

INTERACTIVE OBJECT TRACKING

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PROBLEM / MOTIVATION

- ▶ Object tracking in webcam feed
 - ▶ Using OpenCV algorithms
- ▶ Go Baby Go (<https://health.oregonstate.edu/gobabygo>)
 - ▶ Adapts ride-on toy cars for disabled children
- ▶ Select object in webcam feed to track and move towards

RELATED RESEARCH

- ▶ Distinctive Image Features from Scale-Invariant Keypoints
 - ▶ Finding best matches from SIFT / SURF
- ▶ Used OpenCV functions
 - ▶ Template Matching
 - ▶ 2d feature detection, SIFT and SURF
- ▶ Mouse Events detector

METHODS

- ▶ Select object by drawing rectangle
- ▶ Variable ratio to accept more or less features
- ▶ Selects point from tracking to represent all points
 - ▶ Decided based on center of image where the object is
 - ▶ Move left, move right, no move

EVALUATION

- ▶ Tested SIFT / SURF at five difference ratios
 - ▶ .2, .4, .6, .8
- ▶ Used Clark coaster for testing
- ▶ Same location in clean frame
- ▶ Used best ratio to test variable scale
- ▶ Template Matching
 - ▶ Tested, close and far

RESULTS

SIFT METHOD

.2



.6



.4



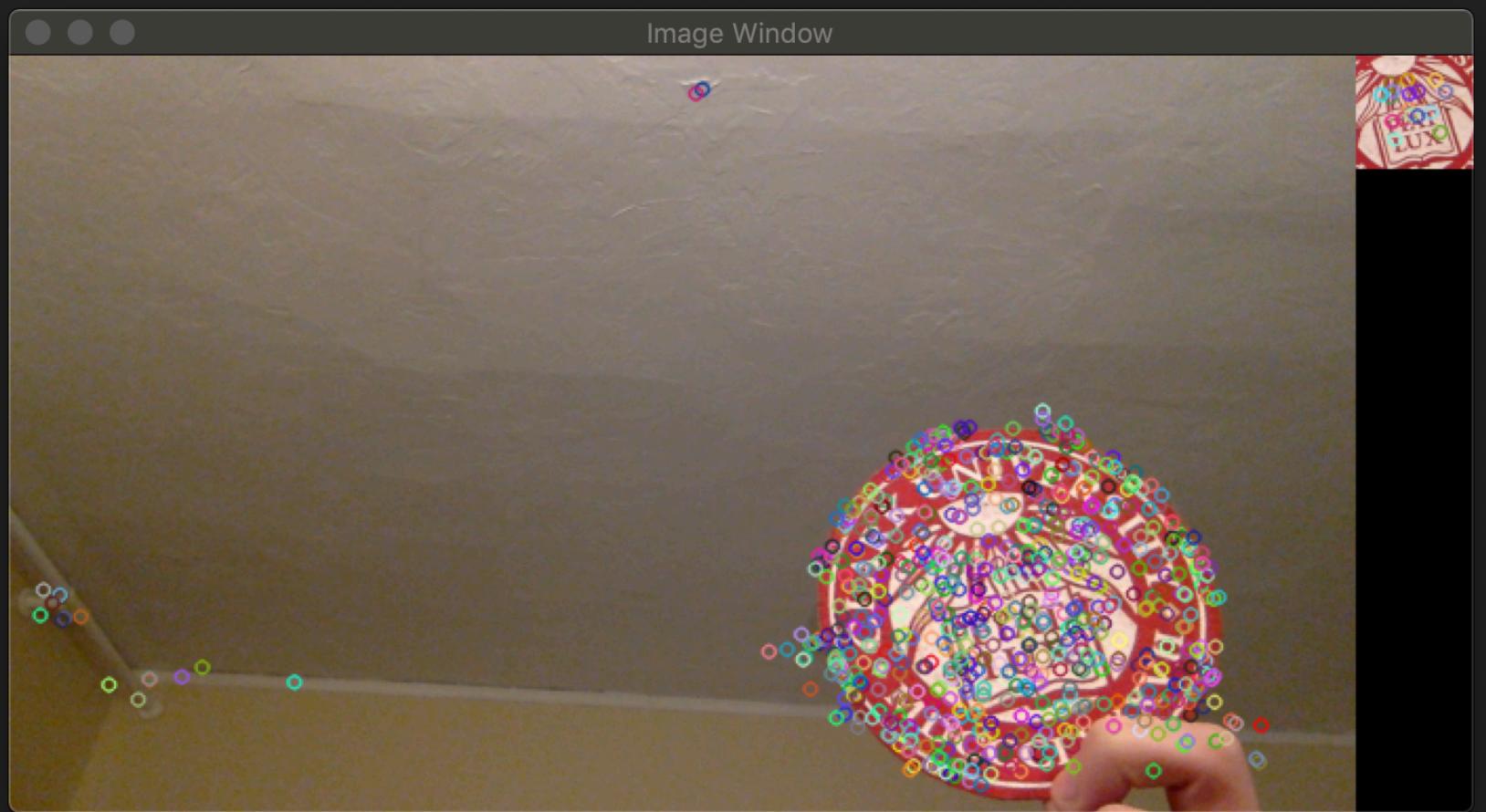
.8



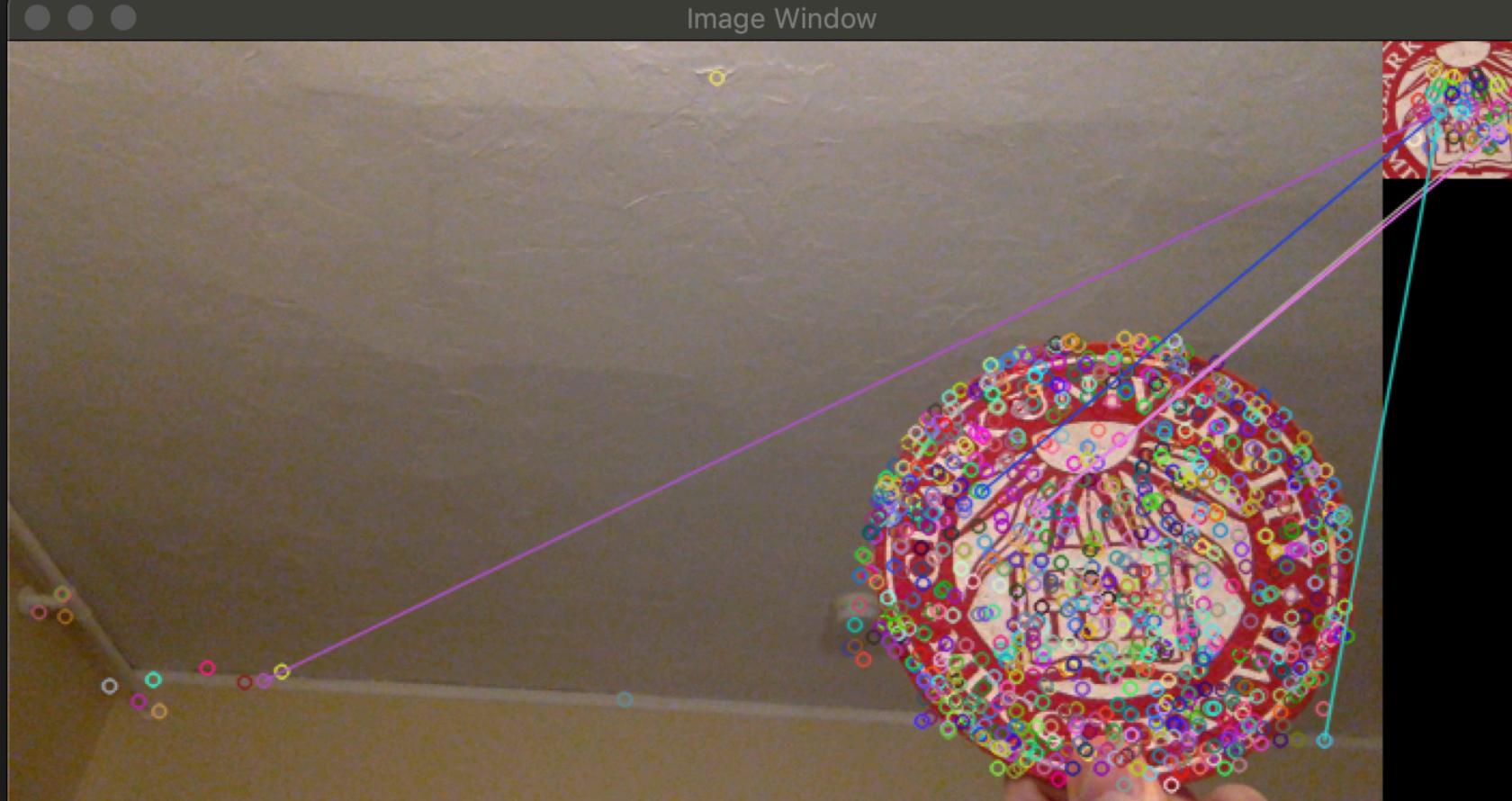
RESULTS

SURF METHOD

.2



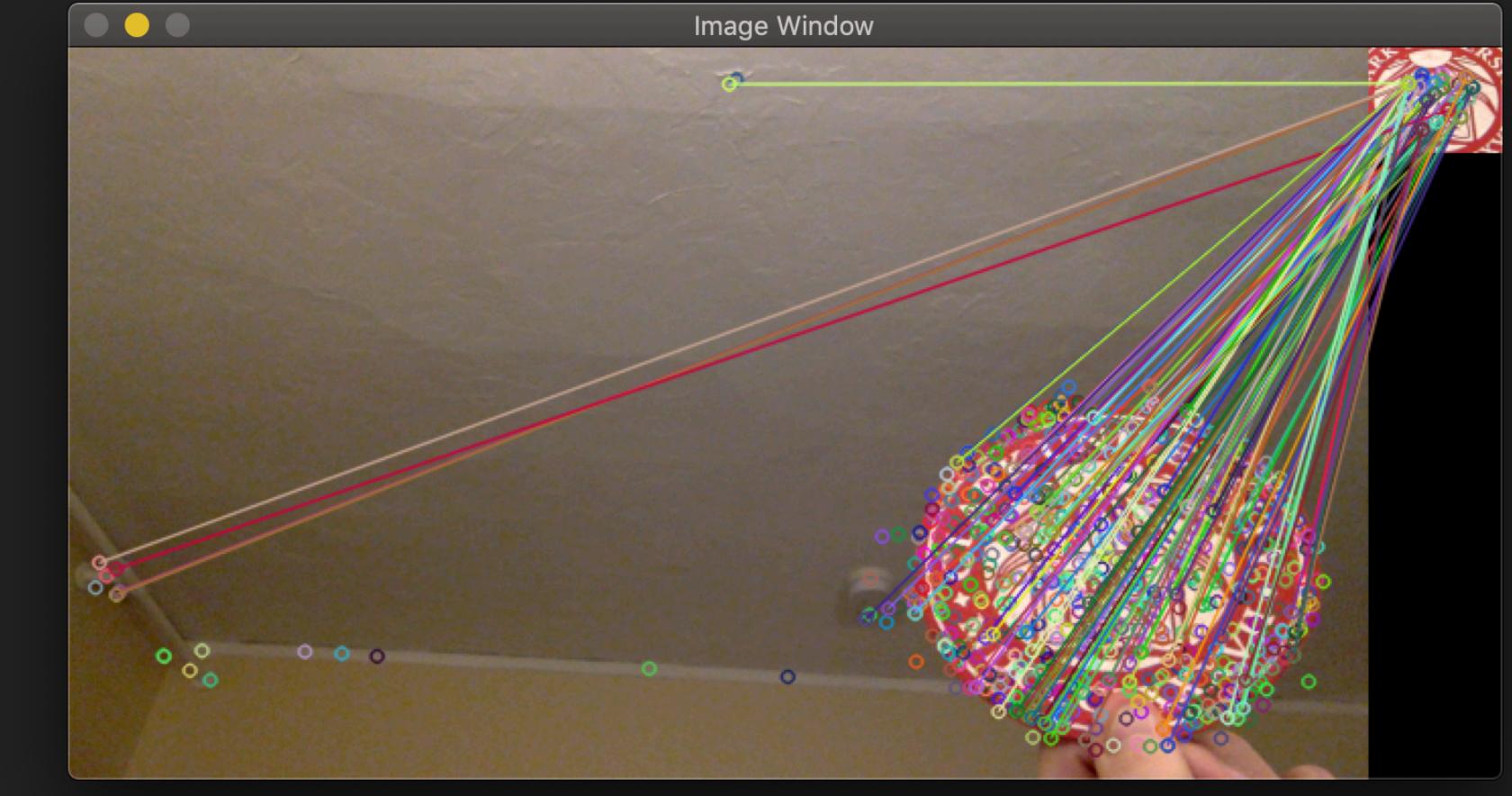
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.4



