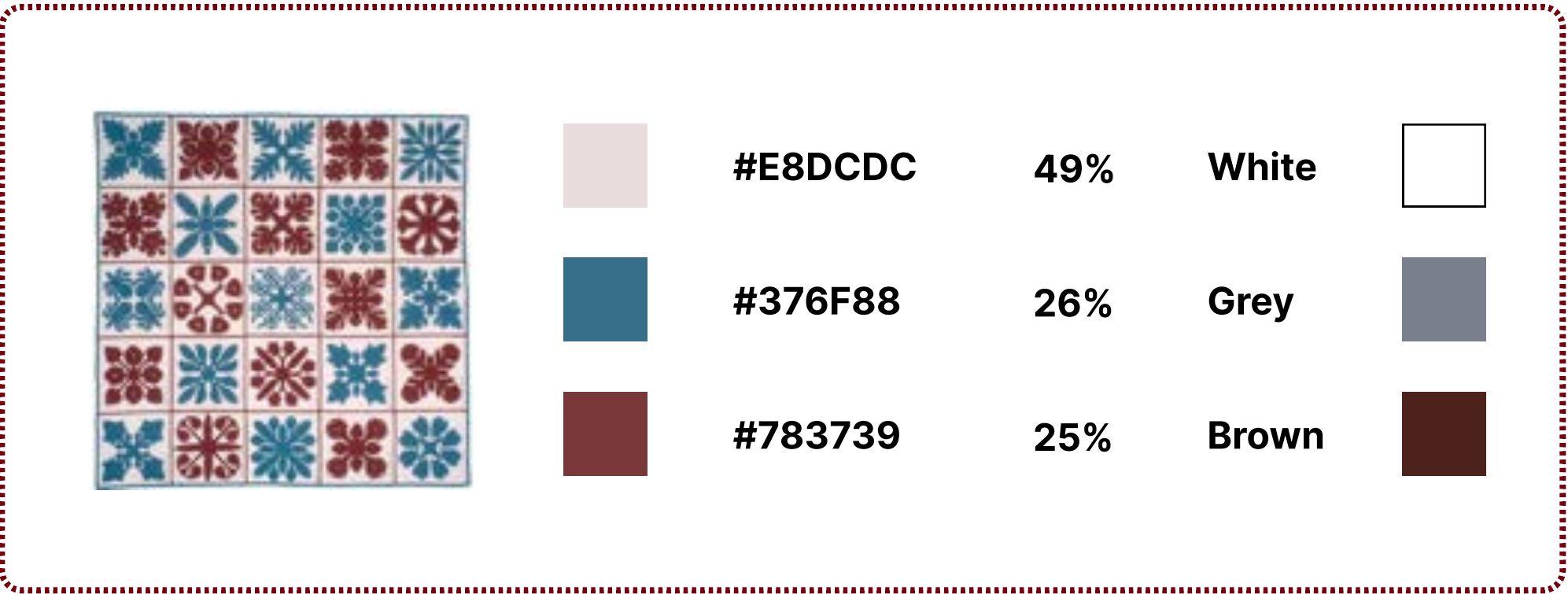
