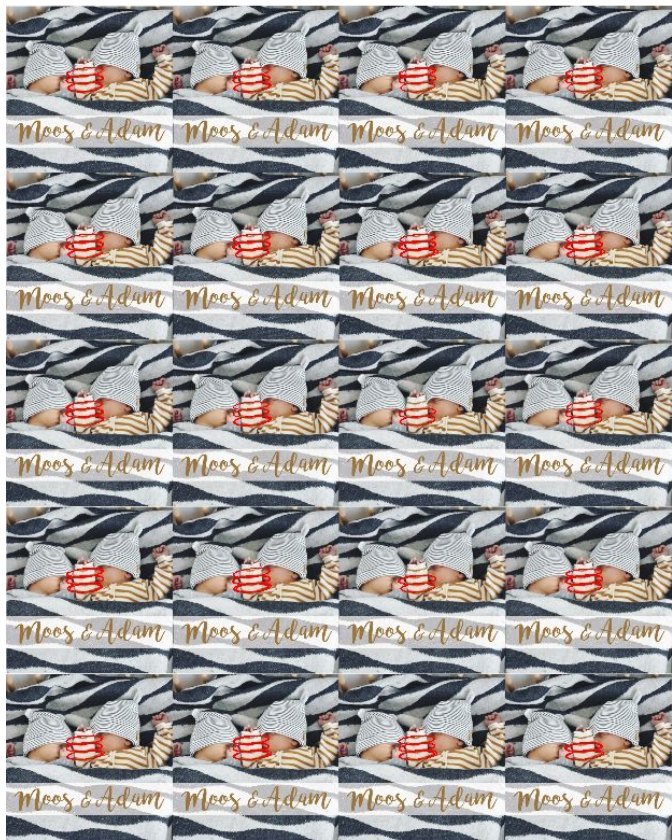


Lattice Extraction

Pipeline

Extract features from the input image and cluster them based on similarity



Feature
Cluster 1



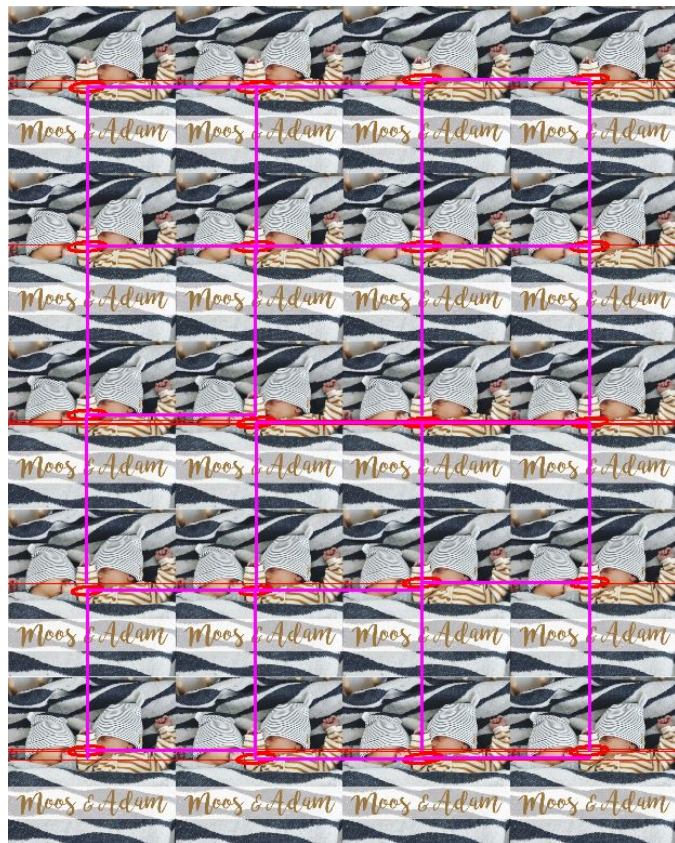
Feature
Cluster 2

...

