

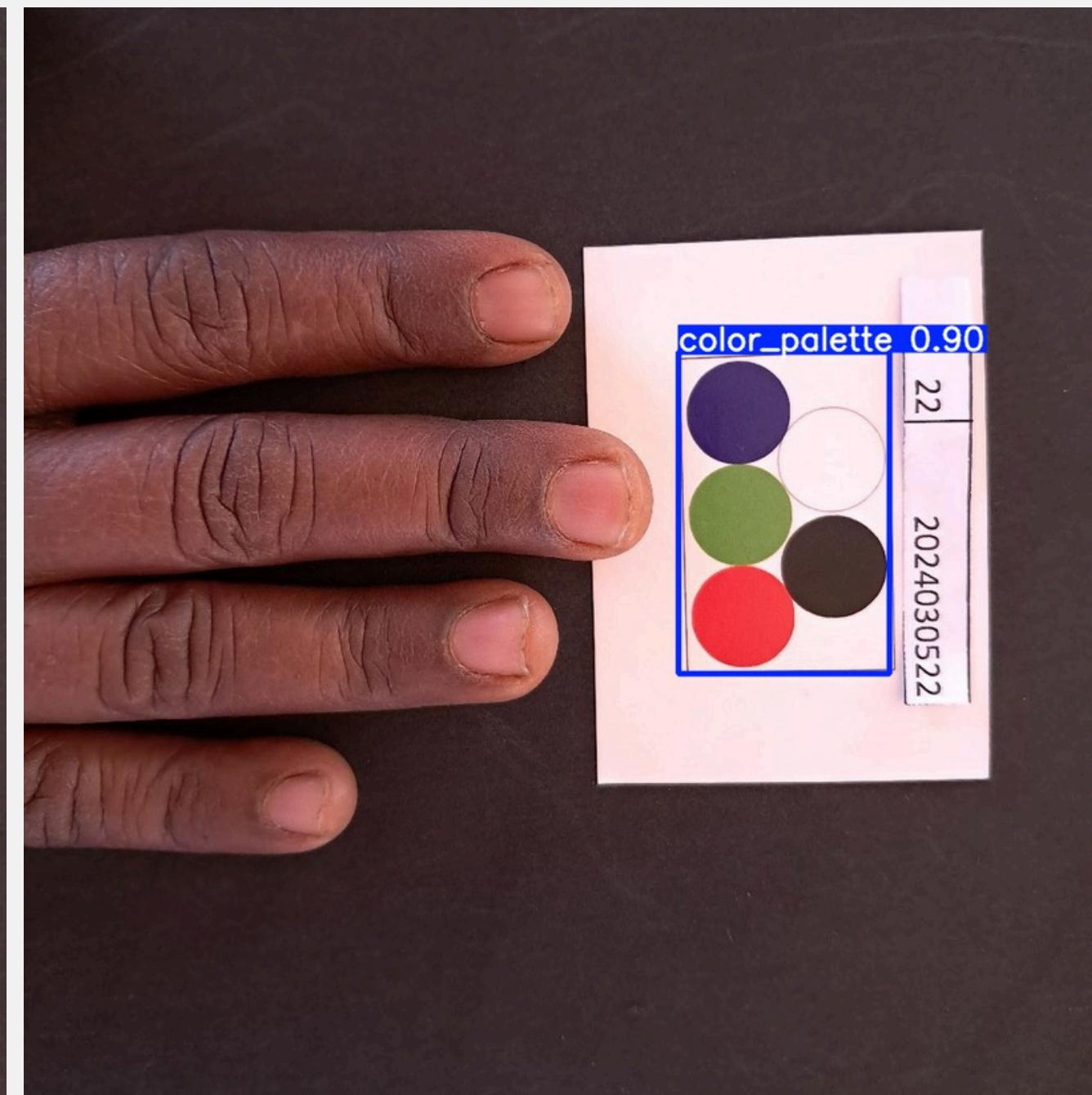
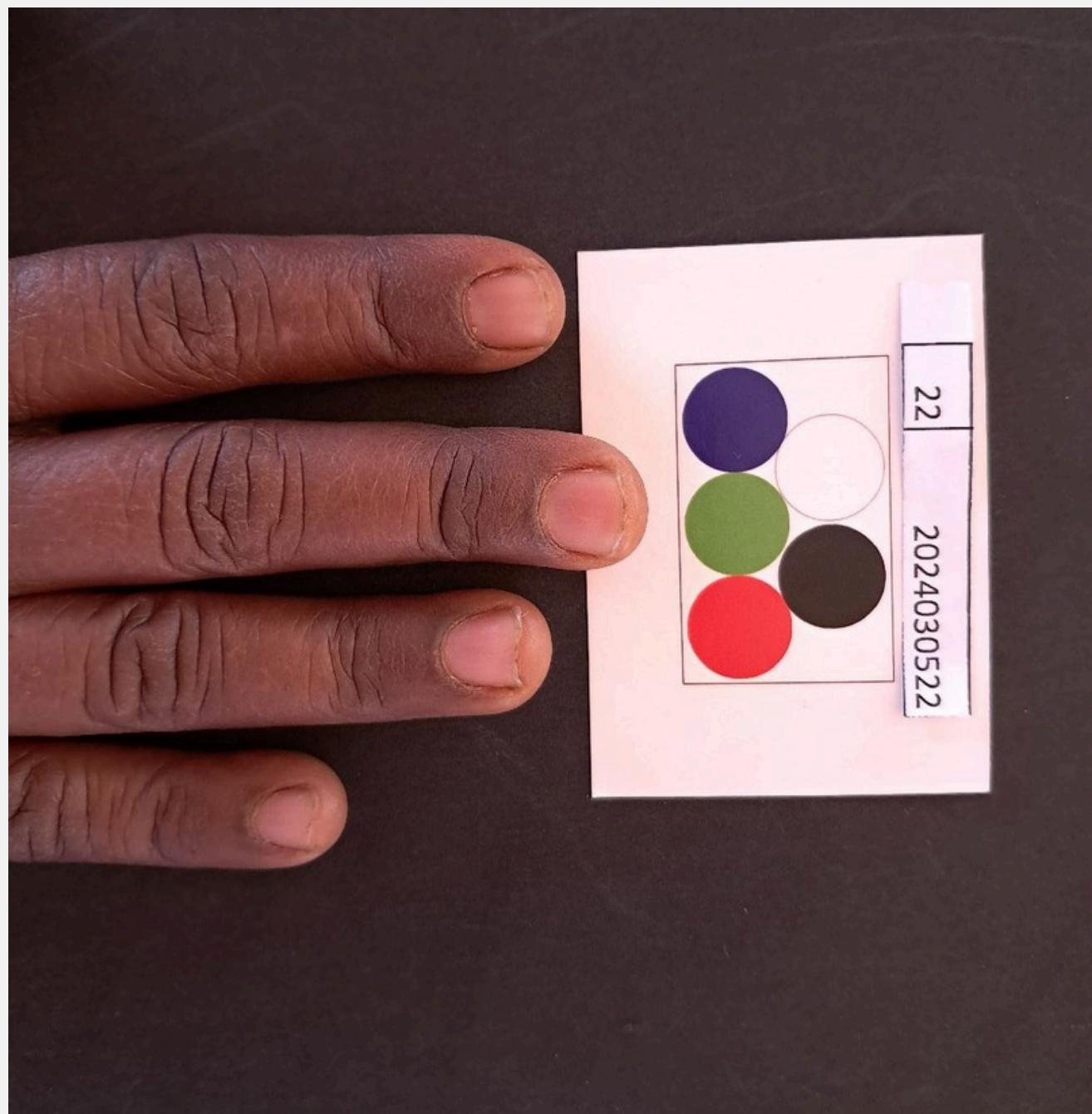
Hemoglobin Level Estimation from Photographic images

