

```
I1 = imread('left.jpeg');
I2 = imread('right.jpeg');

% Convert to grayscale.
I1gray = rgb2gray(I1);
I2gray = rgb2gray(I2);
```

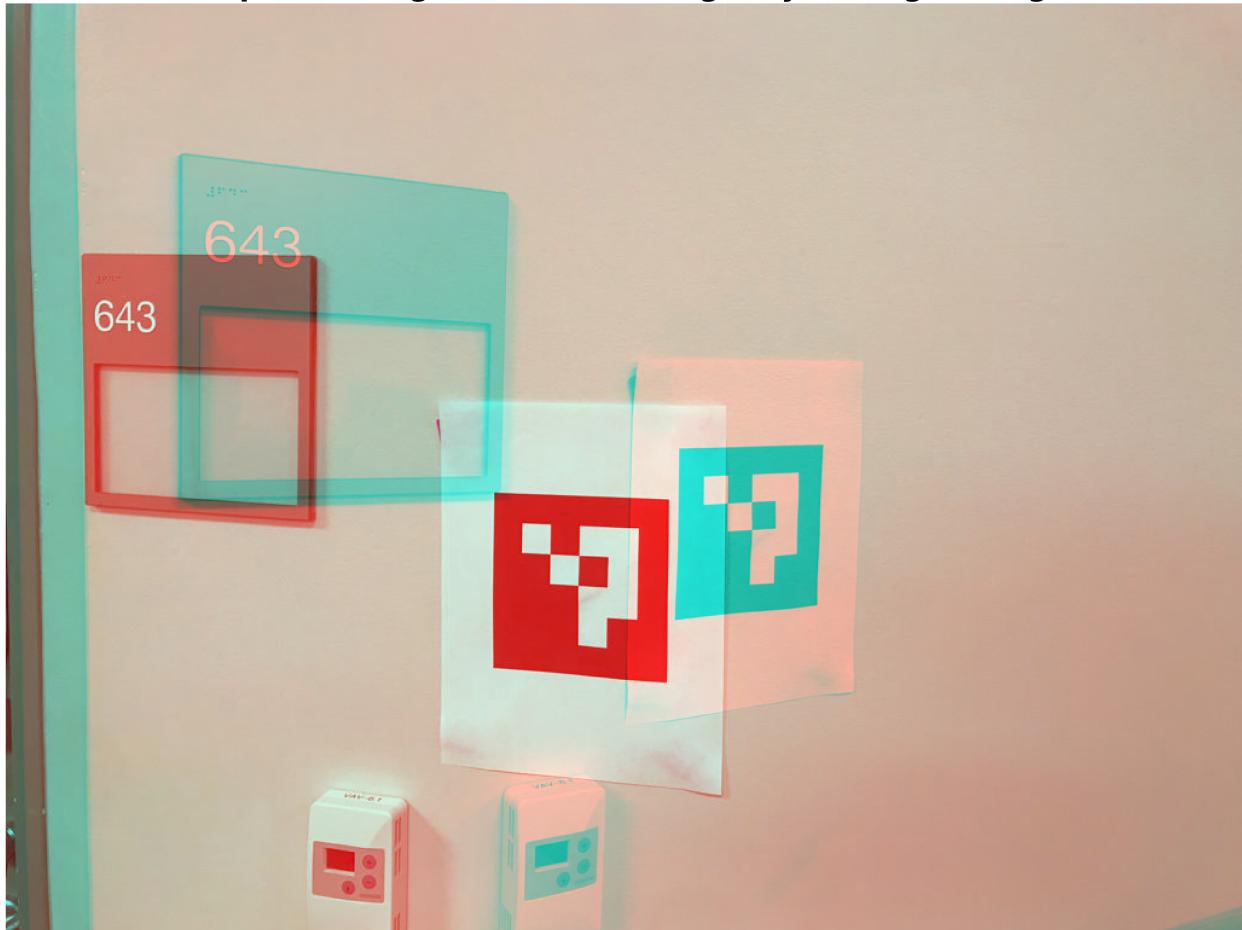
```
figure;
imshowpair(I1, I2, 'montage');
title('I1 (left); I2 (right)');
```

**I1 (left); I2 (right)**



```
figure;
imshow(stereoAnaglyph(I1,I2));
title('Composite Image (Red - Left Image, Cyan - Right Image)');
```

