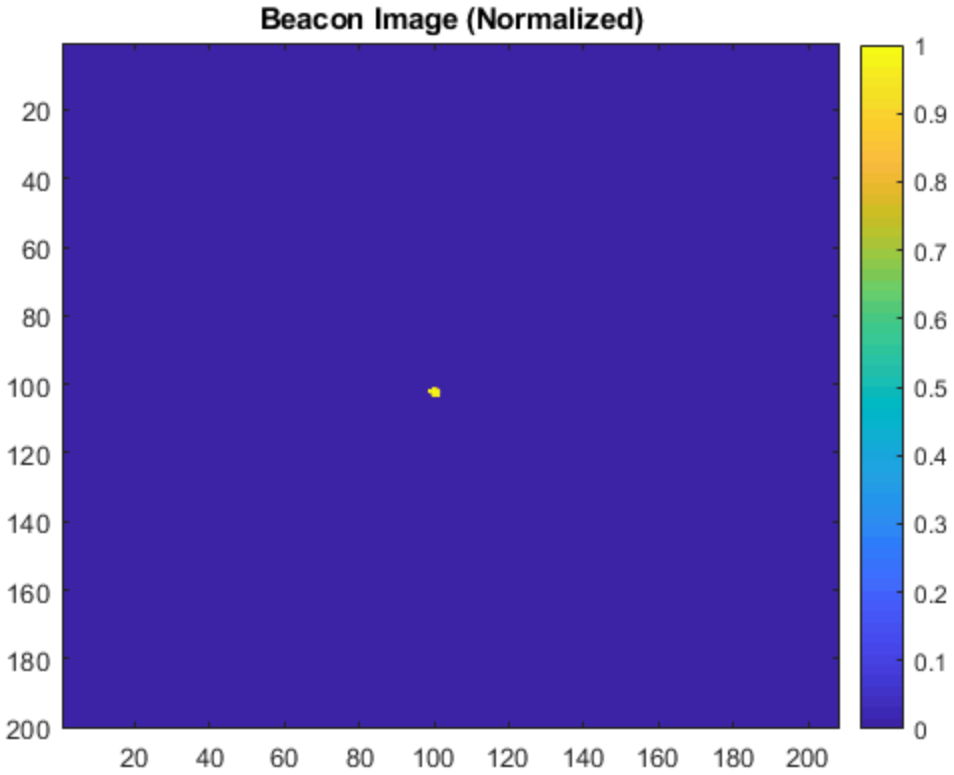
```
%Assess Beacon Spot
addpath('2dgaussian301');
addpath('data');
sigma_req = 0.5*(0.95/0.963)*4.2; %uplink budget has a 96.3% airy
 radius of 4.2, or about a 2 sigma (95%) of 4.1433
filename = 'data/2020-09-12-22-35-35_ACQUISITION_exp_275.png';
imdata = imread(filename);
imdata_normalized = imdata/max(max(imdata));
figure;
imagesc(imdata_normalized);
title('Beacon Image (Normalized)');
colorbar;

sz = size(imdata_normalized);
[xi,yi] = meshgrid(1:sz(2), 1:sz(1));
zi = double(imdata_normalized);
results = autoGaussianSurf(xi,yi,zi);
disp(['file: ', filename]);
disp(results);
disp(['sigma_req = ', num2str(sigma_req)]);
if((results.sigmax <= sigma_req) && (results.sigmay <= sigma_req))
    disp('(results.sigmax <= sigma_req)) and (results.sigmax <=
 sigma_req)');
    disp('PASSED');
else
    disp('(results.sigmax > sigma_req)) or (results.sigmax >
 sigma_req)');
    disp('FAILED');
end
hold on;
gaussian_fit = @(xi,yi,results) results.a*exp(-((xi-results.x0).^2/2/
results.sigmax^2 + (yi-results.y0).^2/2/results.sigmay^2)) +
 results.b;
contour(xi,yi,results.G,gaussian_fit(results.x0 + results.sigmax,
 results.y0, results));
hold off;
```

Iteration	*Func-count*	*f(x)*	*Norm of step*	*First-order optimality*
0	*1*	*1.66719*		*53.2*
1	*2*	*1.50502*	*0.359237*	*47.6*
2	*3*	*1.50502*	*0.439698*	*47.6*
3	*4*	*1.47225*	*0.109925*	*38.3*
4	*5*	*1.43716*	*0.0274811*	*24.5*
5	*6*	*1.4214*	*0.0274811*	*15.4*
6	*7*	*1.41287*	*0.0274811*	*7.38*
7	*8*	*1.41055*	*0.00687028*	*2.74*
8	*9*	*1.41055*	*0.00171757*	*2.74*
9	*10*	*1.41053*	*0.000429393*	*2.67*
10	*11*	*1.4105*	*0.000107348*	*2.6*
11	*12*	*1.4105*	*2.6837e-05*	*2.57*

```
    12          13          1.41049     6.70926e-06           2.56
    13          14          1.41049     1.67732e-06           2.56
    14          15          1.41049     4.19329e-07           2.56

Local minimum possible.

lsqcurvefit stopped because the size of the current step is less than
the default value of the step size tolerance.



file: data/2020-09-12-22-35-35_ACQUISITION_exp_275.png
         a: 1.9225
         b: 0.0017
        x0: 100.2028
        y0: 102.2028
    sigmax: 0.9946
    sigmay: 0.9927
         G: [200×208 double]
       sse: 2.8197
      sse0: 5.9991
        r2: 0.5300

sigma_req = 2.0717
(results.sigmax <= sigma_req)) and (results.sigmax <= sigma_req)
PASSED
```



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