NIRANJAN VERMA
210020085

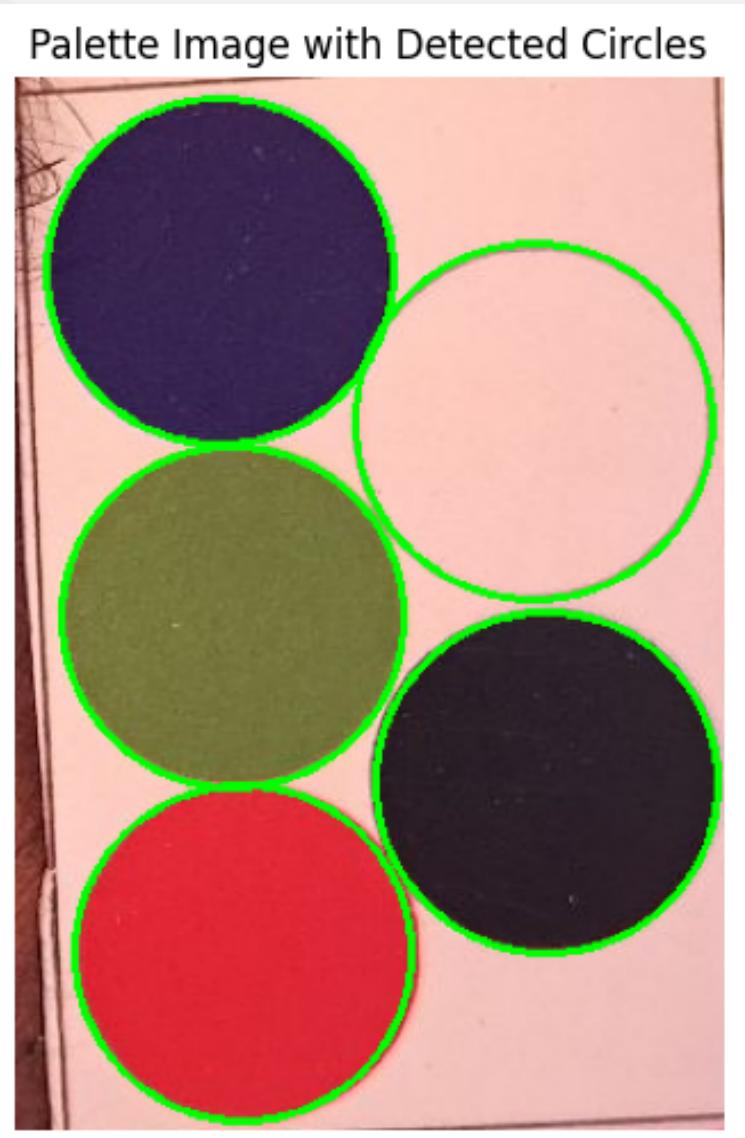
PROF. NIRMAL PUNJABI

Extract Color Palette

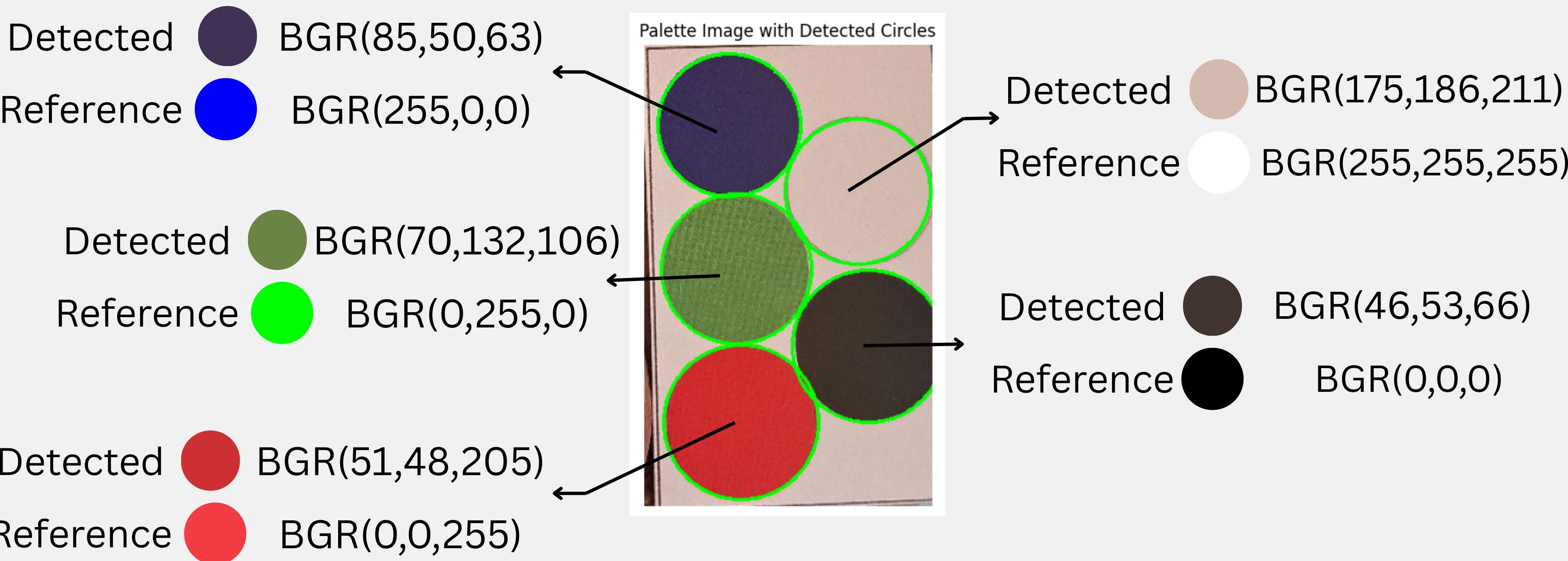
Done using Yolo Object detection



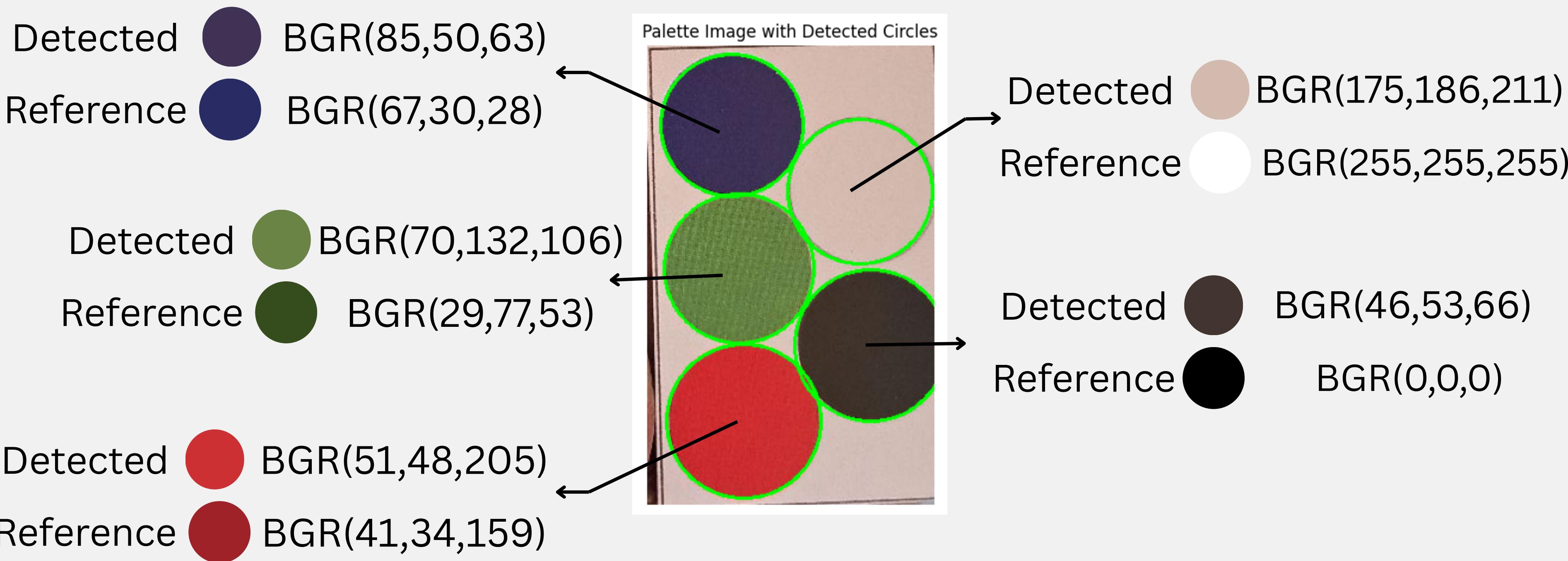
Hough Circle Detection



Mean Colors & Reference Colors



Mean Colors & New Reference Colors



Transformation

3x3 Matrix

$$R_{\text{ref}} = x_1 * R + y_1 * G + z_1 * B$$

$$G_{\text{ref}} = x_2 * R + y_2 * G + z_2 * B$$

$$B_{\text{ref}} = x_3 * R + y_3 * G + z_3 * B$$

$$\begin{Bmatrix} R' \\ G' \\ B' \end{Bmatrix} = M * \begin{Bmatrix} R \\ G \\ B \end{Bmatrix}$$

