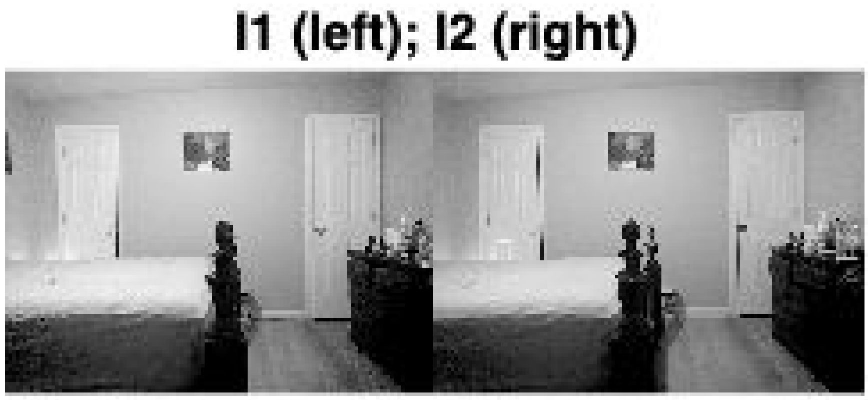
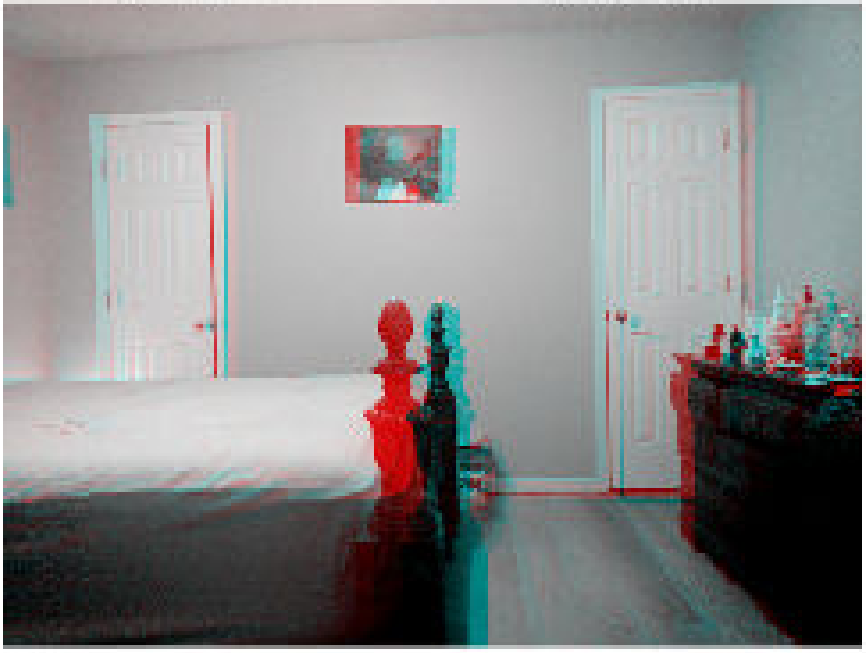
```
I1 = imread("./images/image_left.png");
I2 = imread("./images/image_right.png");

% Convert to grayscale.
I1gray = im2gray(I1);
I2gray = im2gray(I2);


% Display both images side by side.
figure
imshowpair(I1,I2,"montage")
title("I1 (left); I2 (right)")
```



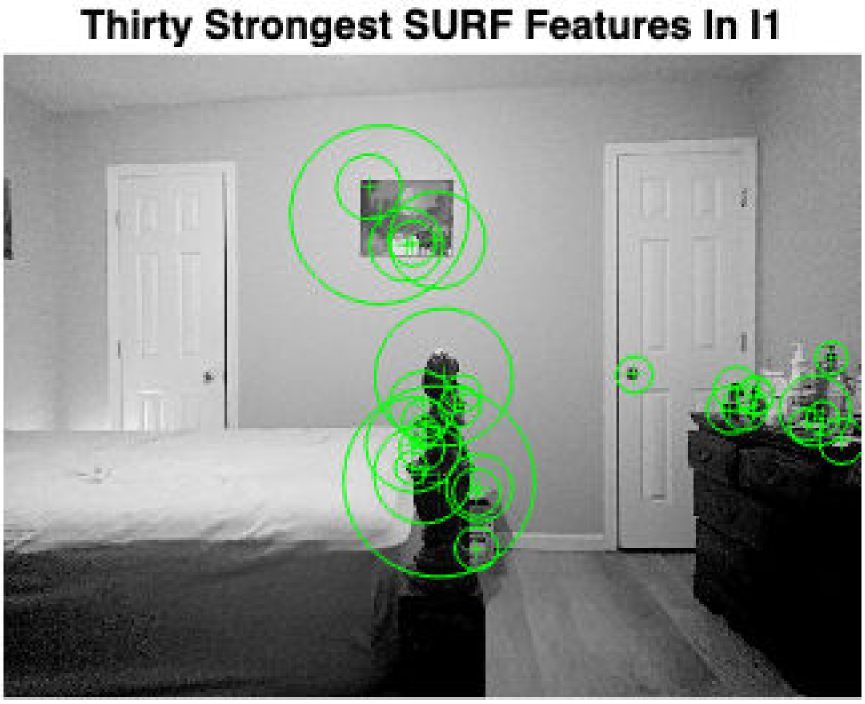
I1 (left); I2 (right)

```

% color composite demonstrating the pixel-wise differences between the images
figure
imshow(stereoAnaglyph(I1,I2))
title("Composite Image (Red - Left Image, Cyan - Right Image)")
```

