openAR

OpenCV based Augmented Reality

Introduction

Computer Vision for HCI

Improved extraction of data from real world unlike traditional codes

- Real-time implementation
- Execution on streaming and still image
- Deterministic approach
- Implementation in C/C++

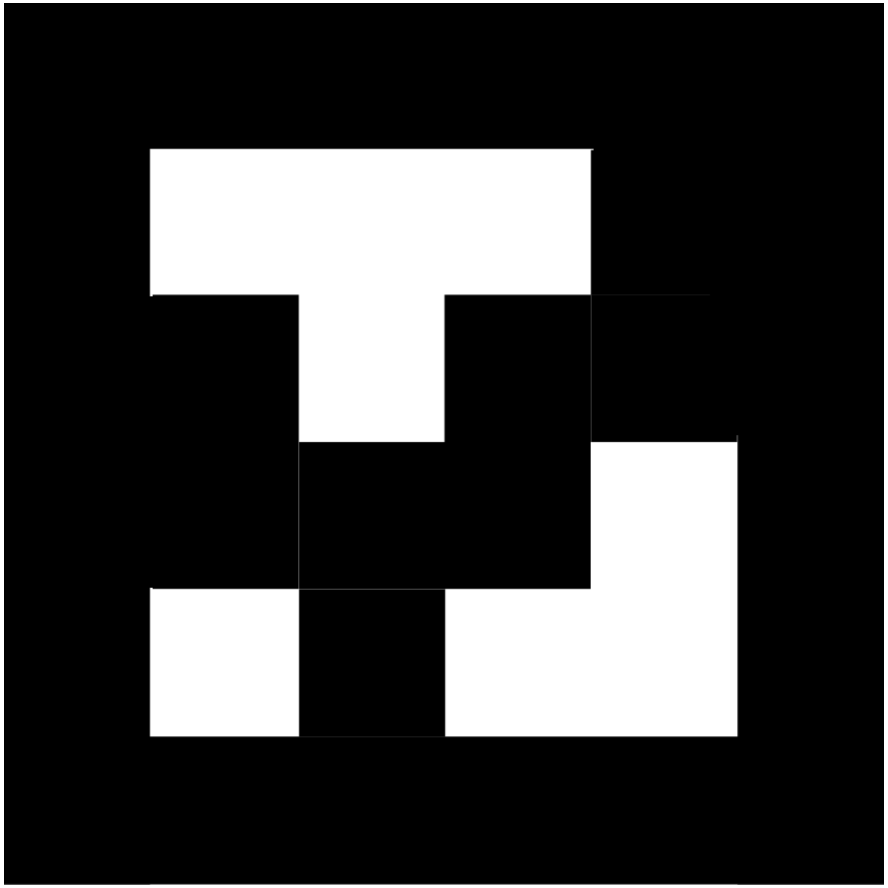
2D markers and recognition

Two Dimensional bit pattern is used as fiduciary marker.

Bit array marker corresponds to a unique Identification number.

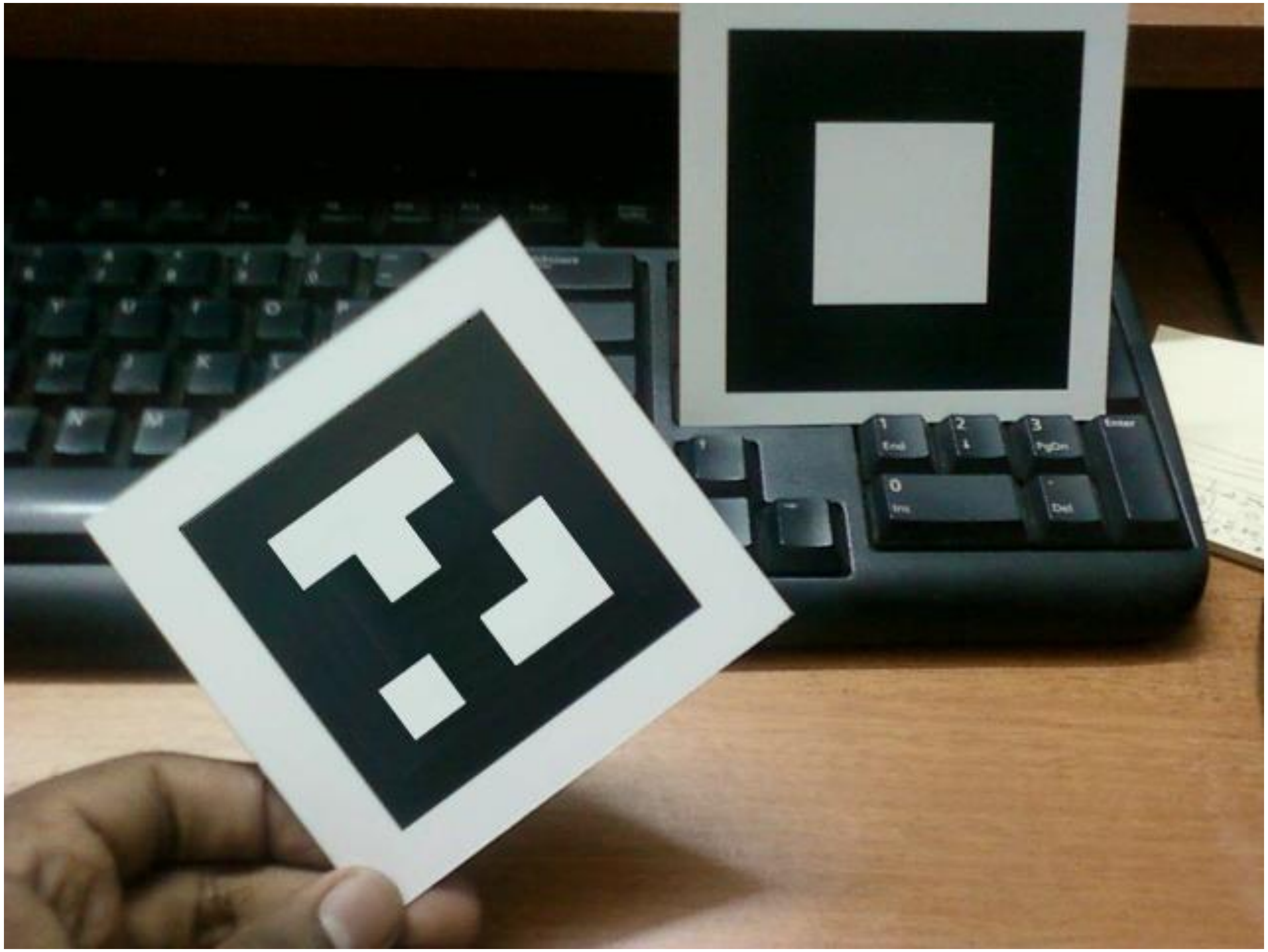
Improved detection with addition of Error correcting bits.