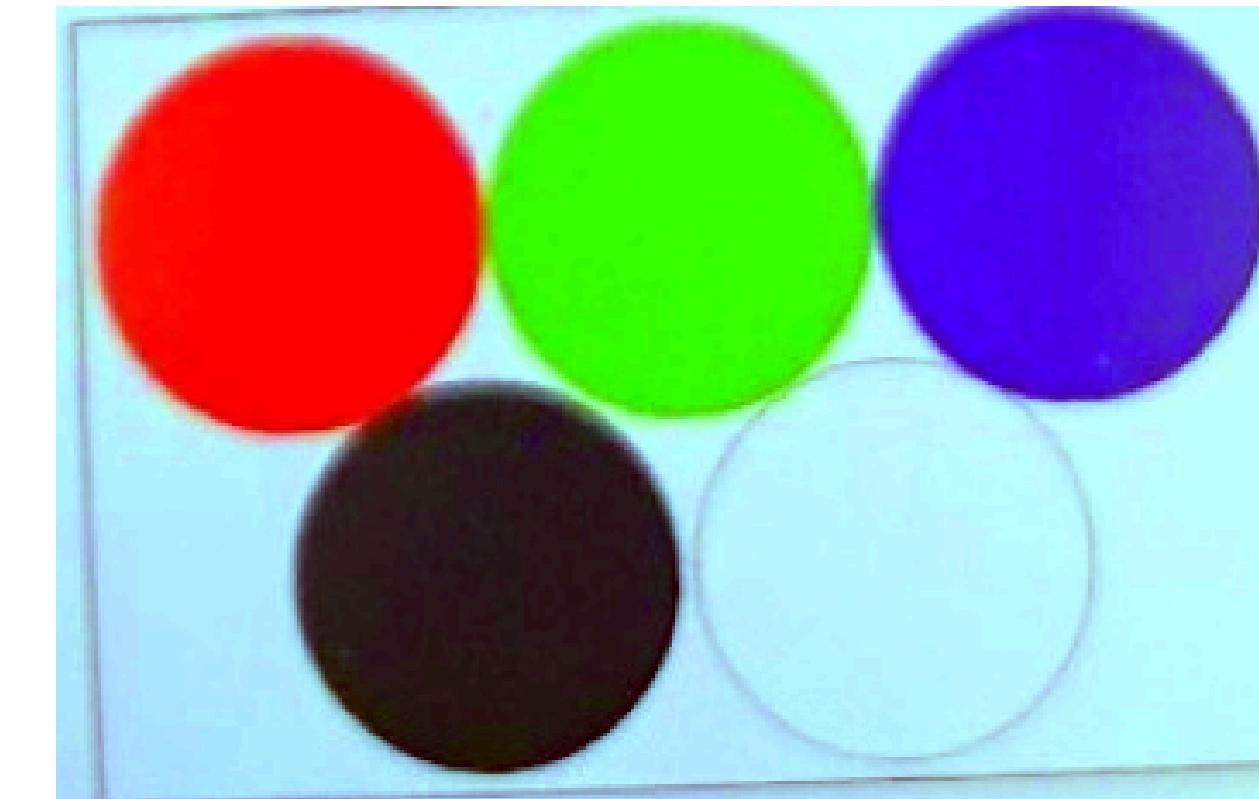
Transformation

Previous

Original Palette



Corrected Palette 3x3



New