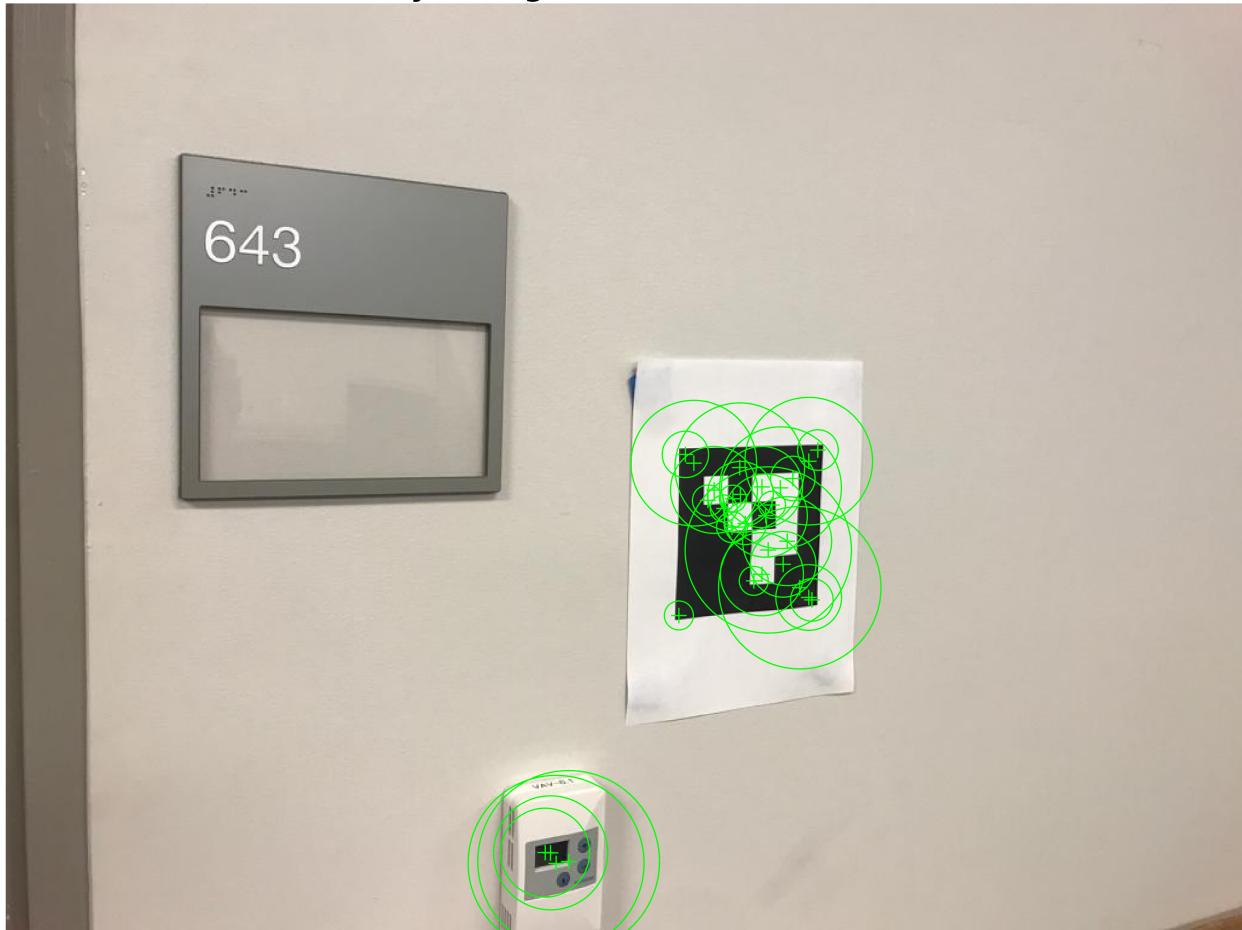
### Composite Image (Red - Left Image, Cyan - Right Image)



```
blobs1 = detectSURFFeatures(I1gray, 'MetricThreshold', 2000);  
blobs2 = detectSURFFeatures(I2gray, 'MetricThreshold', 2000);
```