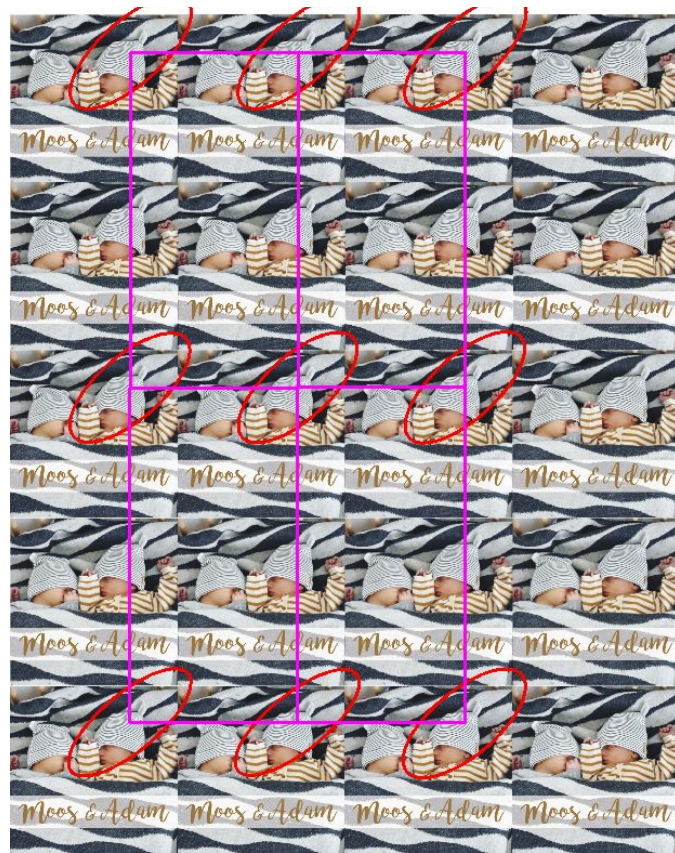
For each feature cluster:

1. Generate candidate grid transformations
2. For every candidate grid transformation, identify how many of the features in the cluster support this transformation
3. Return the grid that has the maximum support (if this maximum support is above a predefined threshold)

Per cluster grids:



Grid 1



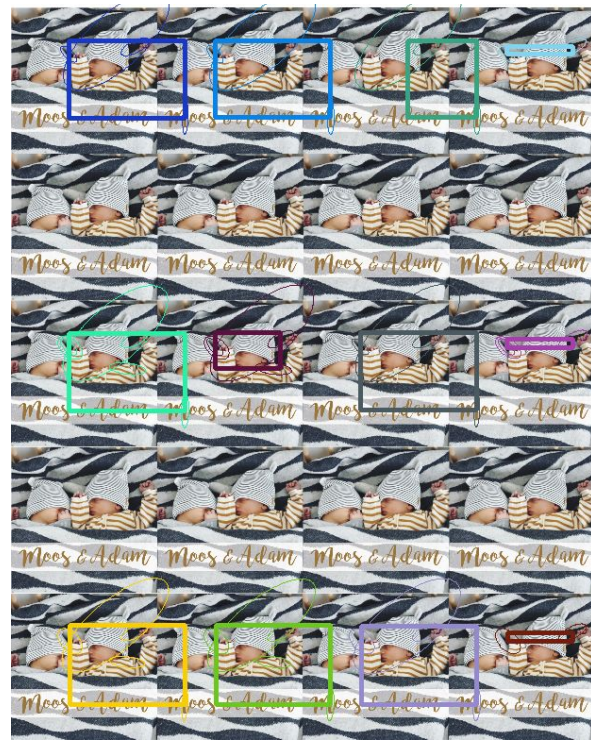
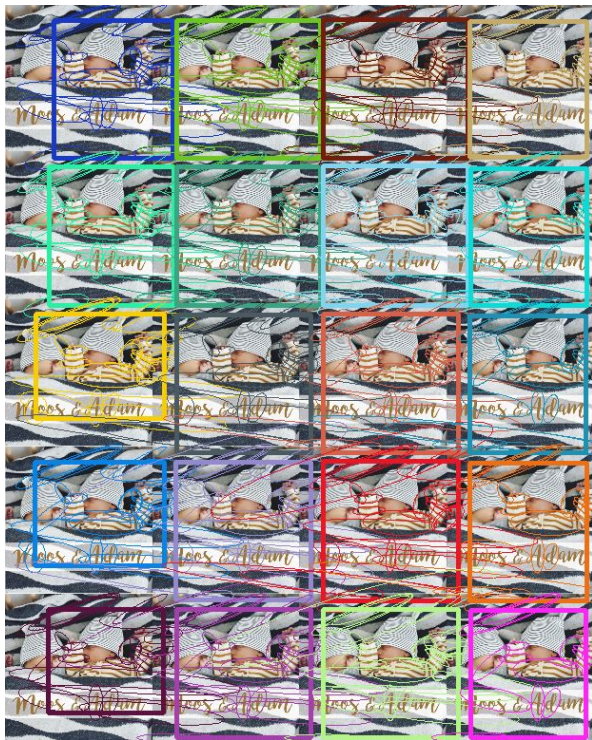
Grid 2

