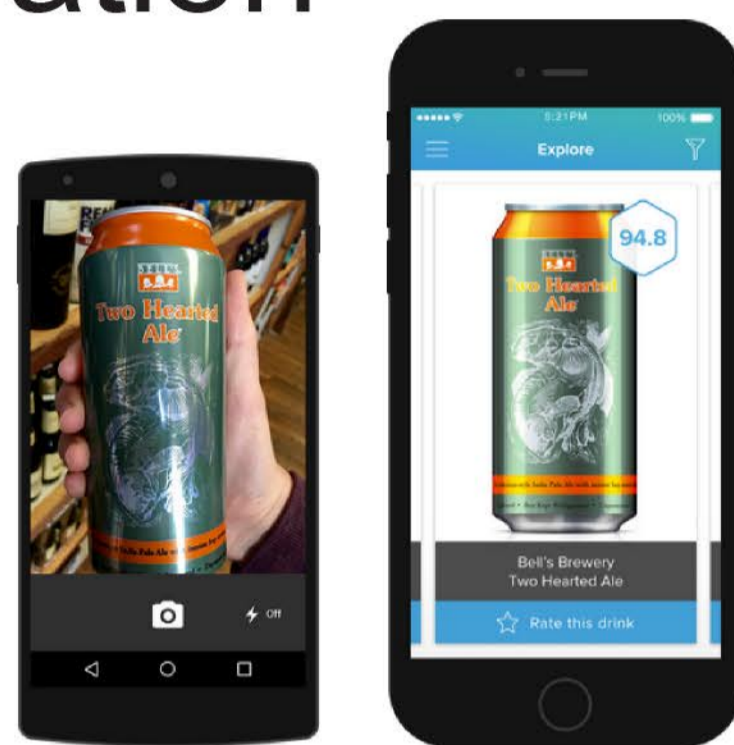# Beer Label Classification for Mobile Applications

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## Motivation

Develop image processing algorithm to identify beer labels for mobile applications

Test robustness of algorithm against common mobile camera issues

www.nextglass.co

## Dataset

- 100 clean beer labels and example test photographs collected from Google Images (one test image for each label in database). Separate dataset of 30 Sam Adams labels used to test sensitivity to similar labels.
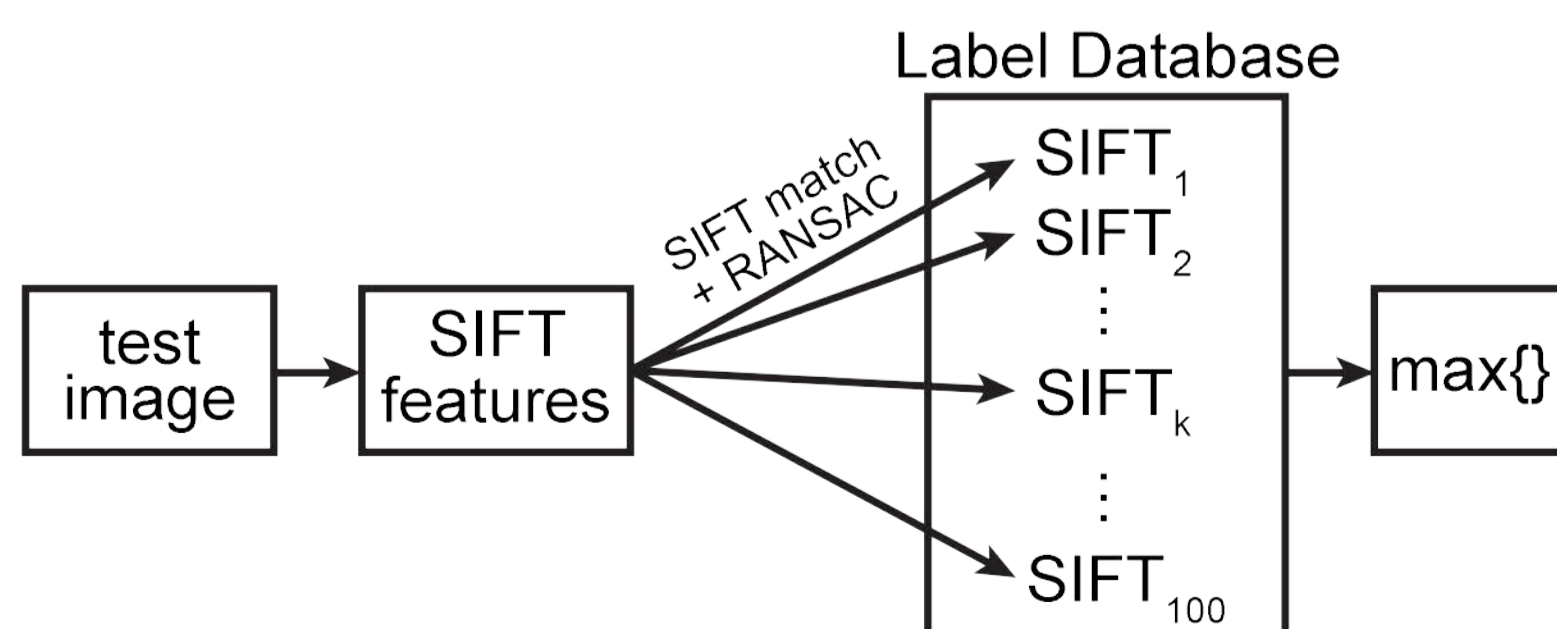
- Test images taken 6-12 inches from bottle

