# Part 1 Automated Pairs

Harris response design parameters:

* Gaussian windowing function with
  + Higher than project 2 sigma (1) to account for background blur; testing shows acceptable results with value
  + Window size tied to
* Non-max suppression used modified method, not NONMAX\_THRESH and HYSTERESIS\_THRESH from class
  + Just largest value within local neighborhood, zeroing others
  + Neighborhood size same as Gaussian window size (to keep testing to same block being blurred by Gaussian)
  + Modified b/c better testing from using point correspondences spatially distant + other regions of image (see Figure X)
  + Harris free parameter, empirical .04 - .06
  + Higher = more precision but less recall
  + Increased to reduce redundant points around same feature
* Set detection to top 100 responses
  + Cast:
  + Image:

Matching design parameters:

* Match features A to features B
* Applied heuristic assuming that “good” correspondences should have similar displacements (i.e. disparities)
  + Similar to approach in Project 2; see Figure X
  + Different though because doesn’t aggregate different image patch sizes for matching – want to try ONE patch size and see if heuristic + RANSAC sufficient to remove outliers
  + Heuristic removes outliers in run with single patch size, rather than over aggregate
* Image patch size set to 10% of image dimensions
  + Too small = problems with different regions appearing similar
  + Too high = problems with offset + same feature across images may include unique parts of image, lowering score
  + Testing to get chosen value
  + Cast:
  + Image:
* Keep pairs with an NCC of at least 0.7
  + From checking scores of correct pairs in initial test
  + Paired with patch size; larger patch size = greater chance of lower NCC for correct pair -> should use lower threshold; smaller size = greater chance NCC higher for correct pair but also for similar patch appearing elsewhere -> should use higher threshold
  + Cast: 53 pairs
  + Image: 42 pairs
* Heuristic: toss out repeat matches (e.g. matches where B feature already matched) with lower scores

Correspondences for Cast stereo pair:

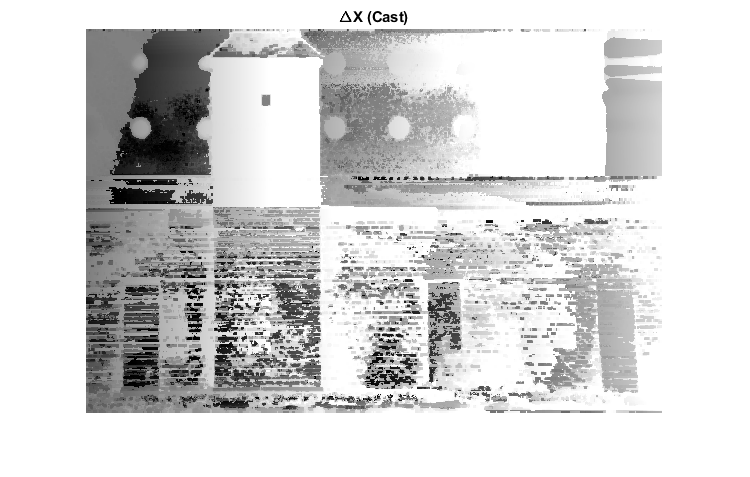
A screenshot of a computer

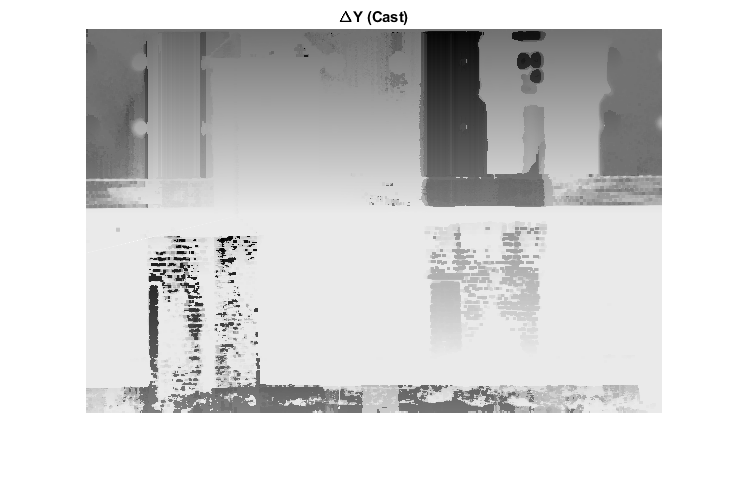
Description automatically generated with medium confidence

Application

Description automatically generated with medium confidence

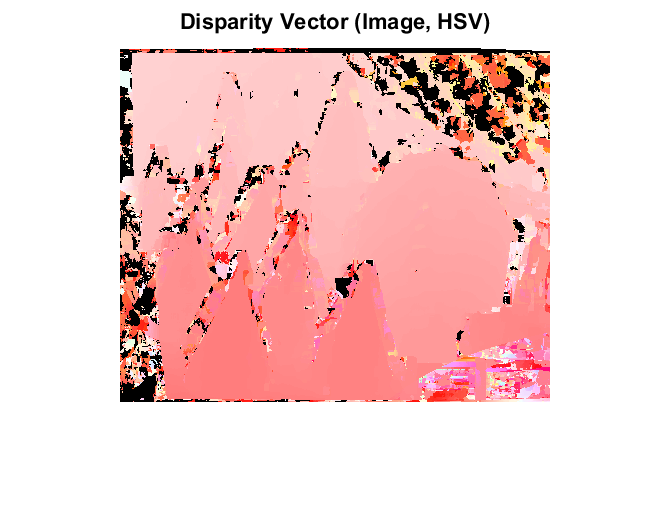
Diff intensity maps





A picture containing text

Description automatically generated

A picture containing text, picture frame

Description automatically generatedA picture containing shape

Description automatically generated

Map

Description automatically generated

Diagram

Description automatically generated with medium confidenceText

Description automatically generated with medium confidence