

## Contents

---

- [Conceptual representation of points](#)
- [Clustering](#)
- [Outlier rejection step](#)
- [Showing results](#)
- [Reference](#)

```
% This code just simply run the T-Linkage algorithm on the example data set
% "star5".
% Loading data: X contains data points, whereas G is the ground truth
% segmentation
load 'star5.mat'; N = size(X,2);
% Model specification: T-Linkage need to define a distance (distFun)
% between points and models.
% hpFun given cardmss points returns an estimate model, fit_model is
% a function for least square fitting.
% In this example we want to estimate lines so distFun is the euclidean
% distance between a point from a line in the plane and cardmss=2.
% Other possible models are 'line', 'circle',
% fundamental matrices ('fundamental') and 'subspace4' (look in 'model_spec' folder).
%

[distFun, hpFun, fit_model, cardmss] = set_model('line');
```

## Conceptual representation of points

---

```
%T-linkage starts, as Ransac with random sampling:
% Uniform sampling can be adopted
S = mssUniform(X, 5*N,cardmss);
% in order to reduce the number of hypotheses also a localized sampling can
% be used:
%
%         D = pdist(X','euclidean');  D = squareform(D);
%         S = mssNorm( X, D, 2*N, cardmss);
%

H = hpFun( X, S );
% generating a pool of putative hypotheses H.
% The residuals R between points and model
R = res( X, H, distFun );
% are used for representing points in a conceptual space.
% In particular a preference matrix P is built depicting by rows points
% preferences.
%

epsilon= 1.3e-1; %An inlier threshold value  epsilon has to be specified.
P  = prefMat( R, epsilon, 1 );
```

Exponential voting

## Clustering

---

```
%T-Linkage clustering follow a bottom up scheme in the preference space
```

```
C = tlnk(P);
```

```
% C is a vector of labels, points belonging to the same models share the  
% same label.
```

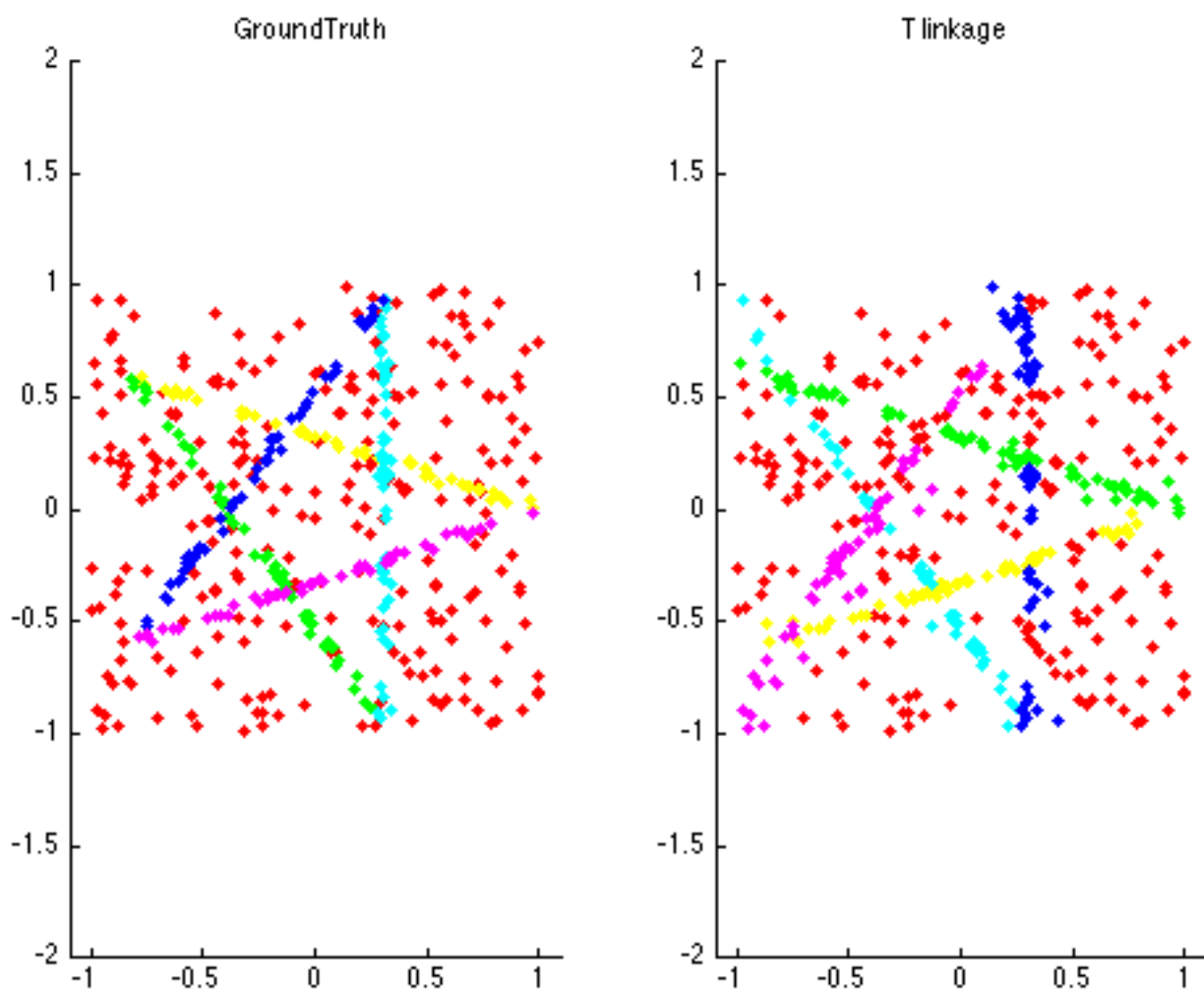
## Outlier rejection step

```
%T-Linkage fit a model to all the data points. Outlier can be found in  
%different ways (T-Linkage is agonostic about the outlier rejection strategy),  
%for example discarding too small cluster, or exploiting the randomness of  
%a model.
```

```
C = outlier_rejection_card( C, cardmss );  
% Outliers are labelled by '0'
```

## Showing results

```
figure  
subplot(1,2,1); gscatter(X(1,:),X(2,:),G); axis equal; title('GroundTruth'); legend off  
subplot(1,2,2); gscatter(X(1,:),X(2,:),C); axis equal; title('T linkage'); legend off
```



## Reference

When using the code in your research work, please cite the following paper: Luca Magri, Andrea Fusiello, T-Linkage: A Continuous Relaxation of J-Linkage for Multi-Model Fitting, CVPR, 2014.

For any comments, questions or suggestions about the code please contact [luca \(dot\) magri \(at\) unimi \(dot\) it](mailto:luca(dot)magri(at)unimi(dot)it)