- Test images cropped to 4:3 ratio and downsampled to 400 x 300 matrix size for computational efficiency

- Motion simulated with `fpsecial` motion filter

- Performance evaluated as a function of distance for 5 labels using raw (non-downsampled) photos taken with iPhone 5 (2448 x 3264 px)
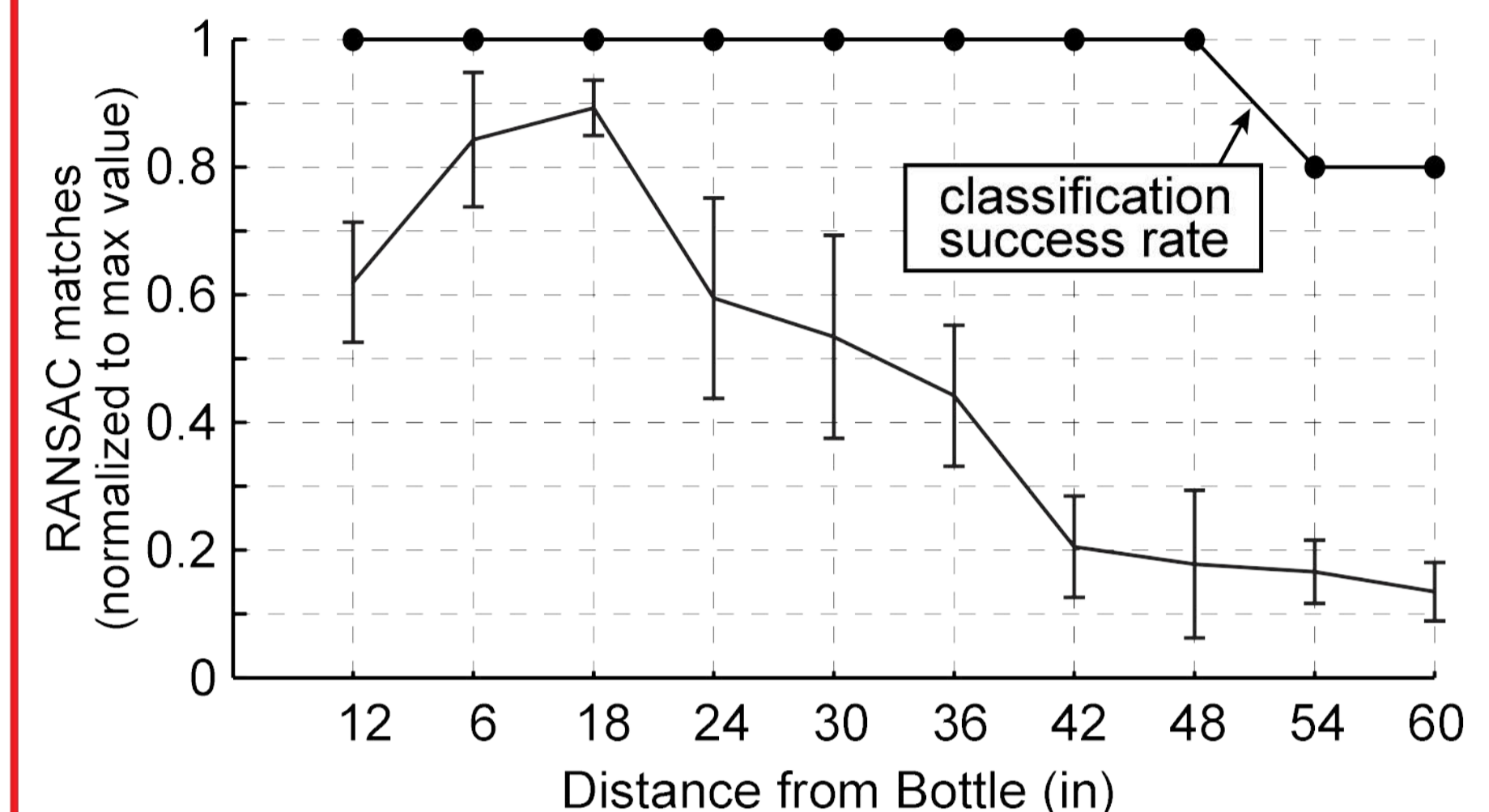
## Algorithm