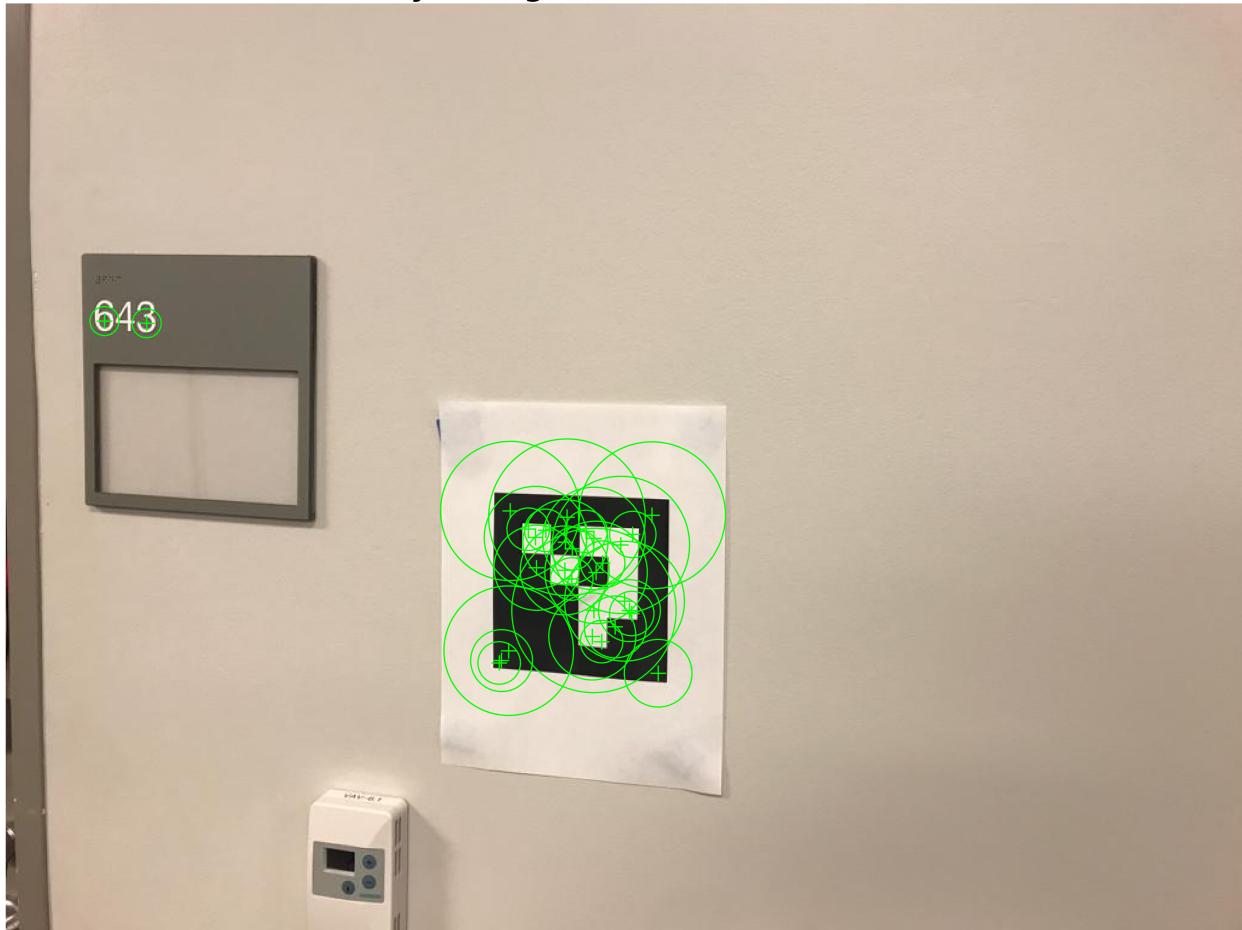
```
figure;  
imshow(I1);  
hold on;  
plot(selectStrongest(blobs1, 30));  
title('Thirty strongest SURF features in I1');
```

### Thirty strongest SURF features in I1



```
figure;
imshow(I2);
hold on;
plot(selectStrongest(blobs2, 30));
title('Thirty strongest SURF features in I2');
```

