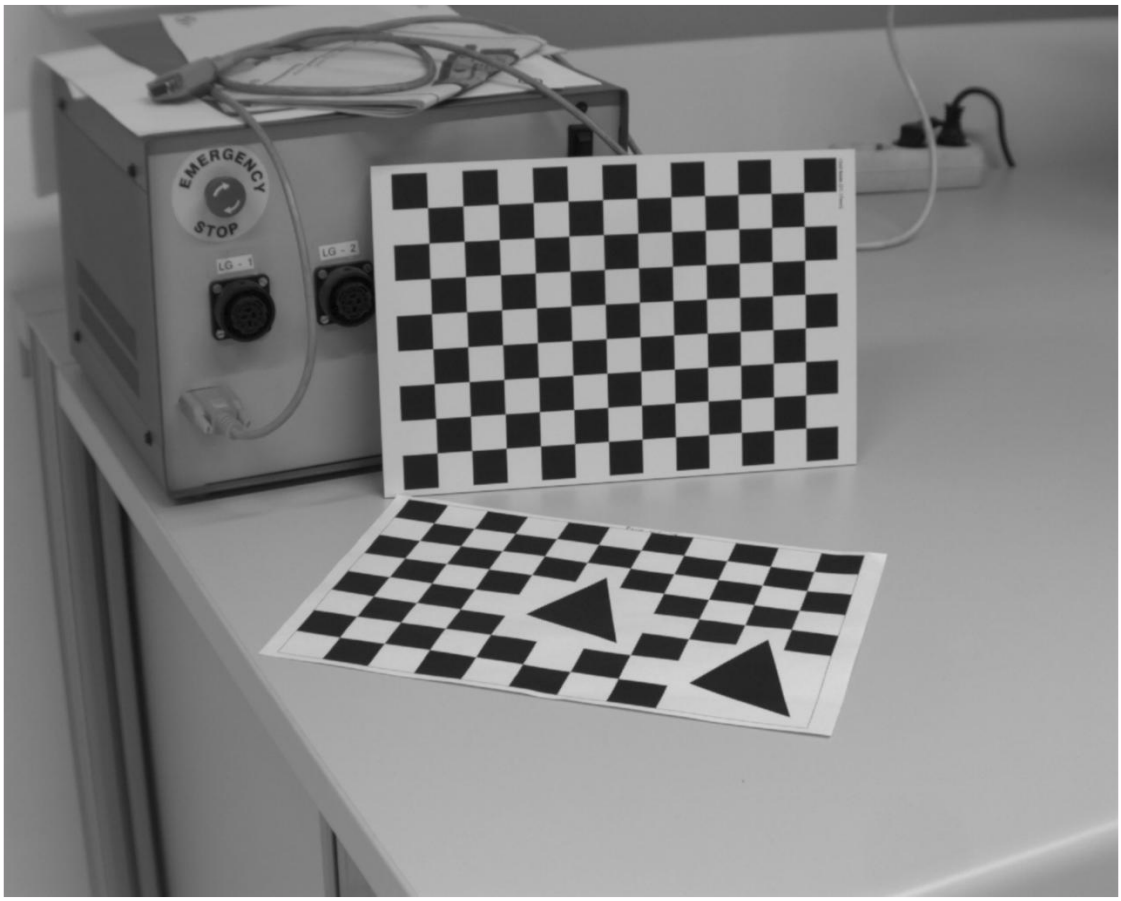
```
close all
%
% Calculate Fundamental Matrix
%
addpath('../Helpers/');
addpath('../Helpers/CalibToolBox');
USE_NORMALIZED_ALGO = true;

% load first image and extract corners
img_left = imread('img_left.jpg');
fprintf('Select the eight points!\n');
```

```
Select the eight points!
```