Group the grids with similar transformations

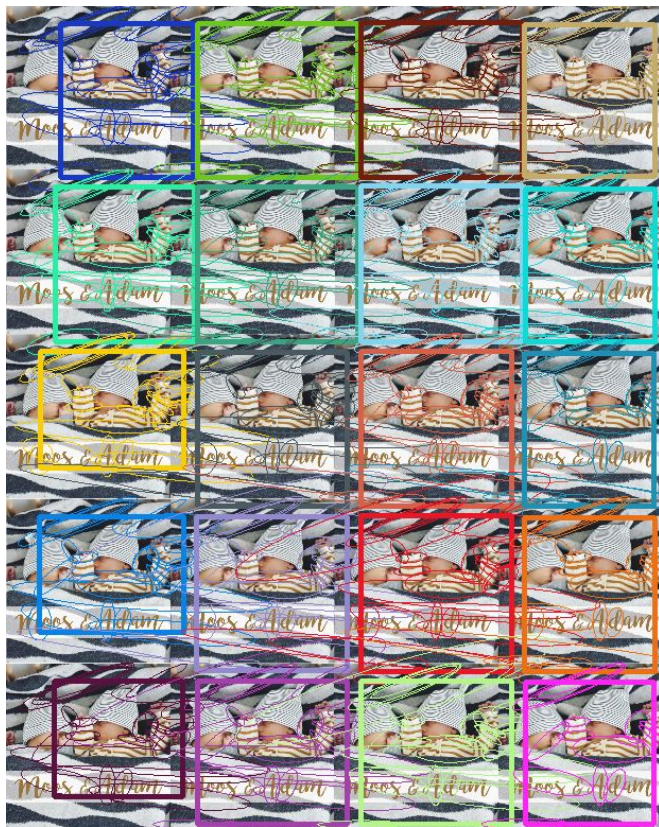
1. Group the different grids into bins based on the similarity of their transformation vectors.
2. Two grids are in the same bin if they have the same (up to a threshold) transformation vectors.

In each grid group, cluster the features:

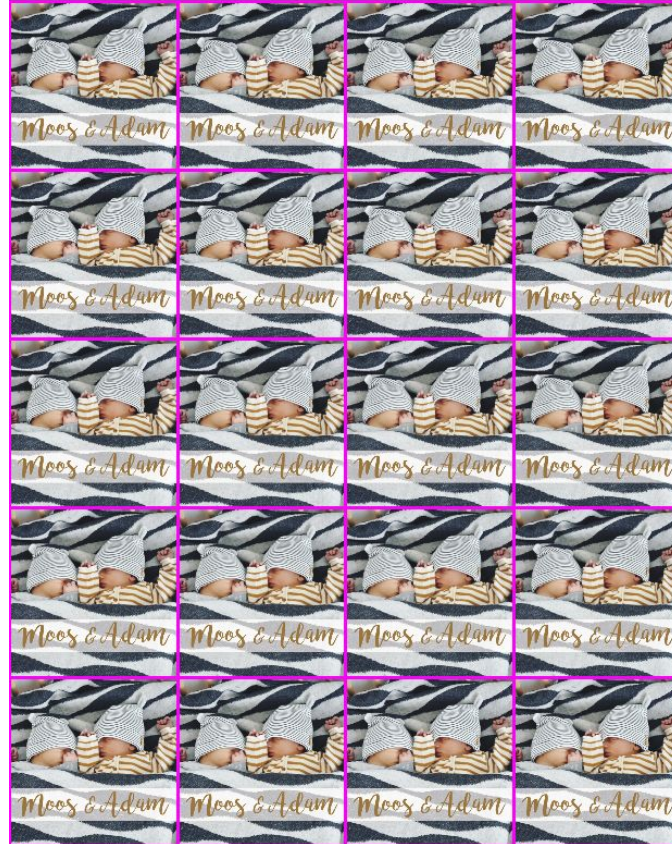
1. Features in the same group belong to the same grid element.