### Thirty strongest SURF features in I2

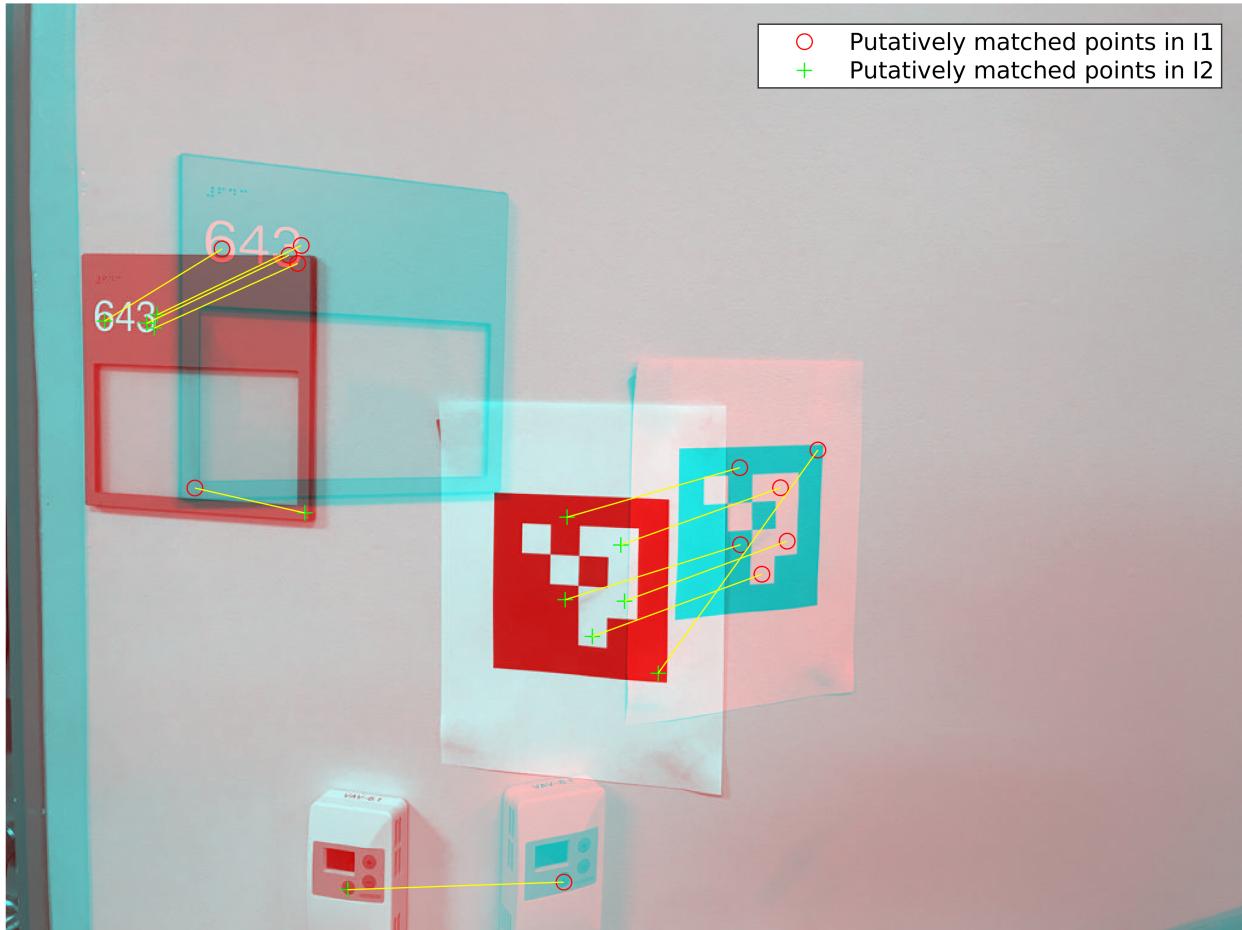


```
[features1, validBlobs1] = extractFeatures(I1gray, blobs1);
[features2, validBlobs2] = extractFeatures(I2gray, blobs2);
```