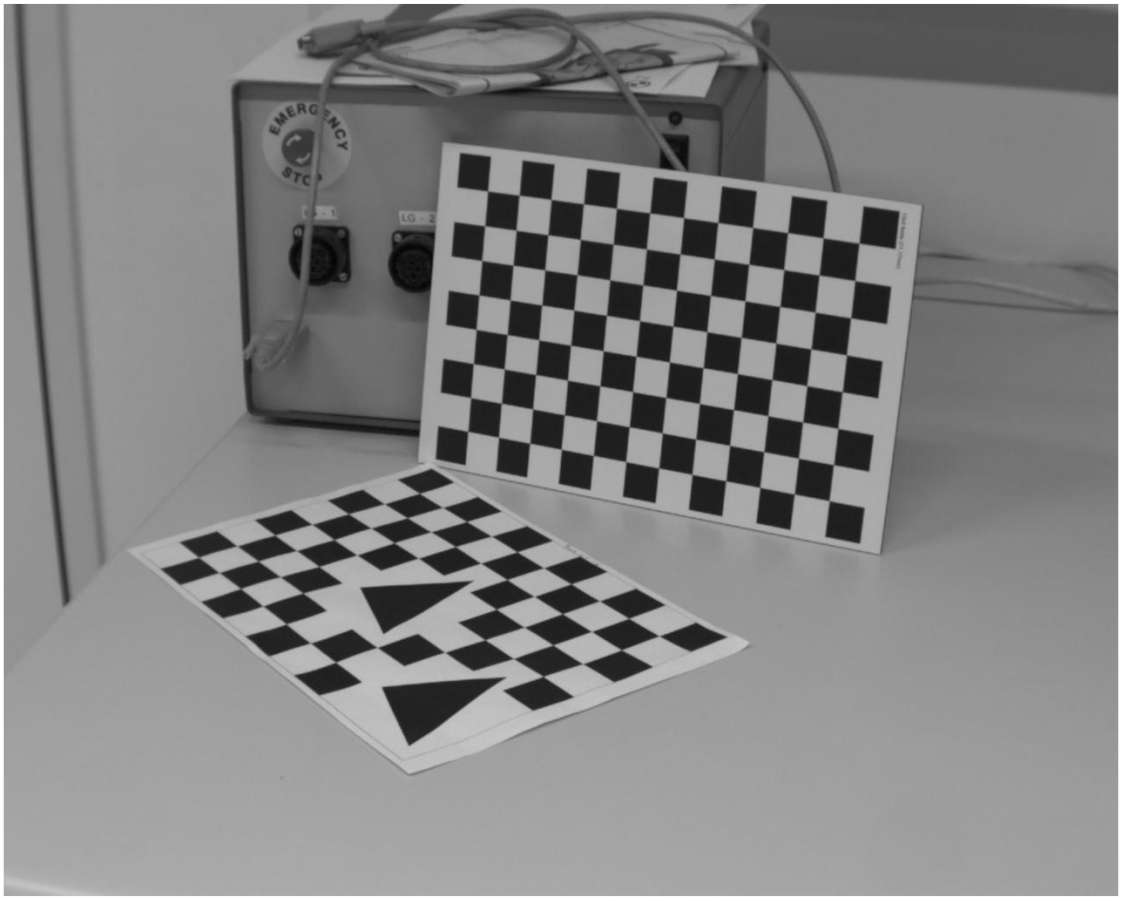
```
figure(1);
imshow(img_left);
```




```
%pts1=markCorners(img_left,8);
%
img_right = imread('img_right.jpg');
fprintf('Select the eight points!\n');
```

```
Select the eight points!
```

```
figure(2);
imshow(img_right);
```



```
%pts2=markCorners(img_right,8);

N = length(pts1);
% create arrays with homogenous coordinates:
pts1_hom = [pts1; ones(1, N)];
pts2_hom = [pts2; ones(1, N)];

% normalize the homogenous coordinates:
if USE_NORMALIZED_ALGO
    [pts1_hom, T1] = normalize_points(pts1_hom);
    [pts2_hom, T2] = normalize_points(pts2_hom);
end
```

TODO: 1) setup linear equation system:

----------$x_i'^T F x_i = 0$

==========

```
A = [pts2_hom(1,:) .* pts1_hom(1,:); pts2_hom(1,:) .* pts1_hom(2,:); pts2_hom(1,:) .* pts1_hom
     pts2_hom(2,:) .* pts1_hom(1,:); pts2_hom(2,:) .* pts1_hom(2,:); pts2_hom(2,:) .* pts1_hom
     pts2_hom(3,:) .* pts1_hom(1,:); pts2_hom(3,:) .* pts1_hom(2,:); pts2_hom(3,:) .* pts1_hom

A = A';

[~,~,V] = svd(A);
```

```
F = reshape(V(:,end),3,3)';
```