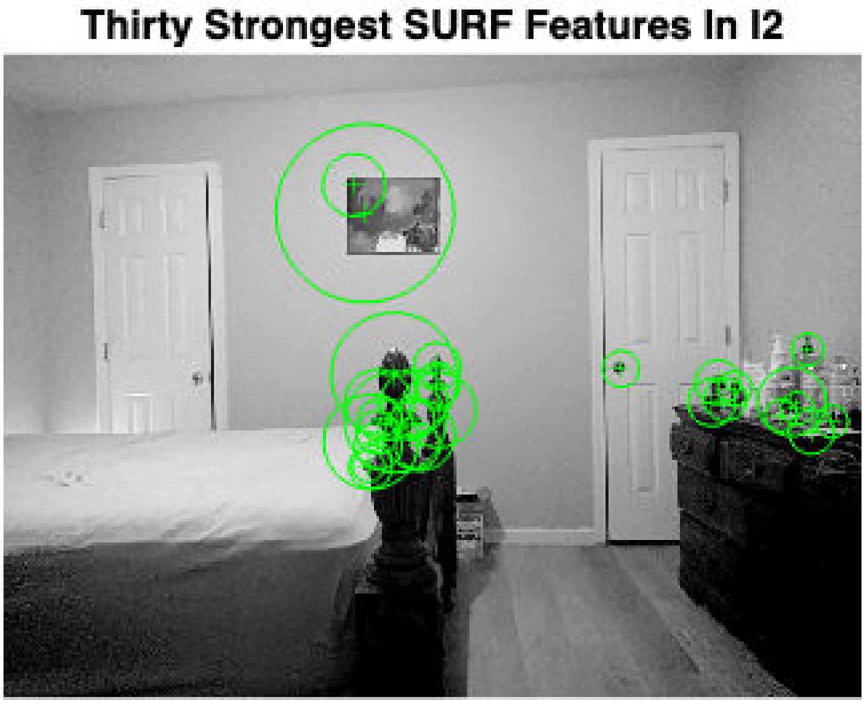


posite Image (Red - Left Image, Cyan - Right I

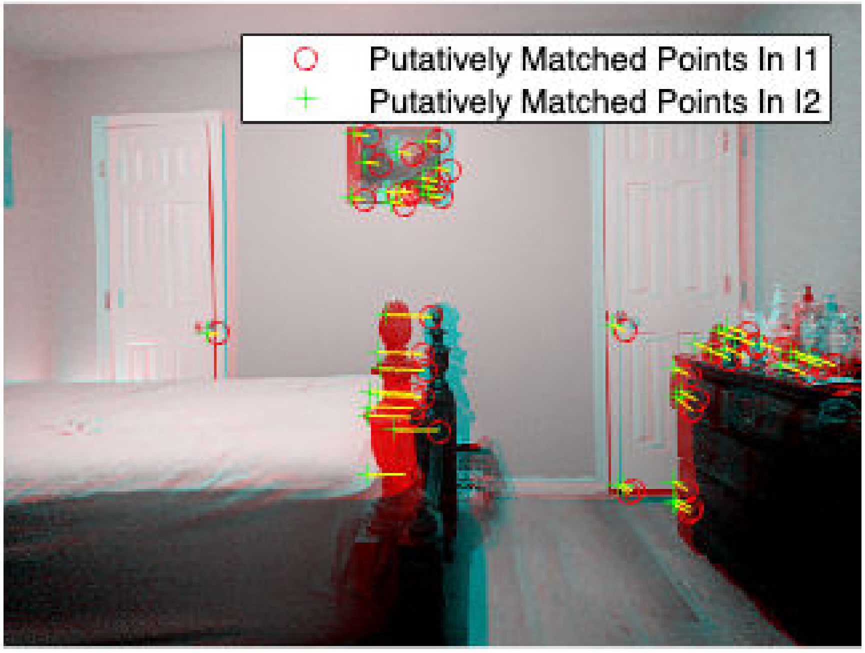
```
% Collect Interest Points from Each Image
blobs1 = detectSURFFeatures(I1gray,MetricThreshold=2000);
blobs2 = detectSURFFeatures(I2gray,MetricThreshold=2000);


% Visualize the location and scale of the thirty strongest SURF features in
I1 and I2.
figure
imshow(I1)
hold on
plot(selectStrongest(blobs1,30))
title("Thirty Strongest SURF Features In I1")
```