Original Palette

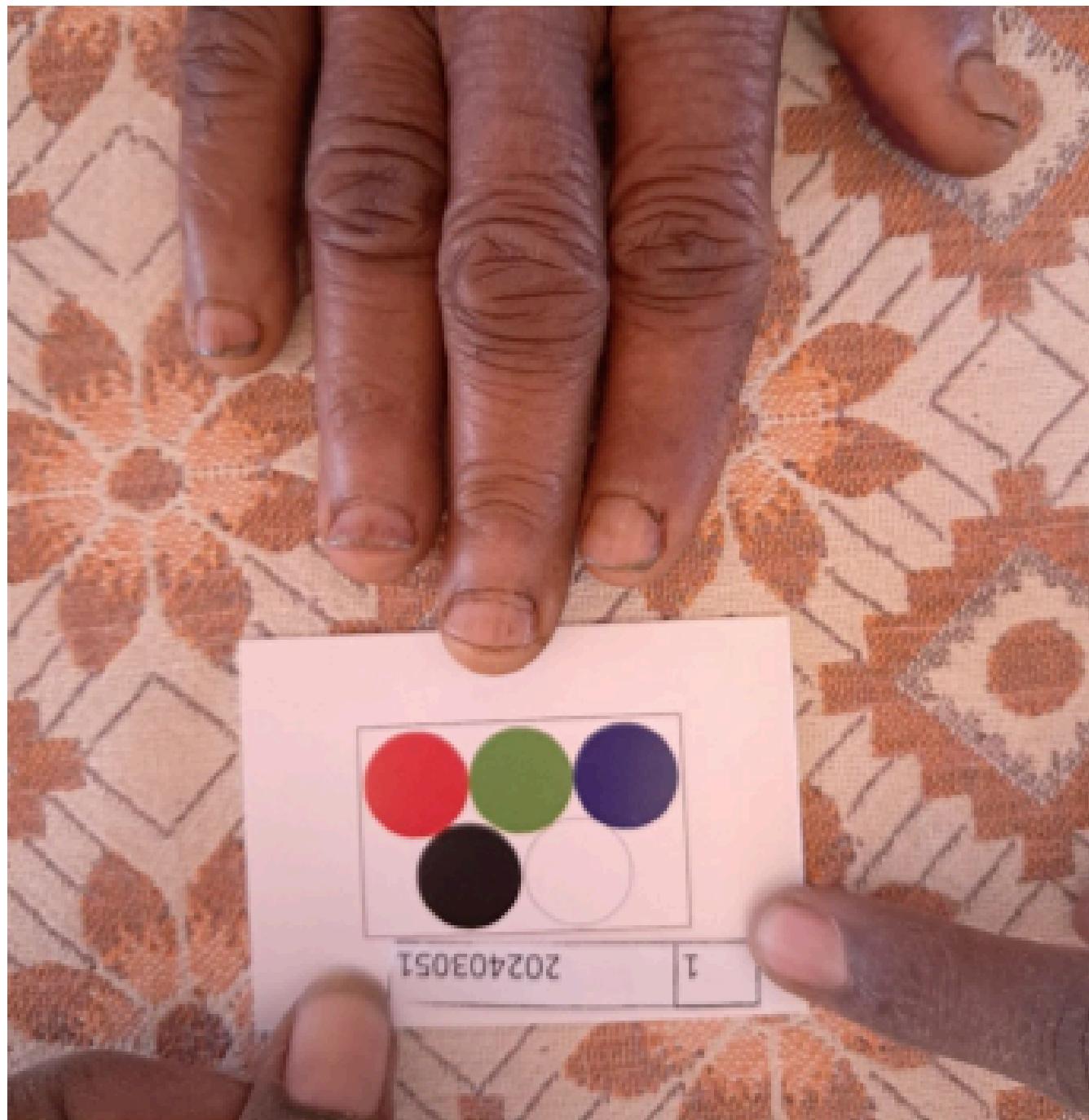


Corrected Palette 3x3

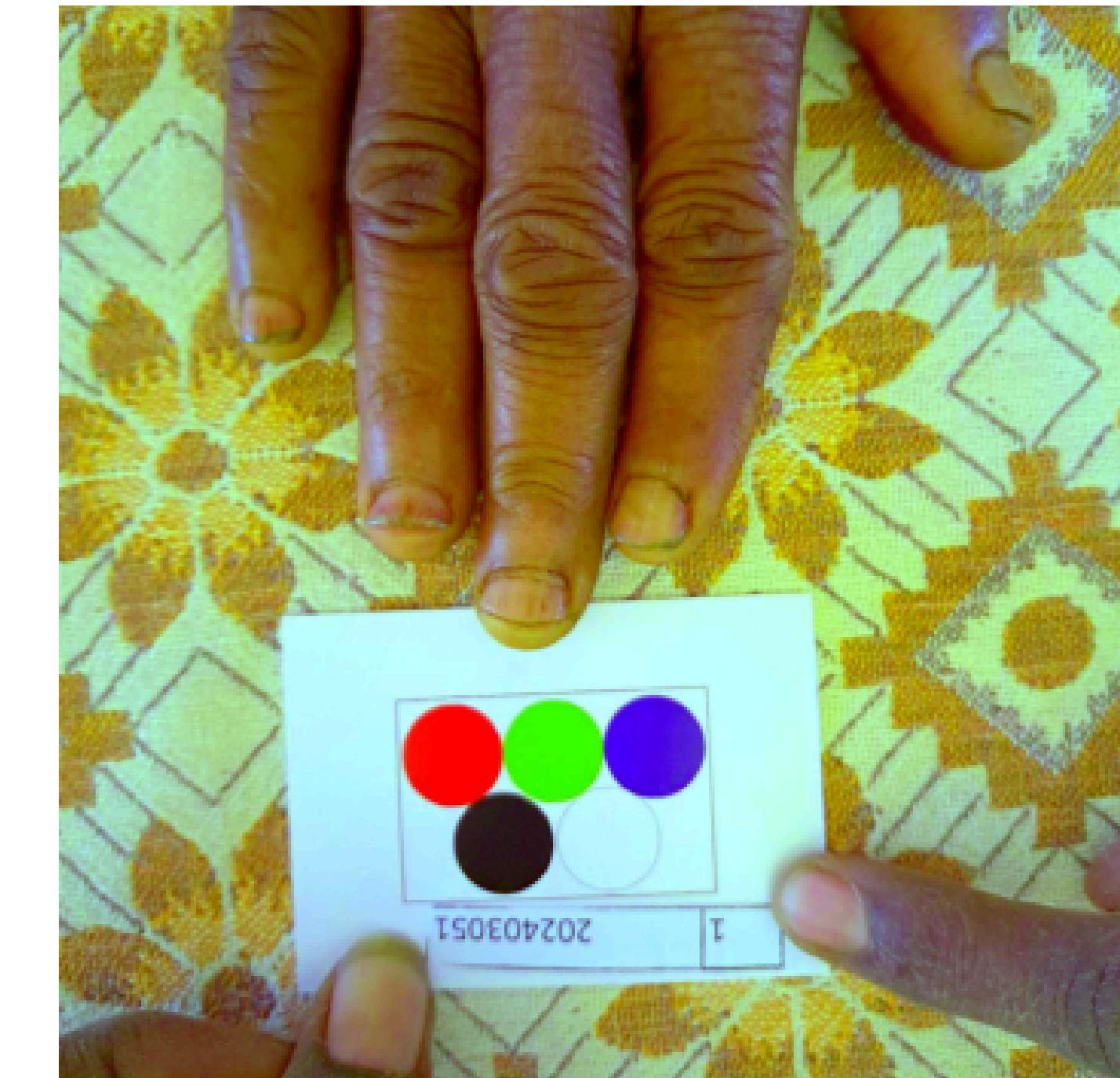


