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Feature Set Up

This section will go throught the steps to extract some features that will be used to train our new NN. The one that dosen't "Blow Up" the cpu

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

Load the data that was extracted form the csv file earlier.

```
load TestingPixels.mat
load TrainingPixels.mat
```

Turn row data into a 48x48 img and resize

```
i = 3 ; % random image
figure ; colormap gray;
fim = reshape(trainingPixels(i, 2:end), [48,48])'; % row = 48 x 48
 image
imagesc(fim)                                    % show the image
title(num2str(trainingPixels(i, 1)))            % show the label


sfim = imresize(fim, 0.5);                      % Resize to 24 x 24
 img
imagesc(sfim);
```
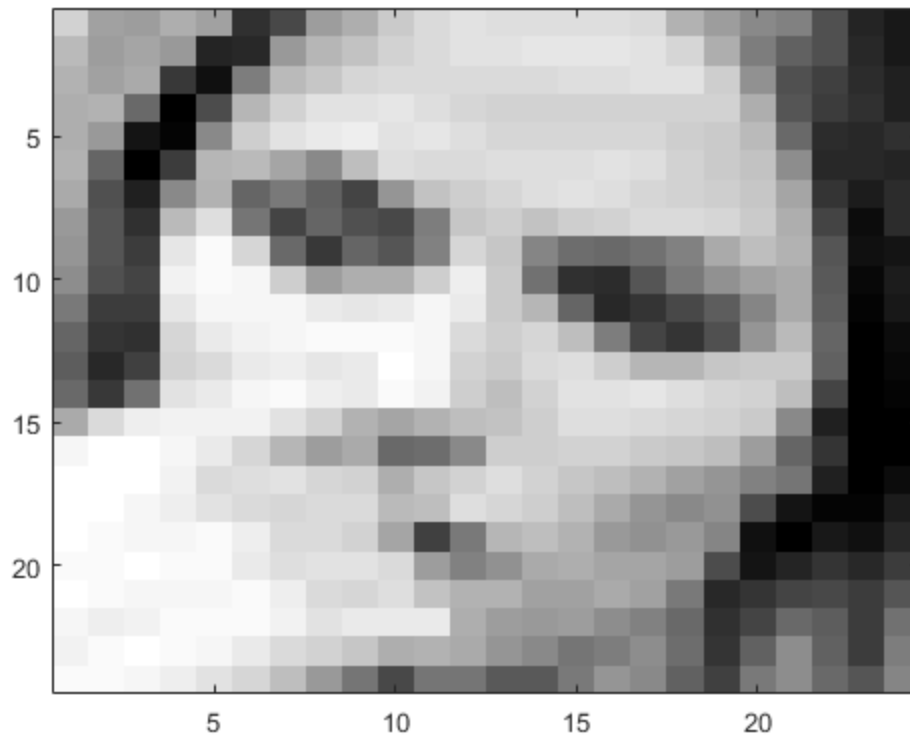
Frequency componenets from Nick submission

Applying the filters on input images

```
im1_fft   = fft2(sfim);


gh = fftshift(im1_fft);
```

Nuetralizing the Phase to display Magnitude only

```
im1_M = abs(gh);
```

Inverse fft2

```
restoredP1 = log(abs(ifft2(im1_M*exp(1i*0)))+1);


re = fftshift(restoredP1);
```
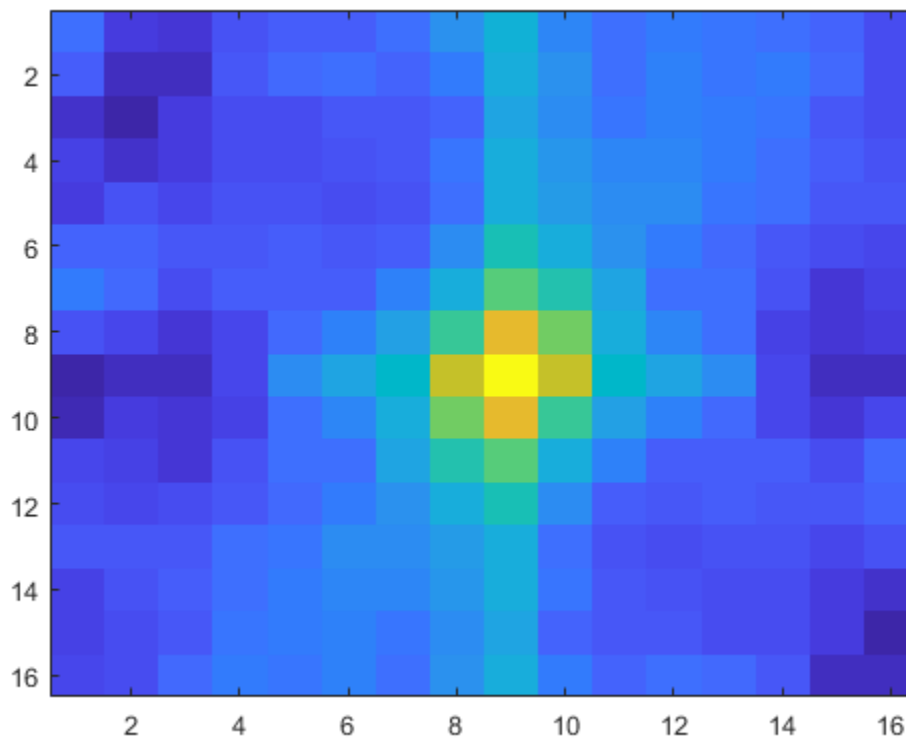
Calculating plotting limits

```
I_Mag_min = min(min(abs(restoredP1)));
I_Mag_max = max(max(abs(restoredP1)));

figure;
imshow(abs(re),[I_Mag_min I_Mag_max ]);
```


Extract lower frequencies by just cutting to 16 x 16

```
newRe = re(5:20,5:20);
figure; imagesc(newRe);
```

Reshape to return to NN

```
stuff = reshape(newRe, [1,256]);
```

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