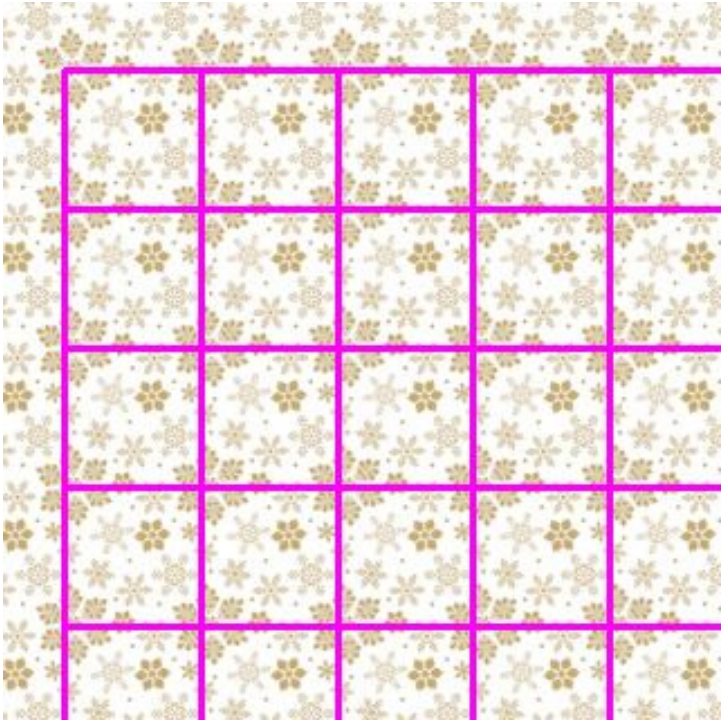
The group of grids with the max number of features is our final grid:



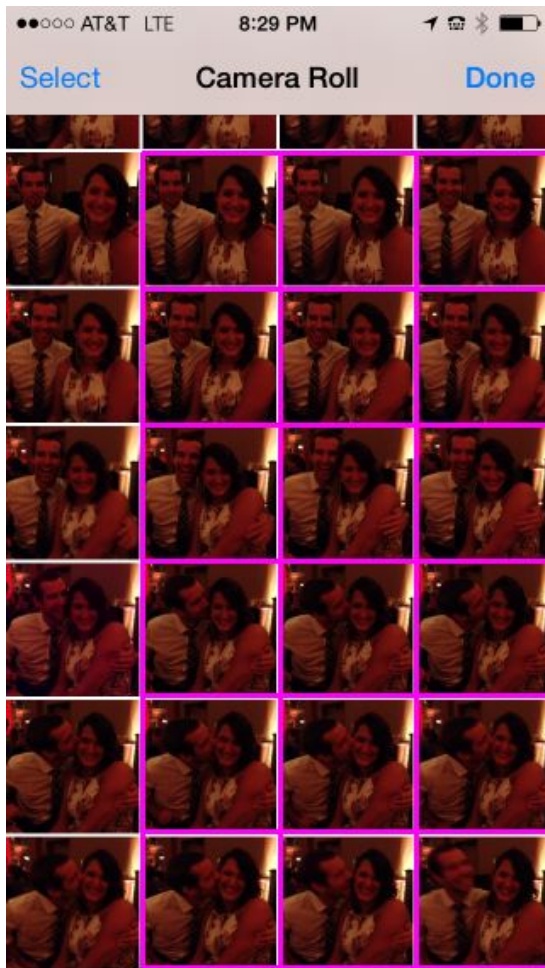
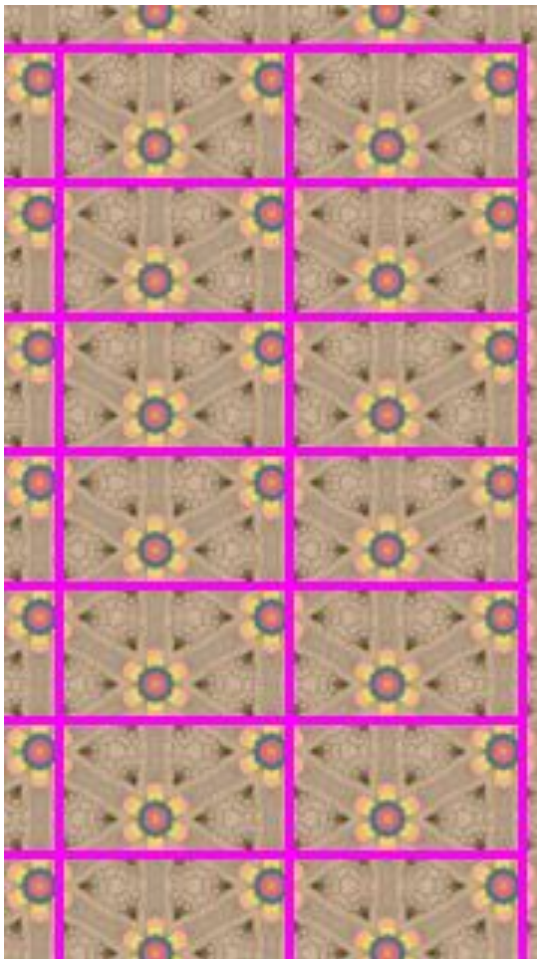
Position the grid separation to align with high gradient regions:



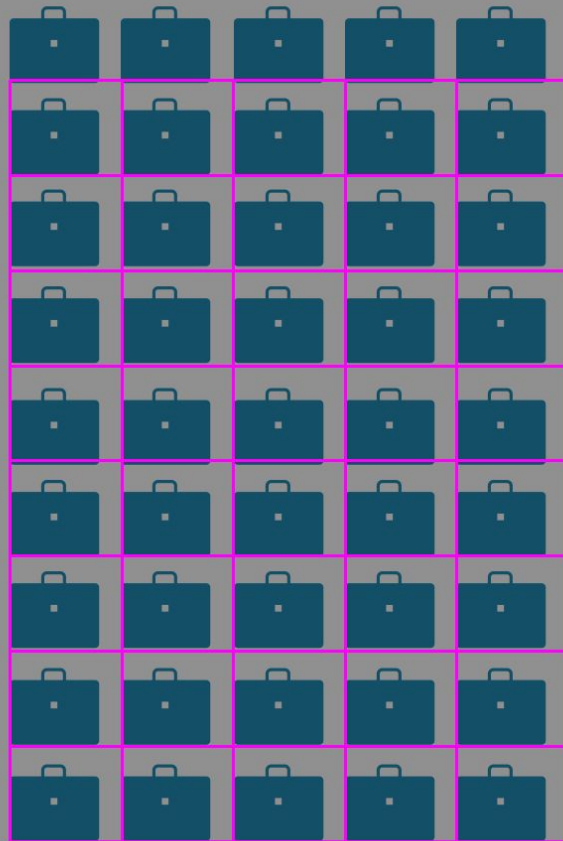
Examples:



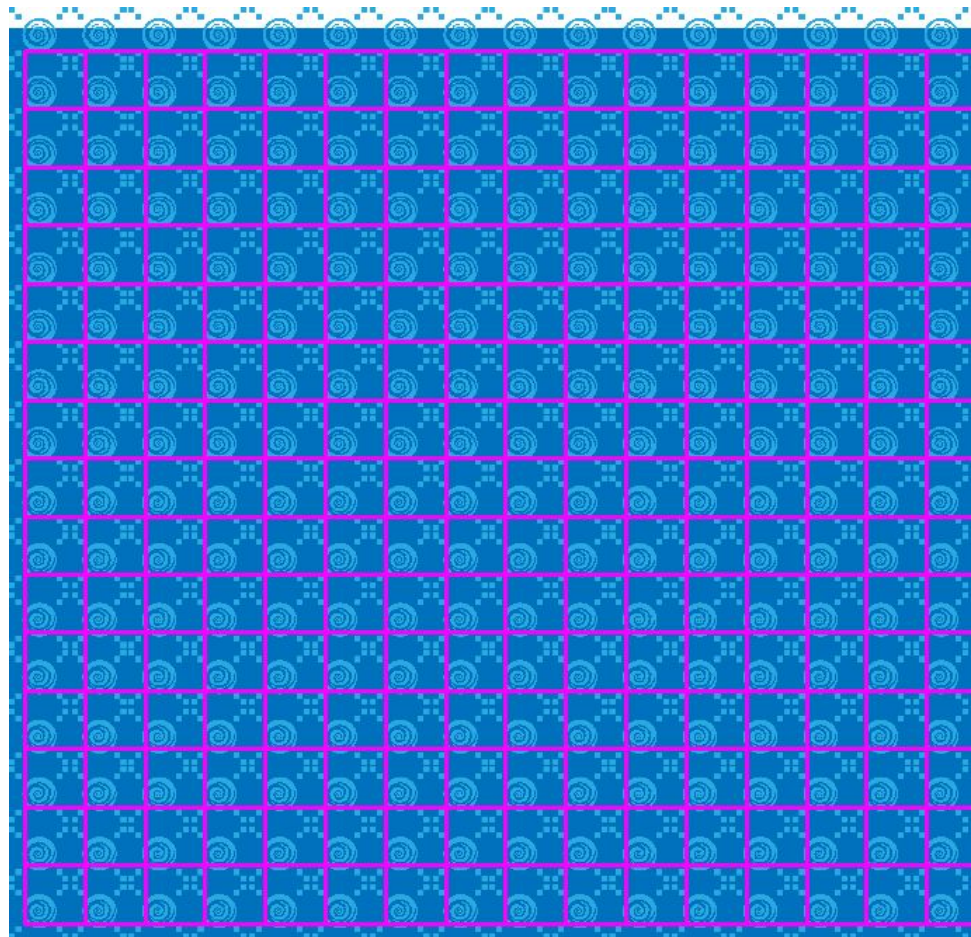
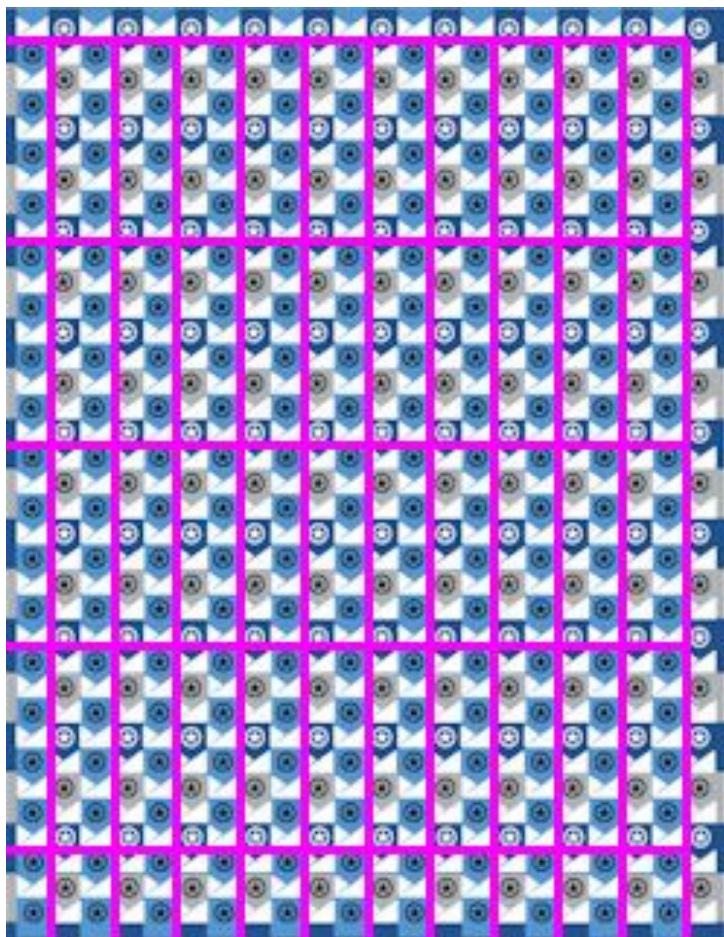
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

