EECS 442 Discussion

Arash Ushani

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Logistics

- HW2 is out, due 10/15
- Office Hours this week only Thursday 2-3 PM
- Projects coming up!

Some potentially useful MATLAB functions

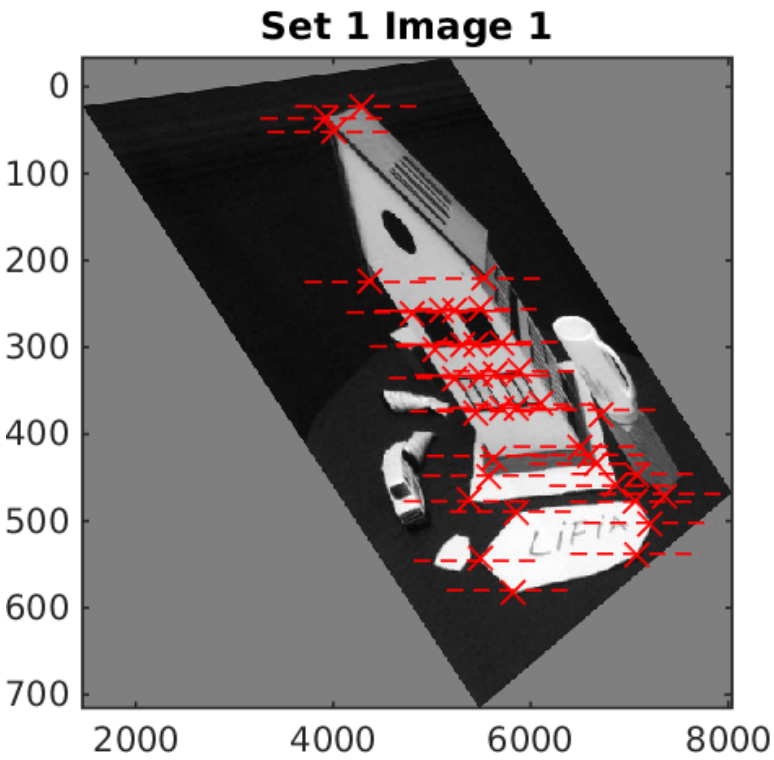
- `imread`
- `image`
- `imshow`
- `imagesc`
- `imtransform`

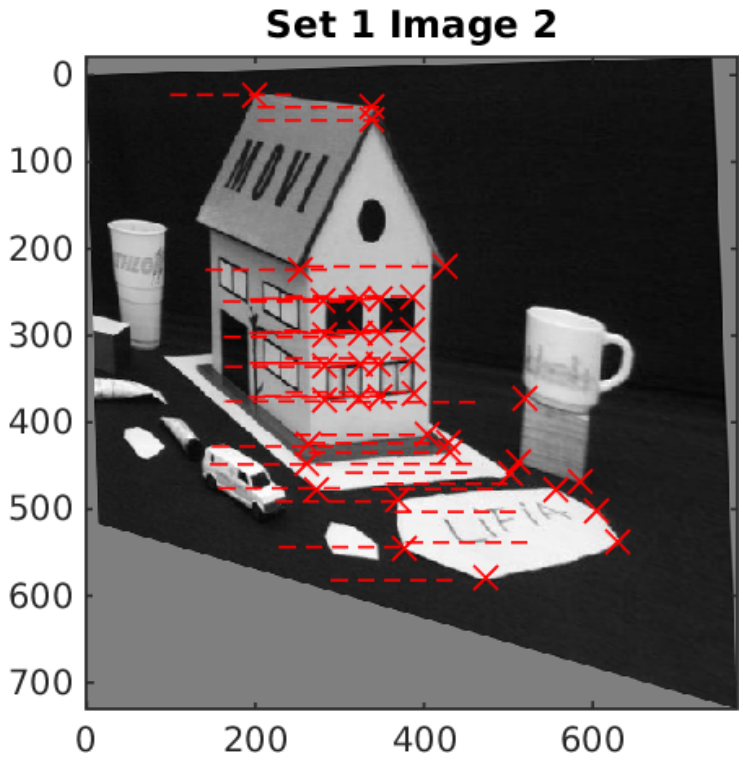
Epipolar Lines

Set 1 Image 1
Using Normalized Eight-Point Algorithm
(Rank 2 Enforced)
Average Pixel Error= 0.89

Set 1 Image 2
Using Normalized Eight-Point Algorithm
(Rank 2 Enforced)
Average Pixel Error= 0.83

