REU Presentation:

Week 4

Jacqueline Nelson

This Week's Progress

- Maiden Voyage of the sub
- Researched SIFT (Scale Invariant Feature Transform)
  - David Lowe - *Distinctive Image Features from Scale-Invariant Keypoints*
- Researched SURF (Speeded Up Robust Features)
  - Herbert Bay, Andreas Ess, Tinne Tuytelaars and Luc Van Gools - *Speeded Up Robust Features*
  - Christopher Evans - *Notes on OpenSURF Library*

SIFT vs. SURF

SIFT pros:

- Well established
- Widely used
- Reliable results

SURF pros:

- Has repeatability results similar to SIFT
- Faster
- Less computations

SIFT cons:

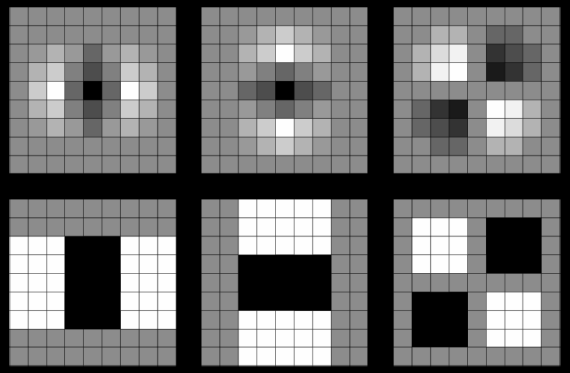
- Lengthy computations for best results

SURF cons:

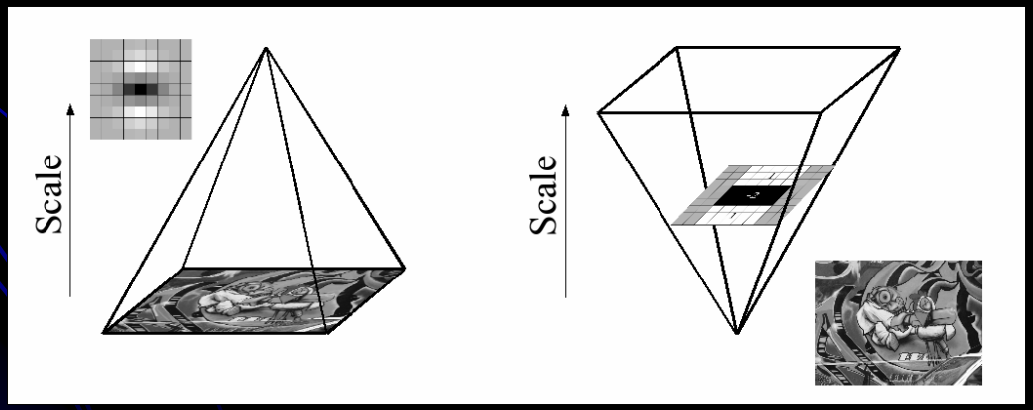
- No one here is very familiar with it

Why SURF Is Faster

- Performs calculations on the “integral image”
- Uses box filters, instead of derivative of Gaussian



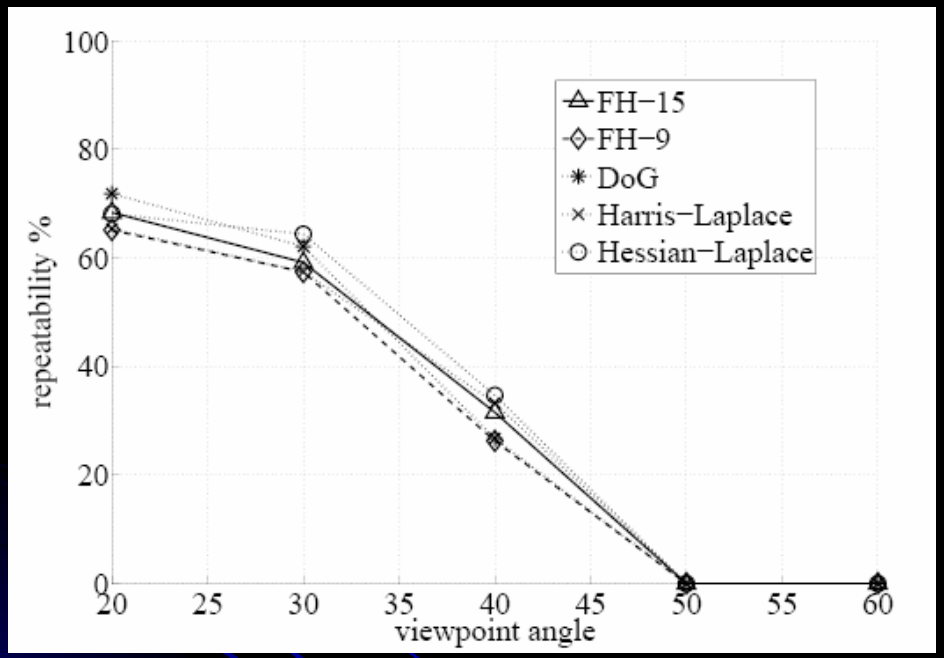
- Scale space is created differently than in SIFT:



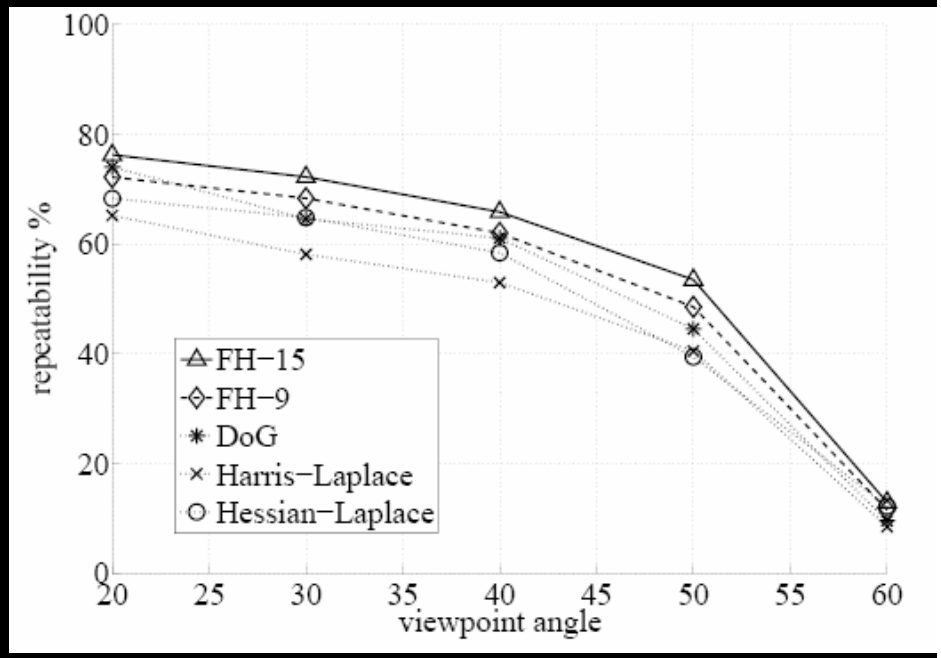
(Figures from Bay)

Bay's Results

Graffiti



Wall



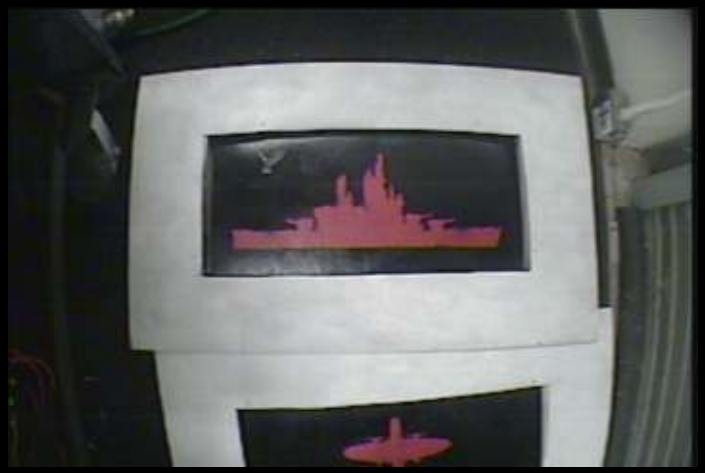
Repeatability scores for the Graffiti (left) and Wall (right) datasets with viewpoint changes.

(Figures from Bay)

The Goal

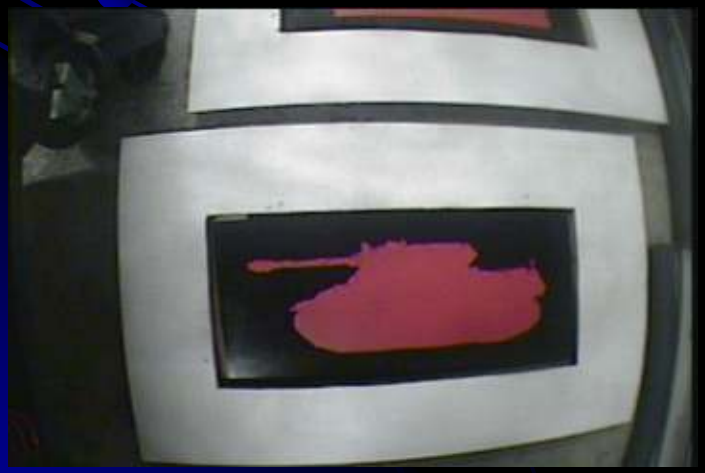
- To implement SURF to distinguish the following:

Battleship



Airplane

Tank



Factory