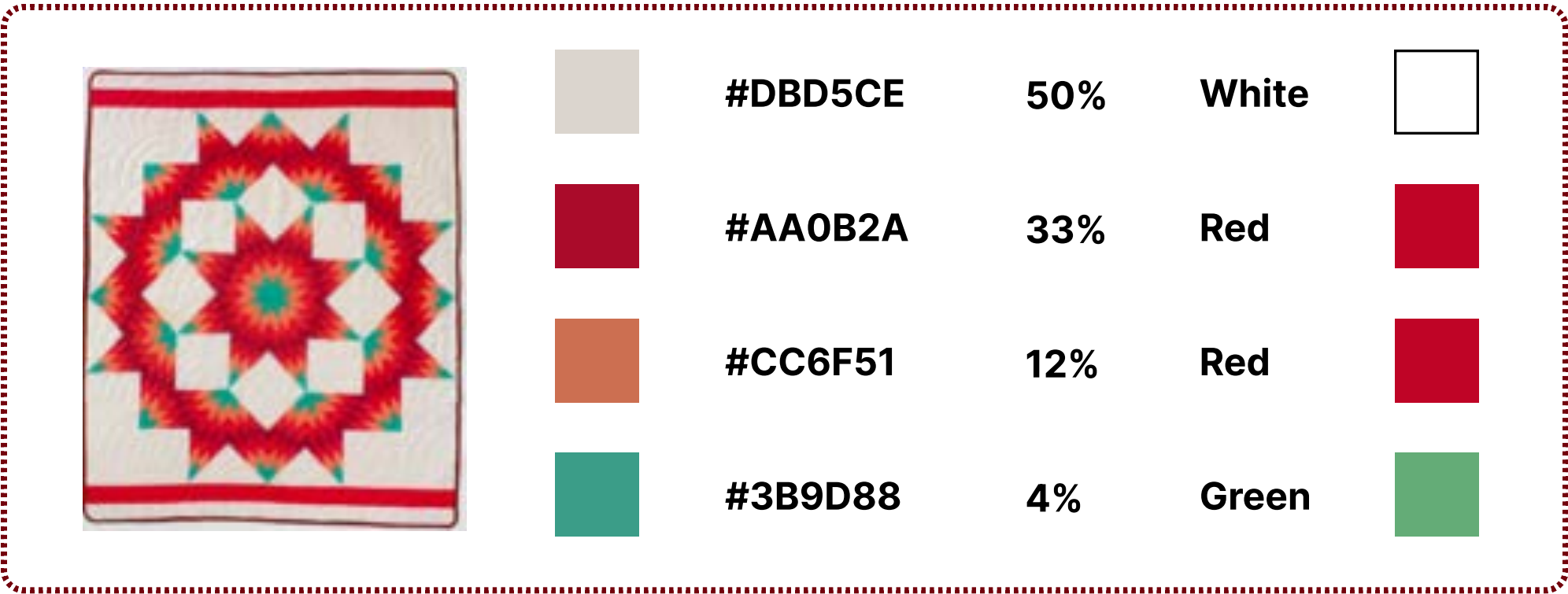