Transformation old

Original Image

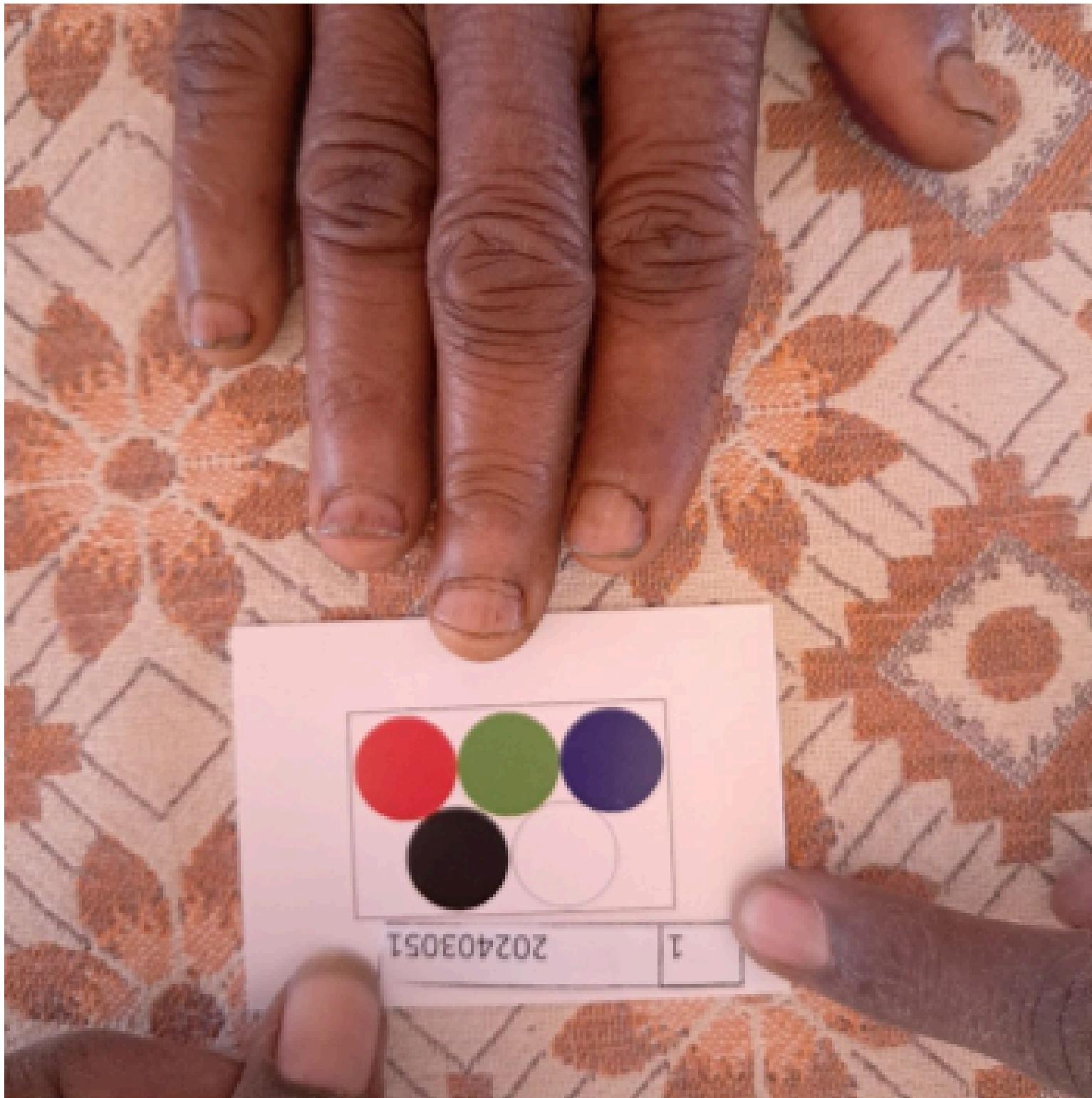


Transformed Image 3x3



Transformation new