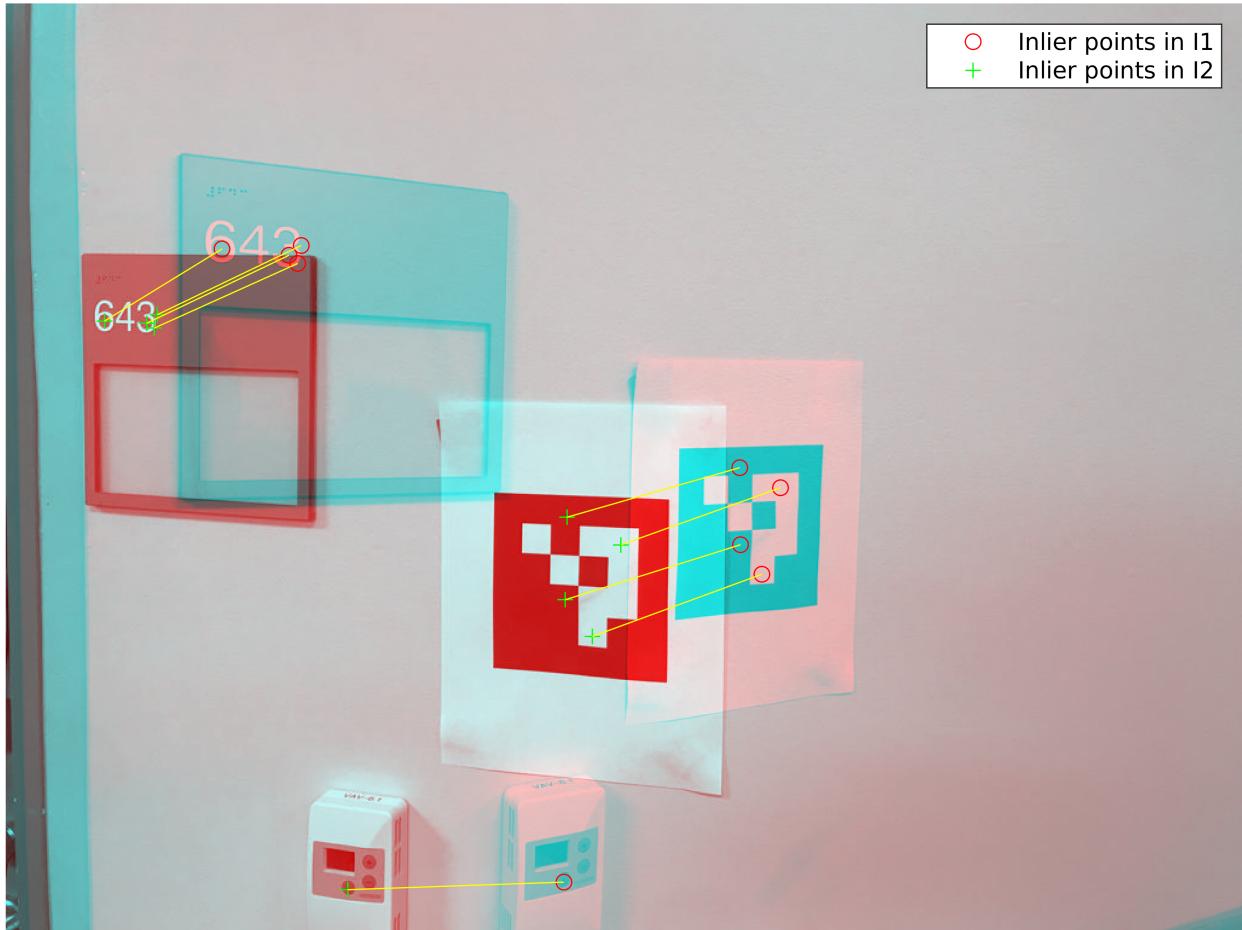
```
indexPairs = matchFeatures(features1, features2, 'Metric', 'SAD', ...
    'MatchThreshold', 5);
```

```
matchedPoints1 = validBlobs1(indexPairs(:,1),:);
matchedPoints2 = validBlobs2(indexPairs(:,2),:);
```

```
figure;
showMatchedFeatures(I1, I2, matchedPoints1, matchedPoints2);
legend('Putatively matched points in I1', 'Putatively matched points in I2');
```



```
[fMatrix, epipolarInliers, status] = estimateFundamentalMatrix(...  
    matchedPoints1, matchedPoints2, 'Method', 'RANSAC', ...  
    'NumTrials', 100, 'DistanceThreshold', 0.1, 'Confidence', 99.99);  
  
if status ~= 0 || isEpicpoleInImage(fMatrix, size(I1)) ...  
|| isEpicpoleInImage(fMatrix', size(I2))  
error(['Either not enough matching points were found or '...  
    'the epipoles are inside the images. You may need to '...  
    'inspect and improve the quality of detected features ',...  
    'and/or improve the quality of your images.']);  
end  
  
inlierPoints1 = matchedPoints1(epipolarInliers, :);  
inlierPoints2 = matchedPoints2(epipolarInliers, :);  
  
figure;  
showMatchedFeatures(I1, I2, inlierPoints1, inlierPoints2);  
legend('Inlier points in I1', 'Inlier points in I2');
```



```
[t1, t2] = estimateUncalibratedRectification(fMatrix, ...
    inlierPoints1.Location, inlierPoints2.Location, size(I2));
tform1 = projective2d(t1);
tform2 = projective2d(t2);
```

```
[I1Rect, I2Rect] = rectifyStereoImages(I1, I2, tform1, tform2);
figure;
imshow(stereoAnaglyph(I1Rect, I2Rect));
title('Rectified Stereo Images (Red - Left Image, Cyan - Right Image)');
```

**Rectified Stereo Images (Red - Left Image, Cyan - Right Image)**