Extract and  
Categorize Colors

OpenCV  
MeanShift

Color Buckets

- 1. Red
- 2. Yellow
- 3. Orange
- 4. Light Blue
- 5. Navy Blue
- 6. Pink
- 7. Violet
- 8. Maroon
- 9. Green
- 10. Peach
- 11. Black
- 12. White
- 13. Brown
- 14. Grey





# Generative Models

*Research Question*

What will Native American quilting aesthetics look like in 100 years, given that we have data on the past?

*Tools*

StyleGAN  
RunwayML

## Attempt 1: Overall

- 1

Rotate images in 90, 180, 270 degrees

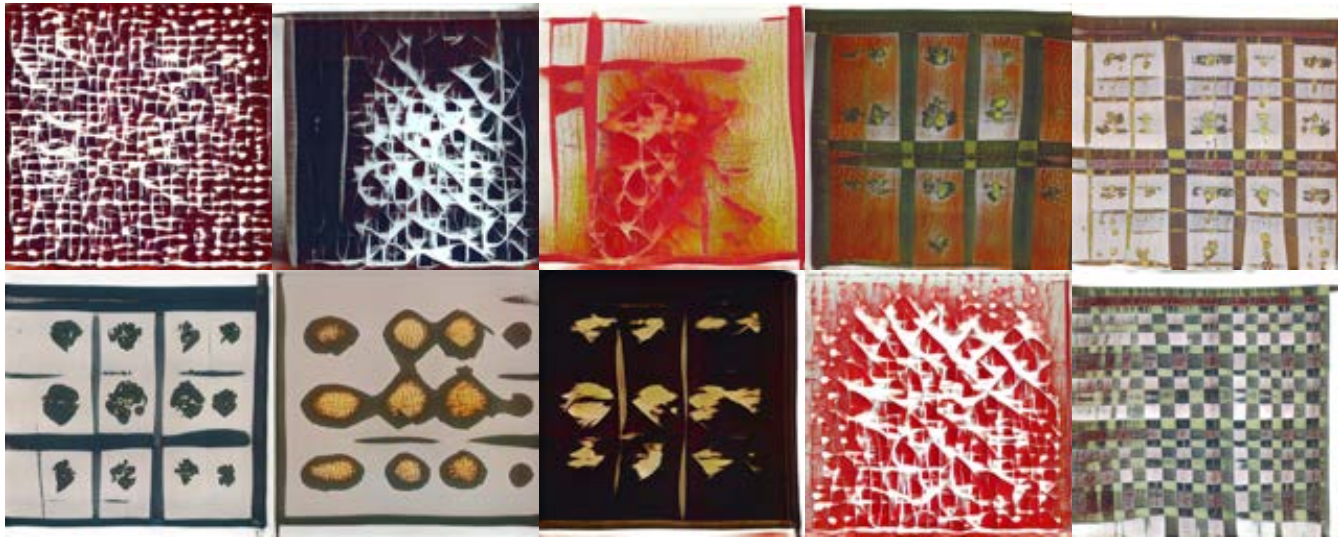
368 images
- 2

Feed the images into RunwayML

1,104 images
- 3

Train StyleGAN model on RunwayML
- 4

Create 500 generative images



## Attempt 2: Hopi and Sioux Tribes

*Filter images from Hopi and Sioux tribes*

- 1

Flip 170 images and rotate both flipped and original images by 1, 2, 90 degrees

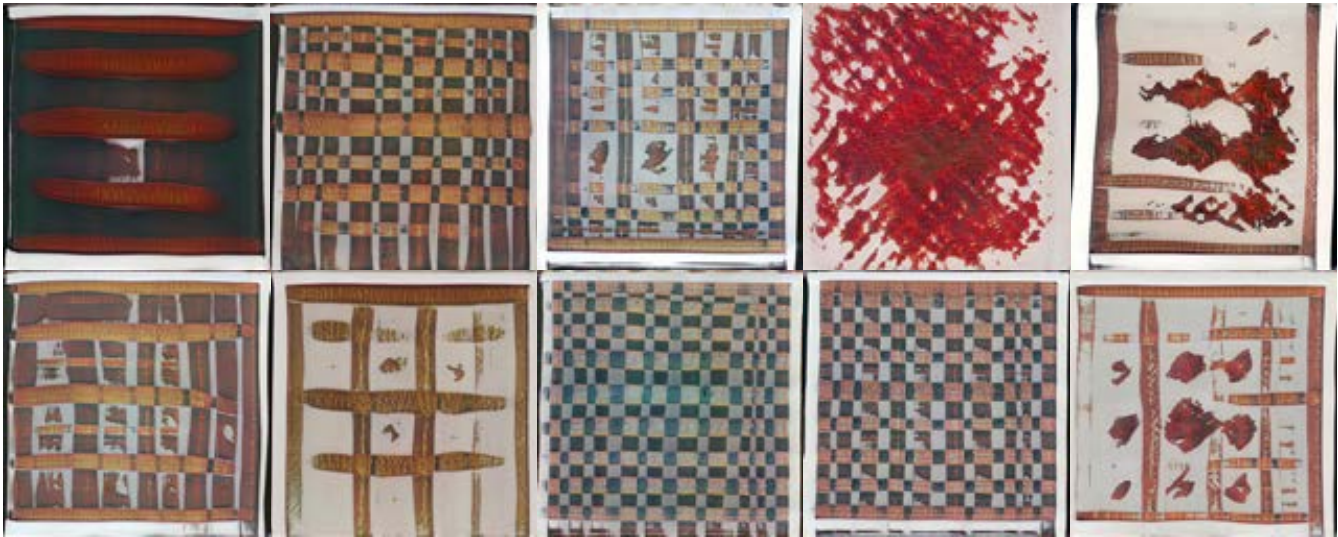
170 images
- 2

Feed the images into RunwayML

1,020 images
- 3

Train StyleGAN model on RunwayML
- 4

Create 500 generative images





# Moving Forward



- Implementing exploration across different motifs
- Provide a more intimate look at quilts - creating a data portrait for each quilt
- Implementing the motif exploration in 3D