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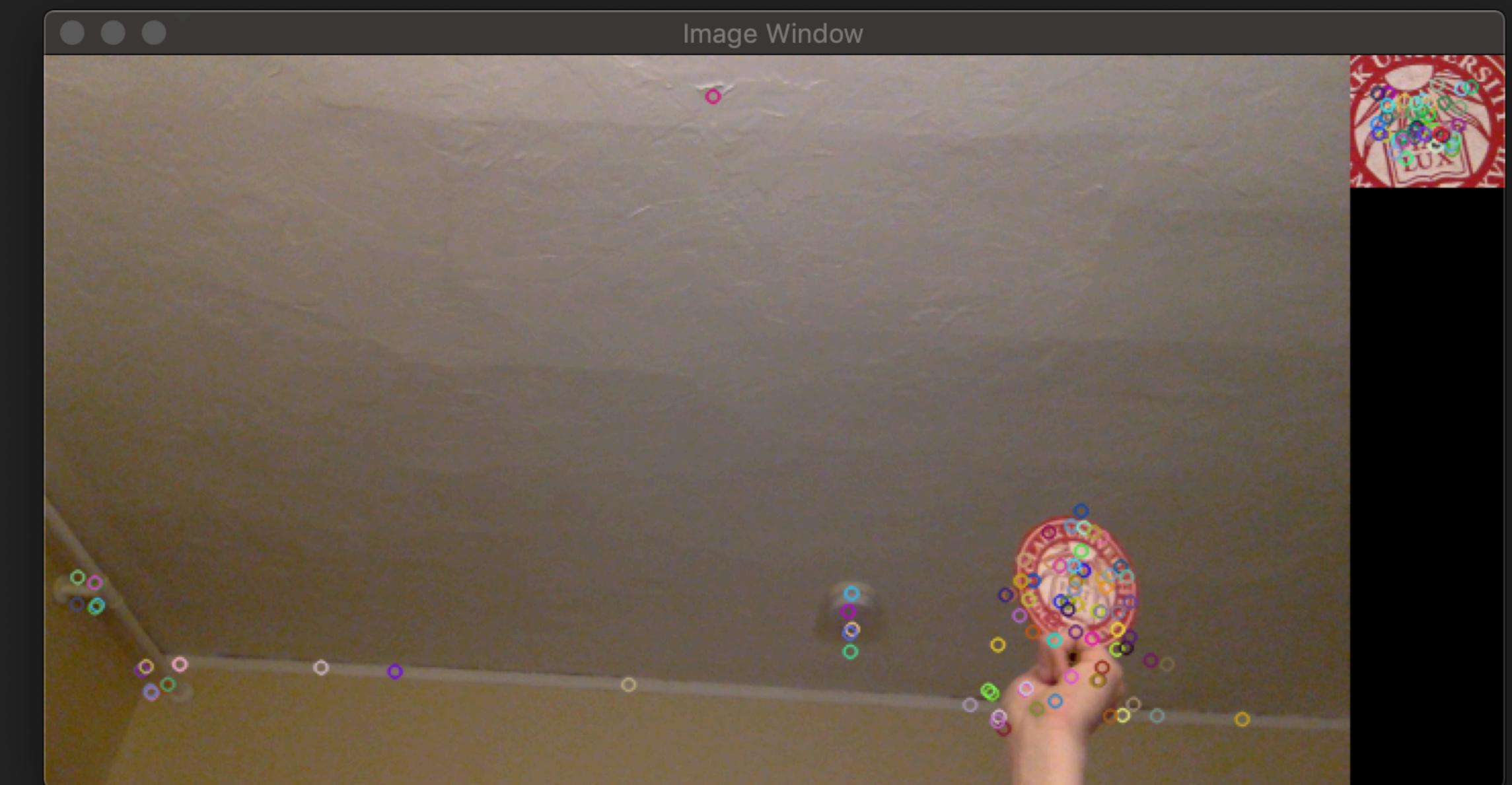
RESULTS

SIFT VS SURF FAR

SIFT



SURF



RESULTS

TEMPLATE MATCHING METHOD

Close



Far



CONCLUSION

DISCUSSION

/

- ▶ Represented openCV object tracking well,
- ▶ More optimization to be done
- ▶ Identify scale changes
- ▶ SURF best
- ▶ Template matching not good
 - ▶ Works a bit at distance
- ▶ Tracked better with moving object