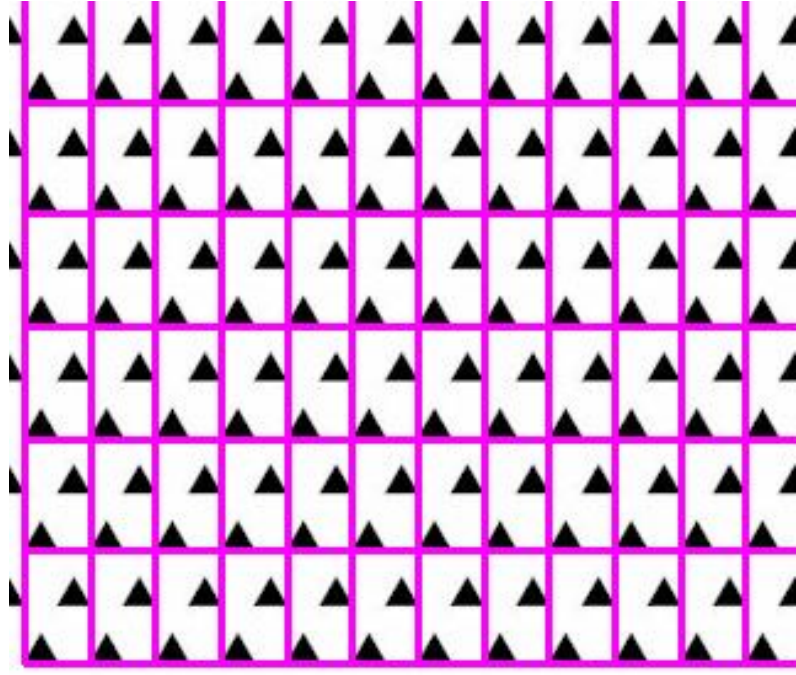


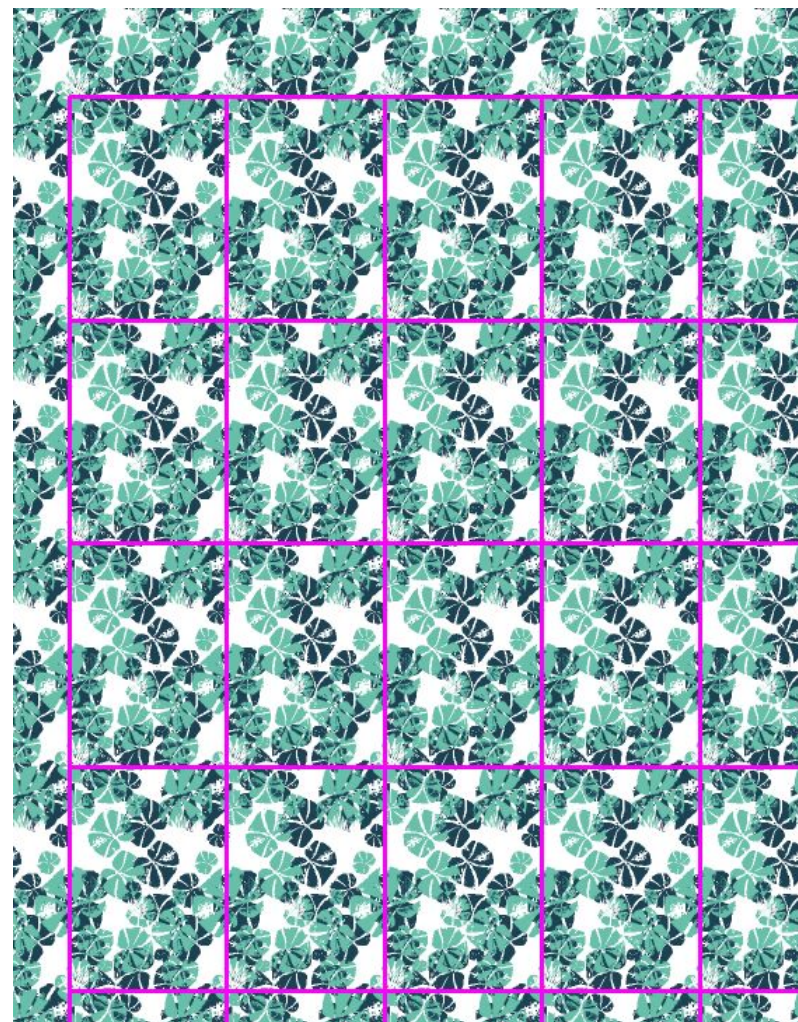
45 youth have secured steady employment.