Original Image



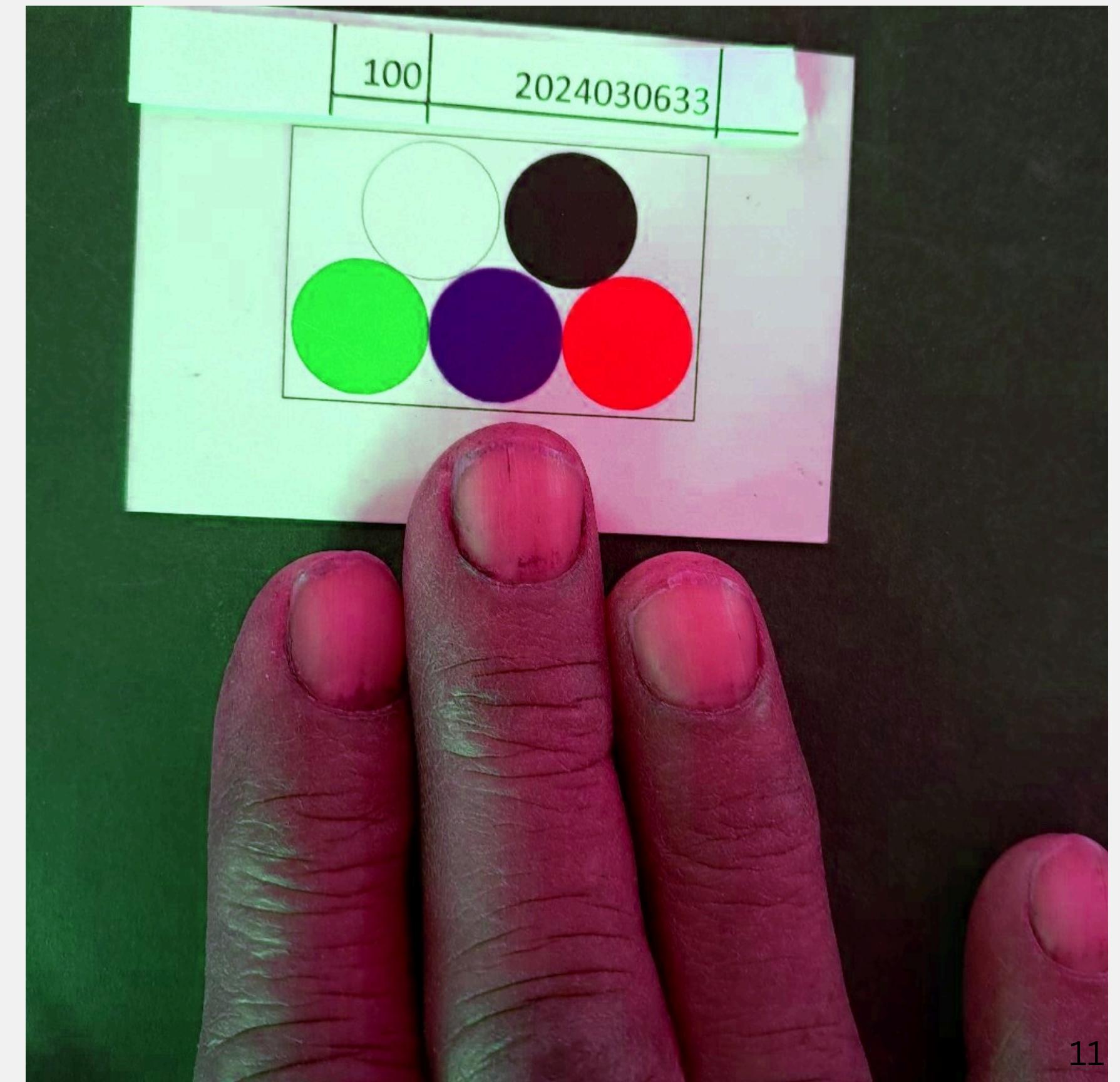
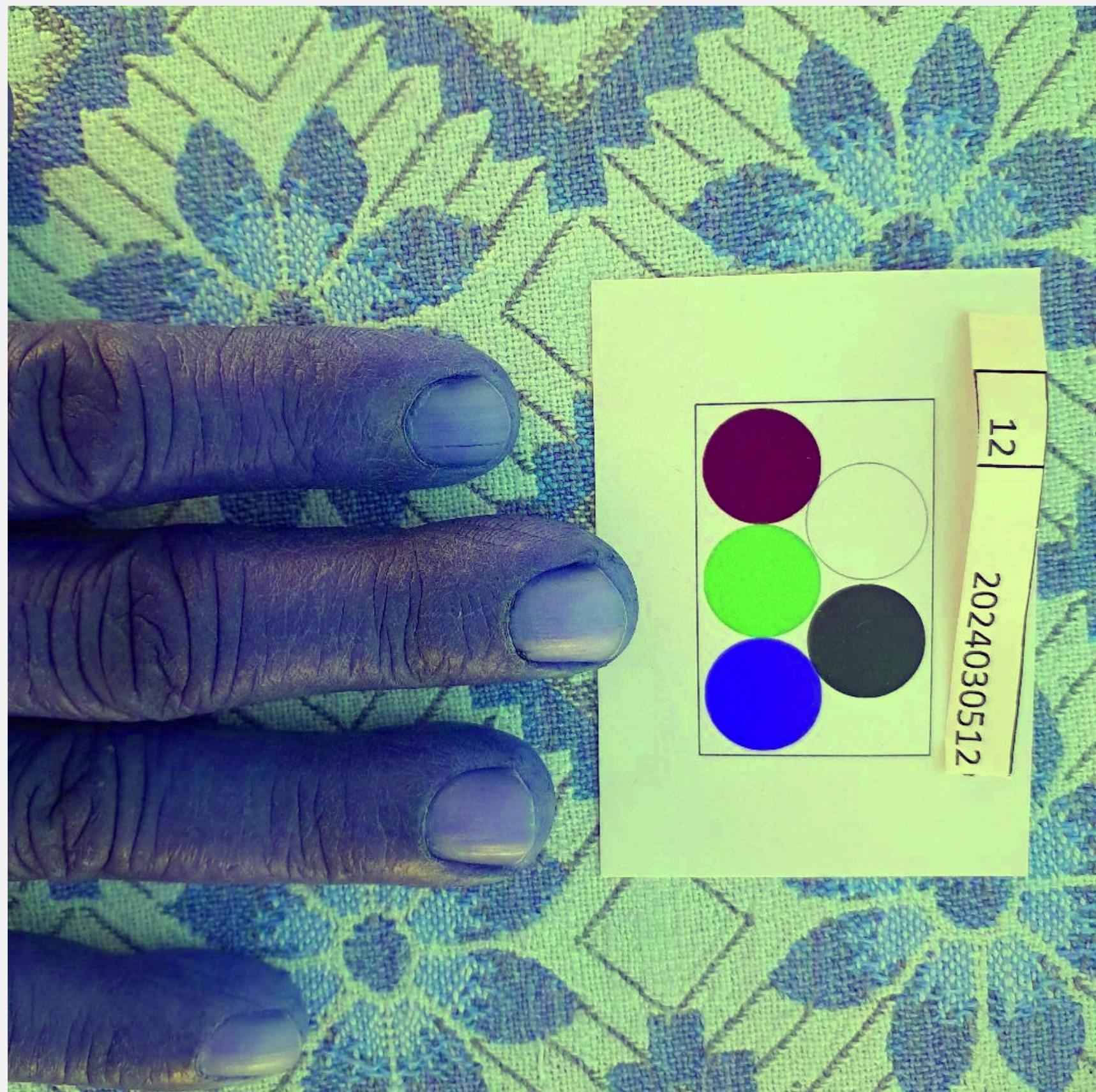
Transformed Image 3x3