TODO: 2) impose rank 2 constraint:

---------- ... .. .
==========

```
[U,S,V] = svd(F);
sig = sort(S(:),'descend');

Ss = diag([sig(1:2)' 0]);
Fs = U*Ss*V';


if USE_NORMALIZED_ALGO
    Fs = T2'*Fs*T1;
end
```

TODO: 3) show stereo pair and plot the epipolar lines:

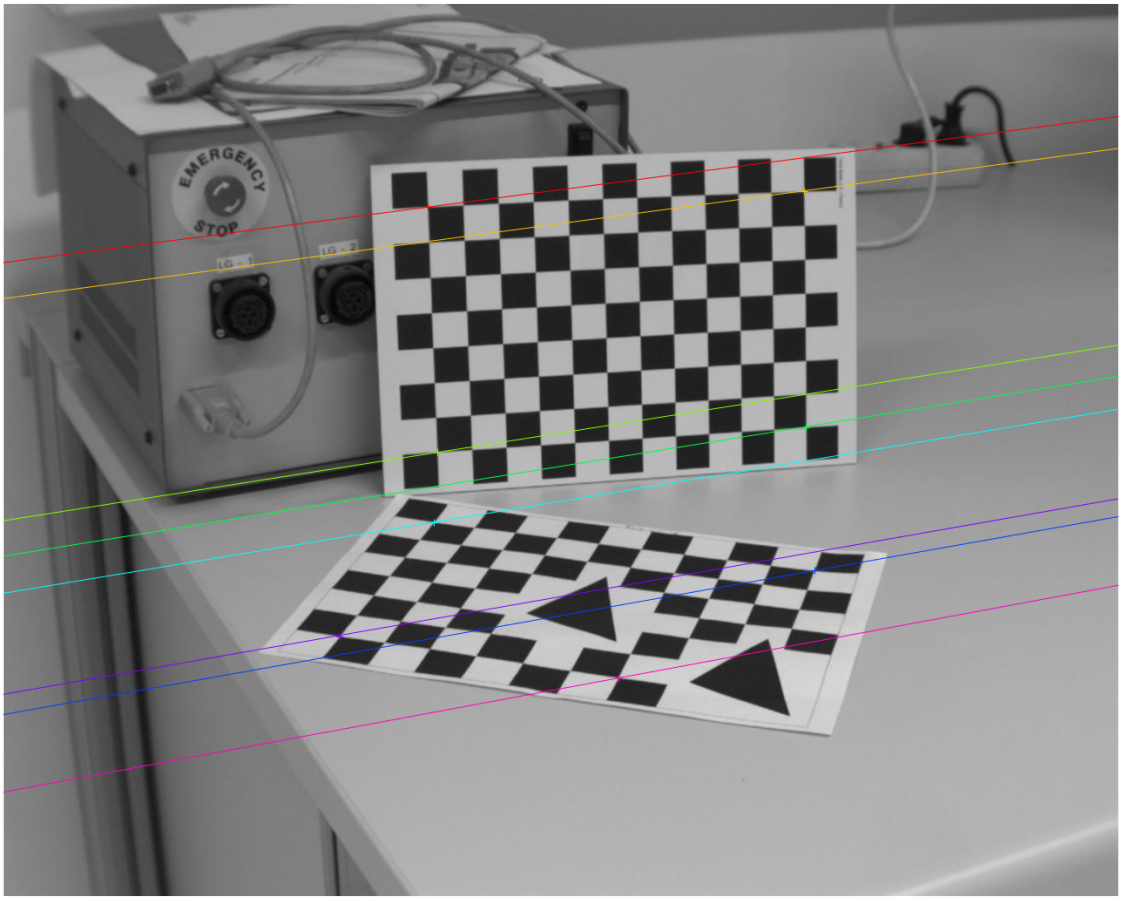
(complete and use the function 'drawEpipolarLine')

$$ l' = F x $$

$$ l^T x = 0 \leftarrow y = \frac{-l_3 - l_1 \cdot x}{l_2} $$

==========

```
drawEpipolarLine(Fs, pts1, pts2);
```


EMERGENCY
STOP