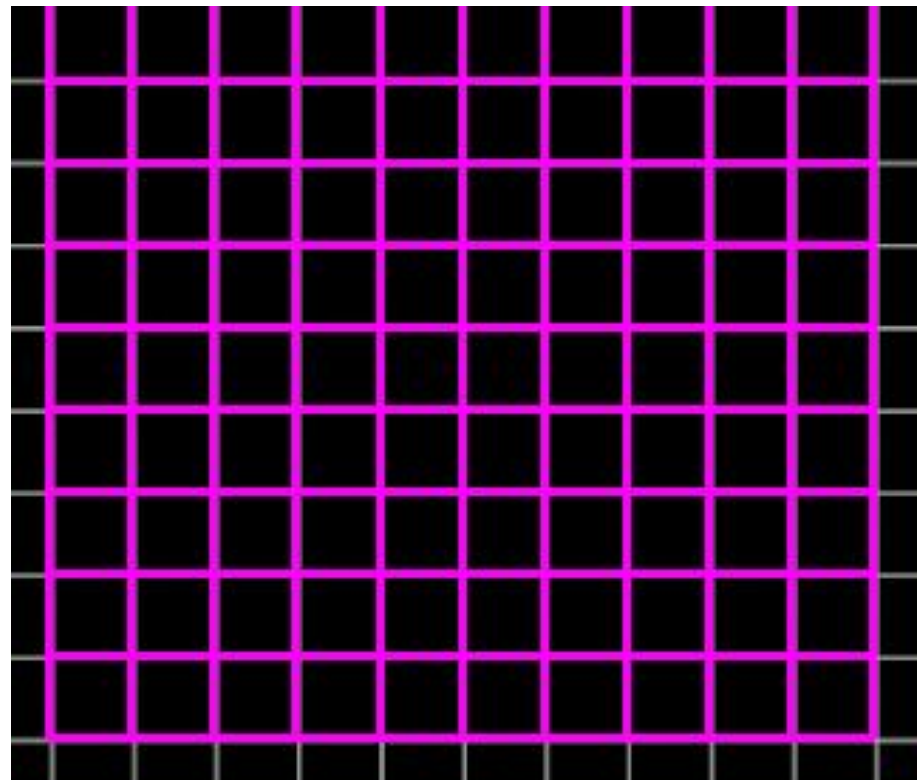


A 4x4 grid of 16 identical panels. Each panel features a stylized, symmetrical face with red and white patterns, framed by a thick purple border. The face has a central red area with white details, and the overall design is highly symmetrical and decorative.









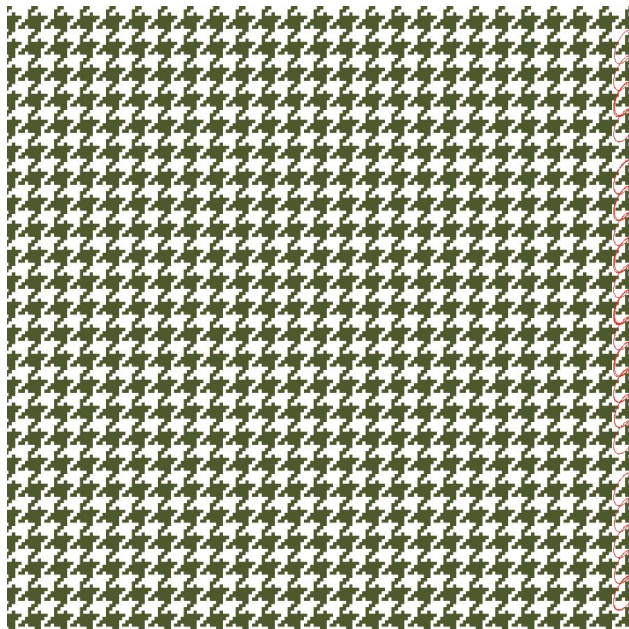
Improvements:

- Handling non-horizontal/vertical grid transformations
- Handling non-fronta parallel images

- The implementation is in C++
- Some parts of the pipeline can be parallelized

Failure modes

- If not enough features detected:
 - We may miss a grid or detect a grid with a bigger transformation vectors



Features are detected only at the boundary

Questions?



What is the
Expected output?

Code integration?

Next Steps

- The research group will clean the code and provide instructions to build a standalone binary
- The India team will test this on their corpus of images
- If the results are encouraging, we will discuss the details of the integration