```
function [ img ] = Haar_Reconstruct( img_hh, img_hl, img_lh, img_ll )

[w, h] = size( img_hh );

img_hh = double( img_hh );
img_hl = double( img_hl );
img_lh = double( img_lh );
img_ll = double( img_ll );

img_l_even = img_ll + img_lh;
img_l_odd = img_ll - img_lh;

img_h_even = img_hl + img_hh;
img_h_odd = img_hl - img_hh;

img_l = zeros(2*w, h);
img_h = zeros(2*w, h);

for i = 1:2*w

    if ( mod(i,2) == 0 )
        img_l(i, :) = img_l_even(i/2, :);
        img_h(i, :) = img_h_even(i/2, :);
    else
        img_l(i, :) = img_l_odd((i+1)/2, :);
        img_h(i, :) = img_h_odd((i+1)/2, :);
    end

end

img = zeros( 2*w, 2*h );
img_even = img_l + img_h;
img_odd = img_l - img_h;

for i = 1:2*h

    if ( mod(i,2) == 0 )
        img(:,i) = img_even(:, i/2);
    else
        img(:,i) = img_odd(:, (i+1)/2);
    end

end

img = uint8( img );

end
```