**Digital Image Processing**

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1. *Interpolation by replication*

*MATLAB CODE:*

image = imread('goldhill256.bmp');

[r,c,x] = size(image);

N = zeros(2\*r,2\*c);

for i = 1:1:r

for j = 1:1:c

for k = j\*2:1:(j\*2+2)

N(2\*i,k) = image(i,j);

end

end

end

for i = 1:2:r\*2

for j = 1:1:c\*2

N(i,j) = N(i+1,j);

end

end

figure(1)

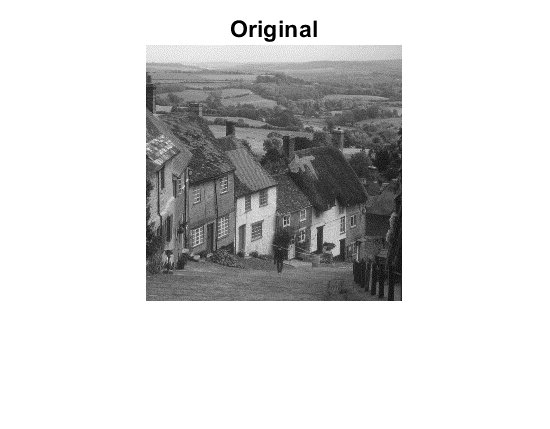
imshow(image);

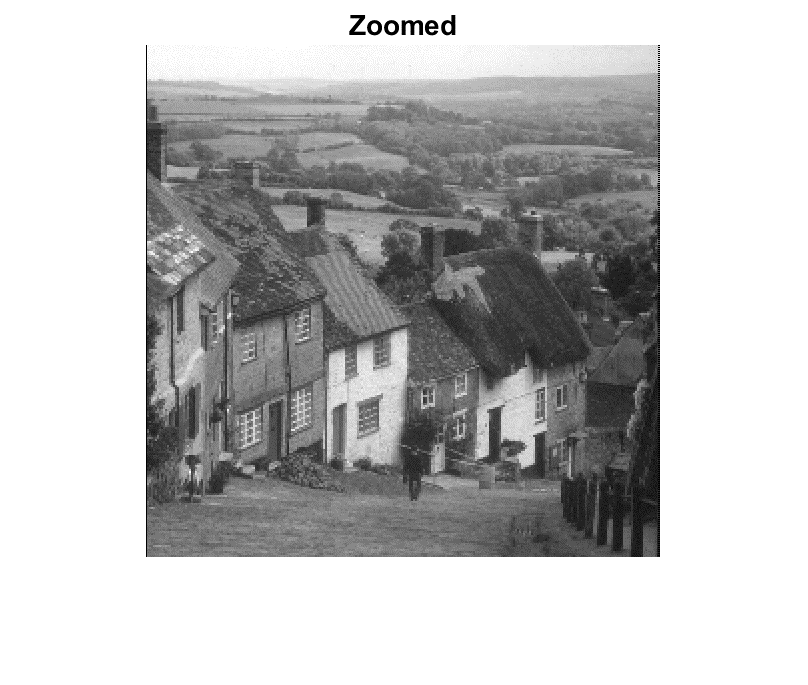
title('Original');

figure(3)

imshow(N,[]);

title('Zoomed')





1. *Linear Interpolator*

*MATLAB CODE:*

image = imread('goldhill256.bmp');

[r,c,x] = size(image);

N = zeros(2\*r,2\*c);

h = [1 1;1 1];

for i = 1:1:r

for j = 1:1:c

for k = j\*2:1:(j\*2+2)

N(2\*i,k) = image(i,j);

end

end

end

for i = 1:2:r\*2

for j = 1:1:c\*2

N(i,j) = N(i+1,j);

end

end

r = conv2(N,h/4,'valid');

figure(1)

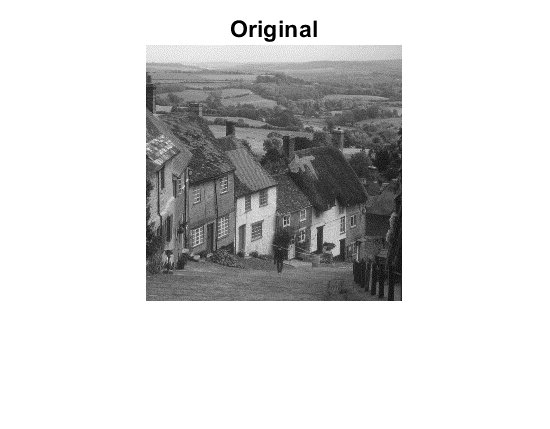
imshow(image);

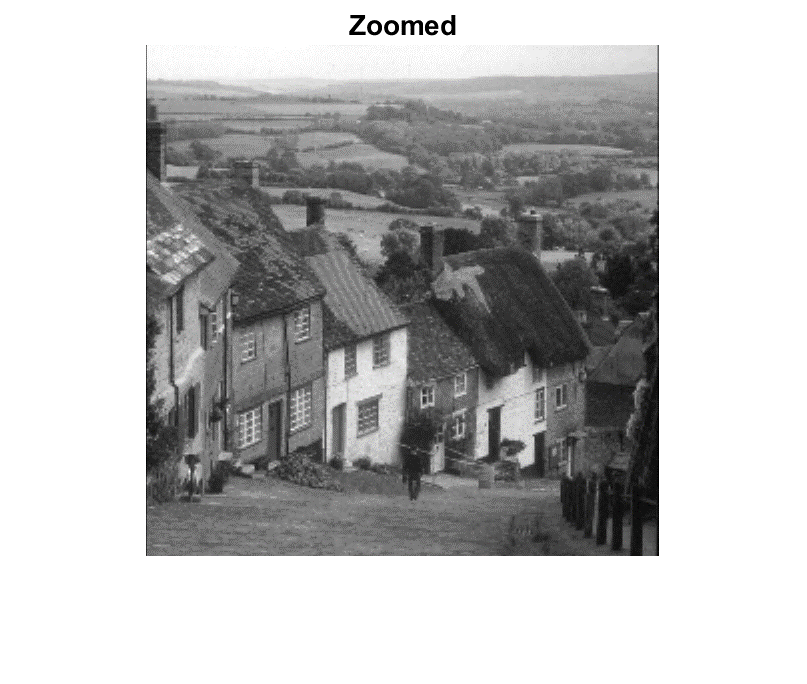
title('Original');

figure(3)

imshow(r,[]);

title('Zoomed')





1. *Cubic Spline Interpolator*

*MATLAB CODE:*

img = imread('goldhill256.bmp');

[m,n,x] = size(img);

k = 1;

l = 1;

f = 2;

zoom = zeros(m\*f,n\*f);

for i = 1:m

for j = 1:n

zoom(k,l) = img(i,j);

l=l+f;

end

k=k+f;

l = 1;

end

H = [1 1;1 1];

h1 = 0.25\*conv2(H,H);

h2 = 0.25\*conv2(h1,H);

h3 = 0.25\*conv2(h2,H);

r = conv2(zoom,h3,'valid');

figure(1);

imshow(img,[])

title('Orignal’);

figure(2)

imshow(uint8(r));

title('Zoomed');