D. G. Lowe, "Object recognition from local scale-invariant features," in Computer vision, 1999. The proceedings of the seventh IEEE international conference on, 1999, pp. 1150-1157.
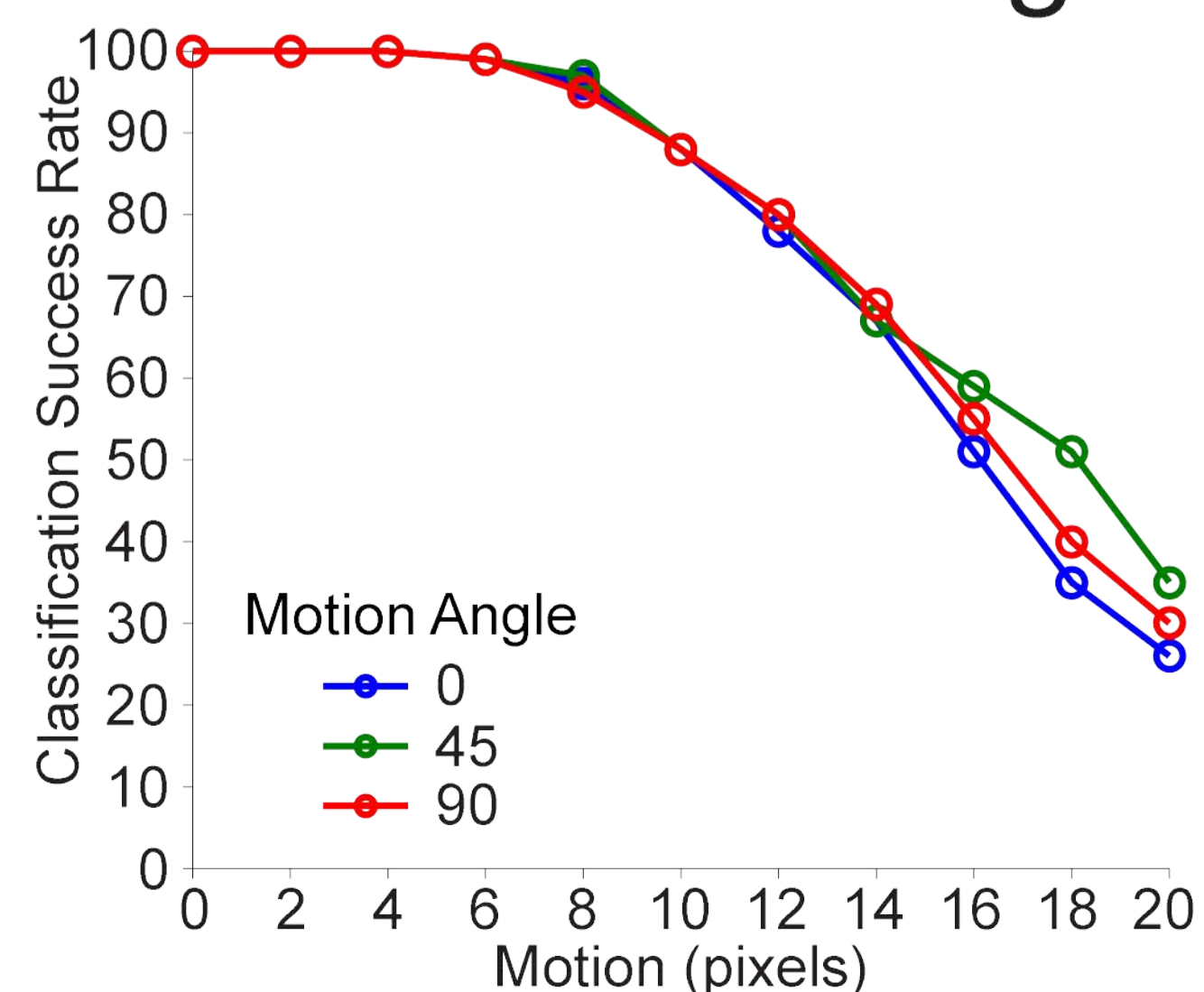
## Classification Results

- 100% accuracy was achieved for the 100 test image dataset
- Average query takes ~11 s (grows linearly with database size)
- 29/30 Sam Adams test images correctly labelled, demonstrating high sensitivity

## Robust against camera motion

Motion Angle
- 0
- 45
- 90

20 pixel motion, 45 degrees

## Robust against camera distance

classification success rate

## Future Work

Perform color histogram matching to increase sensitivity for beers from the same brewery

Expand label database to ~1000 images and implement vocabulary tree to reduce overhead.

Implement algorithm on a mobile device for real time processing from a camera input.