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                                identify_features
function [region_matrix N S_mat feature_score_vector] = identify_features(I)

[N Y X] = mw_sq_std_dev(I);
[A B C D] = score_image(I,N,X,Y);
S_mat = vec2mat(D,N);
s = std(S_mat(:))^2;
region_matrix = gather_regions_delta(N,S_mat,s);
temp = max(S_mat(:));

num_iterations = floor(50*s);

for i = 1:num_iterations

    region_matrix_1 = gather_regions_delta(N,S_mat,(i/num_iterations)*s);
    region_matrix_2 = gather_regions_delta(N,S_mat,((i+1)/num_iterations)*s);
    delta = (entropy(region_matrix_1) - entropy(region_matrix_2))^2;

    if(delta < temp)

        temp = delta;
        region_matrix = region_matrix_1;

    endif

endfor

num_regions = max(region_matrix(:));

for i = 1 : num_regions %assembles a vector that contains the score of each feature
in the image

    reg = extract_region(I,N,region_matrix,i);
    [N_2 X_2 Y_2] = mw_sq_std_dev(reg);
    x = calc_avg_colors(reg,N_2);
    score = [N_2 X_2 Y_2 x];
    feature_score_vector{i} = score;

endfor

endfunction

```