Histogram Equalisation 14 Jan 2026

Anubhav Rathore Input: Image Output: Image (Histogram Equalised)

Contents

Defaults

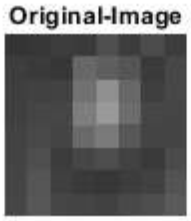
```
clc;
clear all;
close all;
```

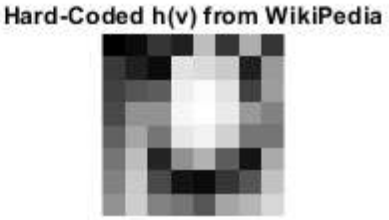
Wikipedia Example - Hardcoded Histogram Equalisation

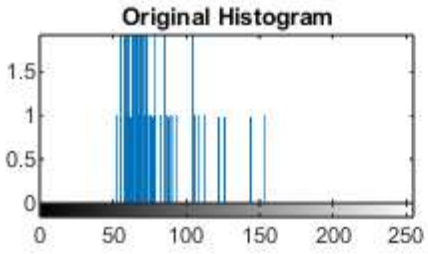
```
myImage =  [52  55      61      59      79      61      76      61
            62  59      55      104     94      85      59      71
            63  65      66      113     144     104     63      72
            64  70      70      126     154     109     71      69
            67  73      68      106     122     88      68      68
            68  79      60      70      77      66      58      75
            69  85      64      58      55      61      65      83
            70  87      69      68      65      73      78      90];
myImage = cast(myImage, "uint8");
subplot(3,2,1);
imshow(myImage);
title("Original-Image");

eq_img_1 = [0   12      53      32      190     53      174     53
            57  32      12      227     219     202     32      154
            65  85      93      239     251     227     65      158
            73  146     146     247     255     235     154     130
            97  166     117     231     243     210     117     117
            117 190     36      146     178     93      20      170
            130 202     73      20      12      53      85      194
            146 206     130     117     85      166     182     215];

eq_img_1 = cast(eq_img_1, "uint8");
subplot(3,2,2), imshow(eq_img_1), title("Hard-Coded h(v) from WikiPedia");
subplot(3,2,5), imhist(myImage), title("Original Histogram");
```



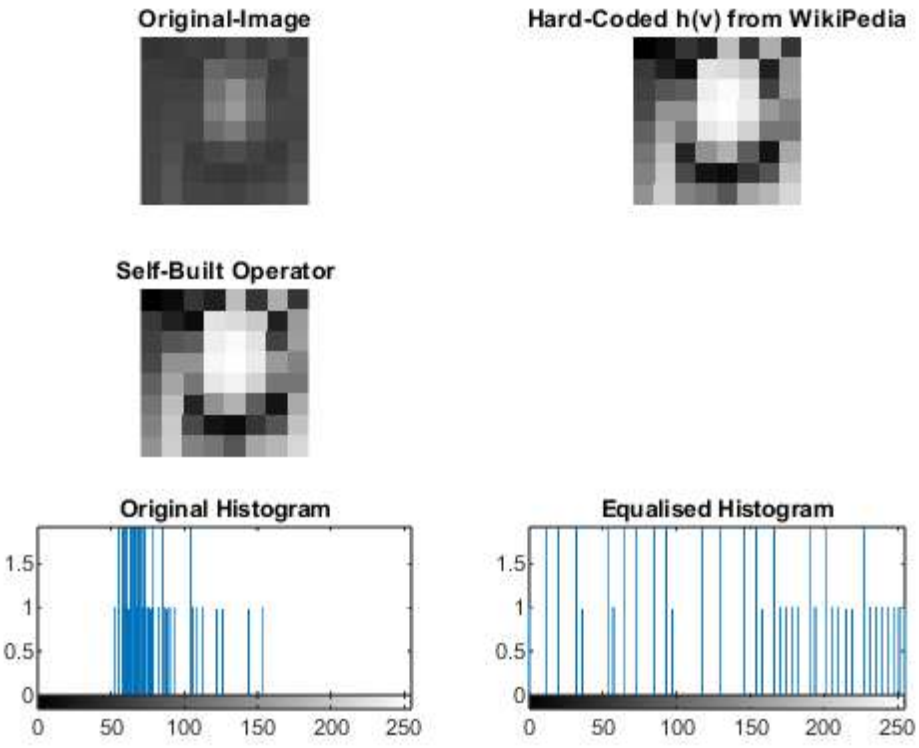




Self-Built Histogram Equalisation Operation

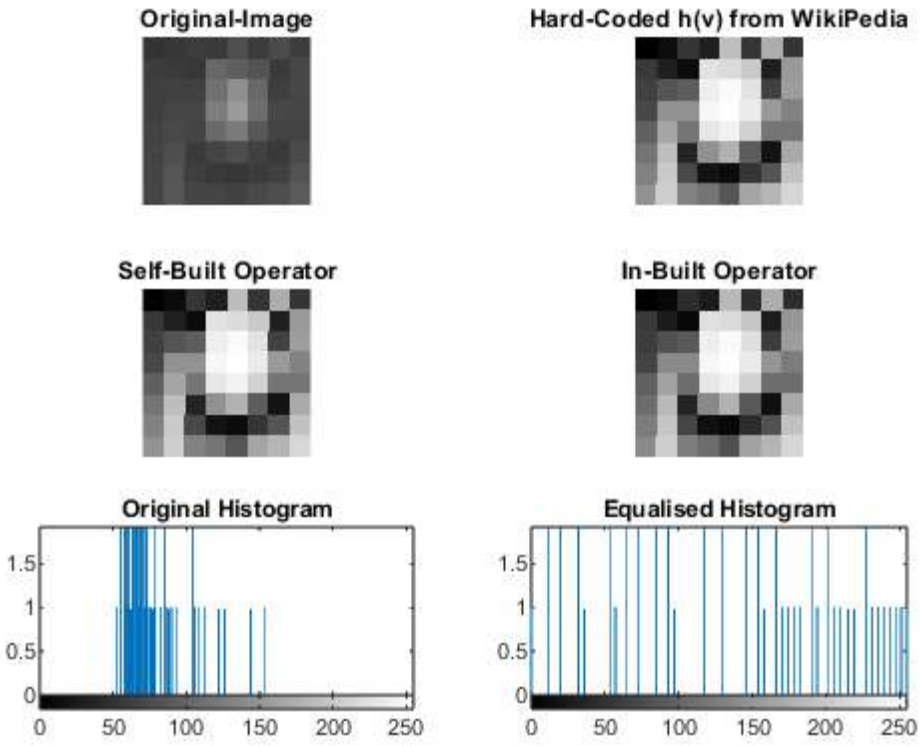
```
[R,C] = size(myImage);
counts = imhist(myImage);
cdf_counts = cumsum(counts);
cdf_min = cdf_counts(find(cdf_counts > 0, 1));
L = 256; % 8 bit image
eq_img_2 = zeros(R,C, "uint8");

for row = 1:R
    for col = 1:C
        curr_pixel = myImage(row,col);
        h_v = round(((cdf_counts(curr_pixel + 1) - cdf_min)/((R*C)-cdf_min))*(L-1));
        eq_img_2(row,col) = h_v;
    end
end
subplot(3,2,3), imshow(eq_img_2), title("Self-Built Operator");
subplot(3,2,6), imhist(eq_img_2), title("Equalised Histogram");
```



In-built operator

```
eq_img_3 = histeq(myImage);
subplot(3,2,4);
imshow(eq_img_3);
title("In-Built Operator");
```



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