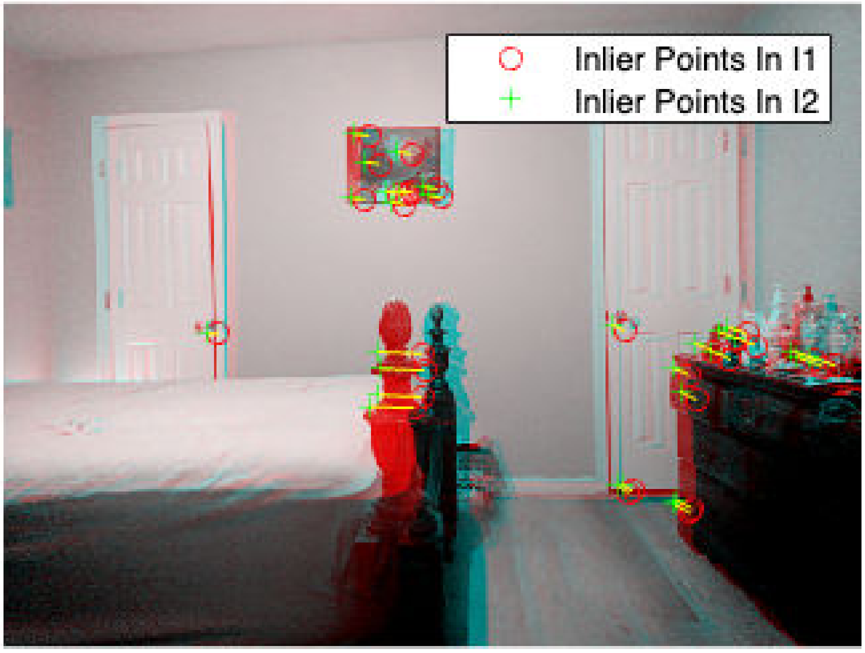
```
figure
imshow(I2)
hold on
plot(selectStrongest(blobs2,30))
title("Thirty Strongest SURF Features In I2")
```



```
% Find Putative Point Correspondences
[features1,validBlobs1] = extractFeatures(I1gray,blobs1);
[features2,validBlobs2] = extractFeatures(I2gray,blobs2);

% Use the sum of absolute differences (SAD) metric to determine indices of
matching features.
indexPairs = matchFeatures(features1,features2,Metric="SAD", ...
MatchThreshold=5);

% Retrieve locations of matched points for each image
matchedPoints1 = validBlobs1(indexPairs(:,1),:);
matchedPoints2 = validBlobs2(indexPairs(:,2),:);

% Show matching points on top of the composite image, which combines stereo
images.
figure
showMatchedFeatures(I1, I2, matchedPoints1, matchedPoints2)
legend("Putatively Matched Points In I1","Putatively Matched Points In I2")
```


○ Putatively Matched Points In I1
+ Putatively Matched Points In I2

```
% Remove Outliers Using Epipolar Constraint
[fMatrix, epipolarInliers, status] = estimateFundamentalMatrix(...
  matchedPoints1,matchedPoints2,Method="RANSAC", ...
  NumTrials=10000,DistanceThreshold=0.1,Confidence=99.99);

if status ~= 0
    error('Failed to estimate the fundamental matrix. Check the quality and quantity of matched points.');
elseif isEpipoleInImage(fMatrix, size(I1))
    error('The epipole is inside the left image. Check camera alignment or consider using image rectification.');
elseif isEpipoleInImage(fMatrix', size(I2))
    error('The epipole is inside the right image. Check camera alignment or consider using image rectification.');
end


inlierPoints1 = matchedPoints1(epipolarInliers, :);
inlierPoints2 = matchedPoints2(epipolarInliers, :);

figure
showMatchedFeatures(I1, I2, inlierPoints1, inlierPoints2)
legend("Inlier Points In I1","Inlier Points In I2")
```



```
% Rectify Images
[tform1, tform2] = estimateStereoRectification(fMatrix, ...
  inlierPoints1.Location,inlierPoints2.Location,size(I2));

% Rectify the stereo images, and display them as a stereo anaglyph
[I1Rect, I2Rect] = rectifyStereoImages(I1,I2,tform1,tform2);
figure
imshow(stereoAnaglyph(I1Rect,I2Rect))
title("Rectified Stereo Images (Red - Left Image, Cyan - Right Image)")
```

ectified Stereo Images (Red - Left Image, Cyan - Right Ima