Hough Circle Detection Problem

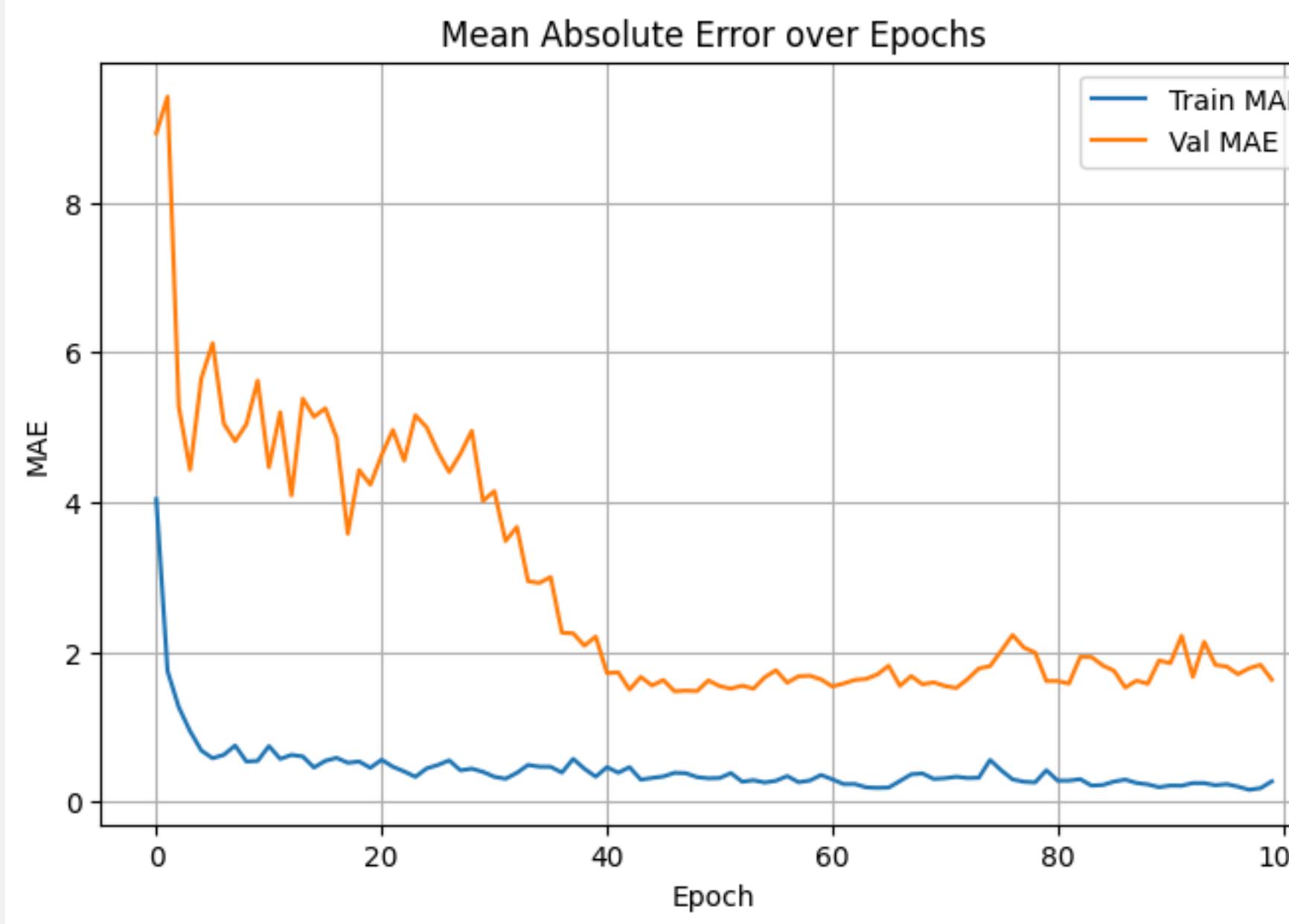


Problems



Fingernail resnet50

Without Color Calibration

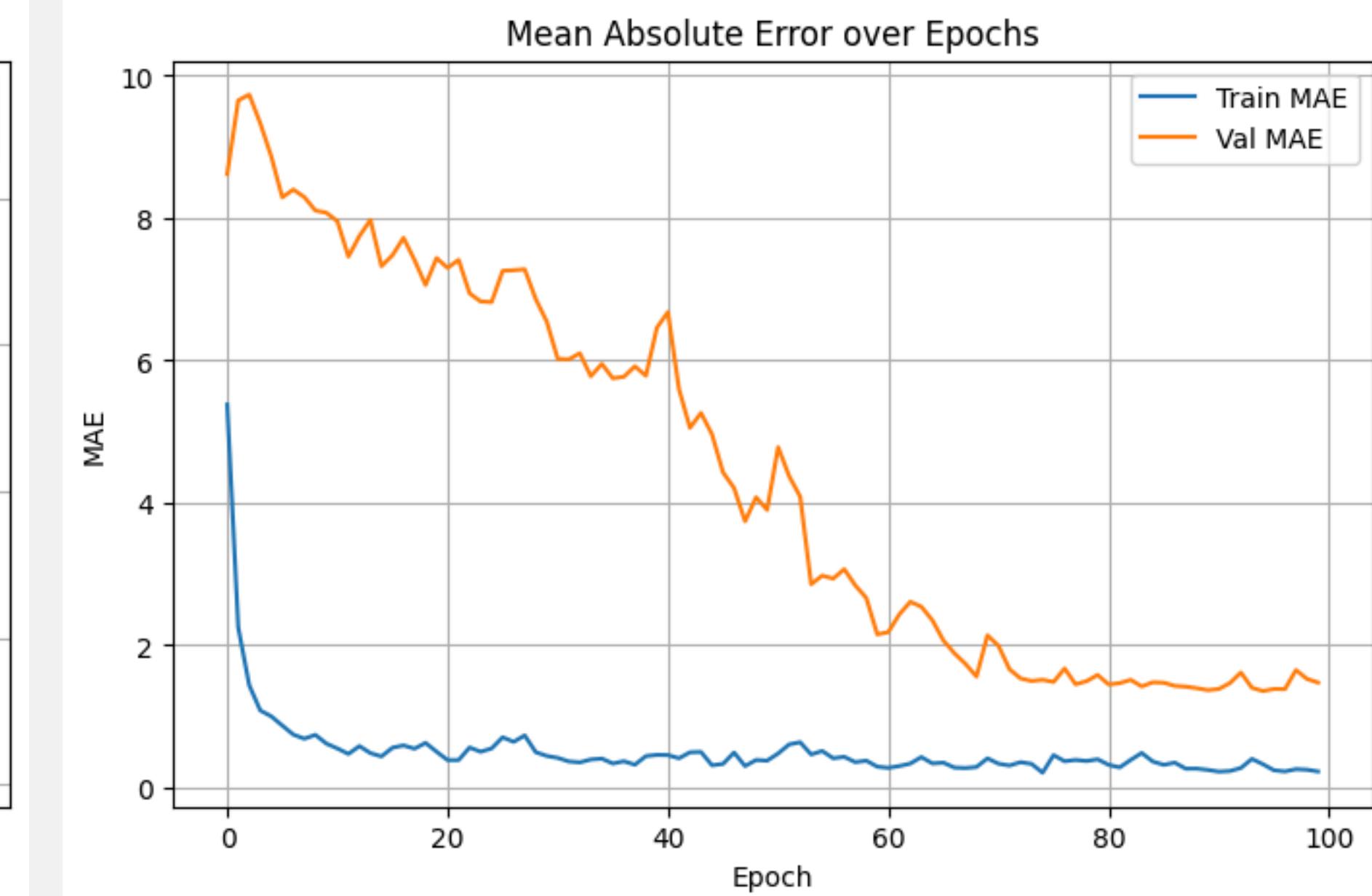


Train MAE: 0.3263

Validation MAE: 1.6327

Test MAE: 1.474

With Color Calibration



Train MAE: 0.2109

Validation MAE: 1.4775

Test MAE: 1.55

Thank you