Rectification





Projects

- Start thinking about projects!
- Project Proposals Due 10/22
  - Proposal Format
  - max 4 pages;
  - title and authors
  - sec 1. intro: problem you want to solve and why
  - sec 2. technical part: how do you propose to solve it?
  - sec 3. milestones (dates and sub-goals)
  - references

OpenCV

- `http://opencv.org/`
- Widely used computer vision library

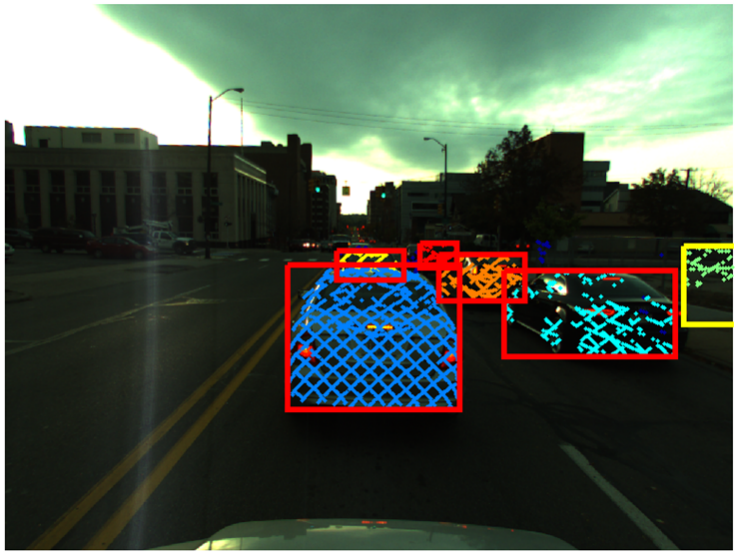
Datasets

- NCLT (`http://perl-data.engin.umich.edu/nclt/`)
- KITTI (`http://www.cvlibs.net/datasets/kitti/`)
- Many more, or you can collect your own

NCLT sample images

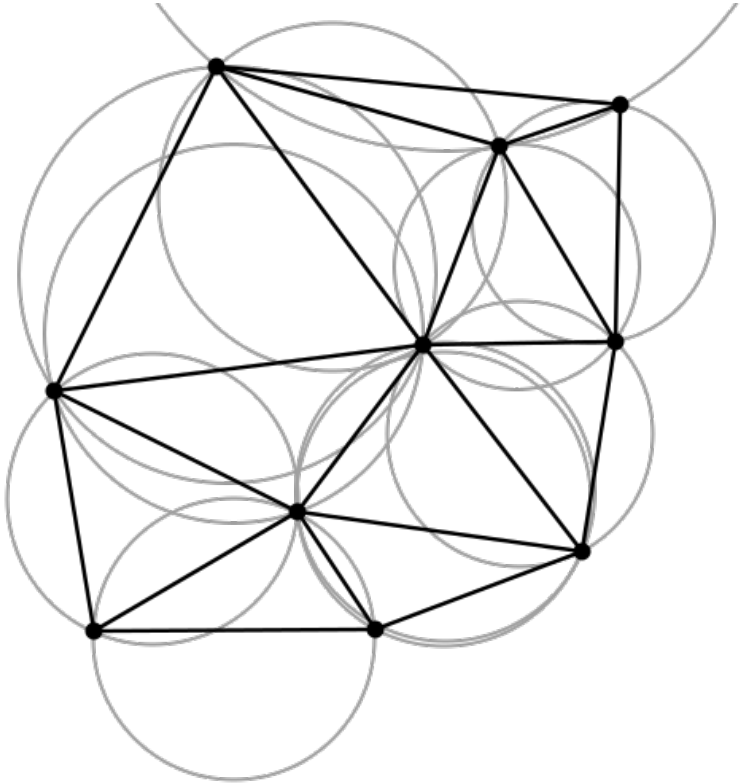
Traffic Lights

- Turn signal and stop light detection aided by LIDAR point clouds



Delaunay Triangulation

- Reimplement Delaunay Triangulation



Delaunay Triangulation (from wikipedia)

Semantic Structure from Motion

- Combine multi-image object detection and structure from motion to increase the accuracy of both
- Structure from motion gives an estimation of whether the same object detected in different images are belongs to a same 3D region
- Object detection and correspondences can be used similar to point correspondence in structure from motion, which gives more evidence to structure from motion

Ferns: Feature Tracking

- M. Ozuysal, M. Calonder, V. Lepetit and P. Fua (Fast Keypoint Recognition using Random Ferns) March 2010.
- Classification for faster feature point matching

Ferns: Feature Tracking

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- Classification for faster feature point matching
- Or... pick your own paper!