Sample 16 bit Marker

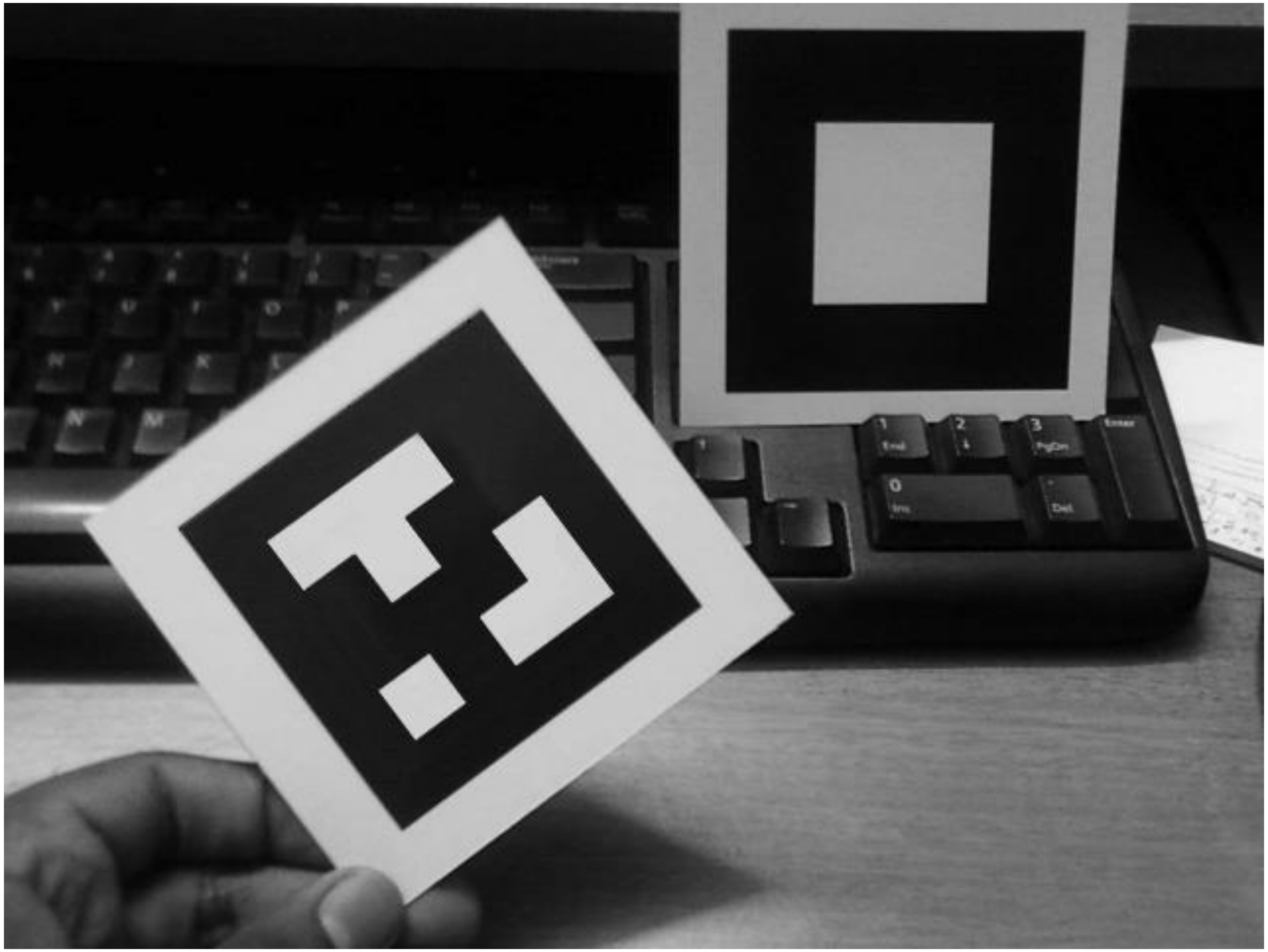


Implementation

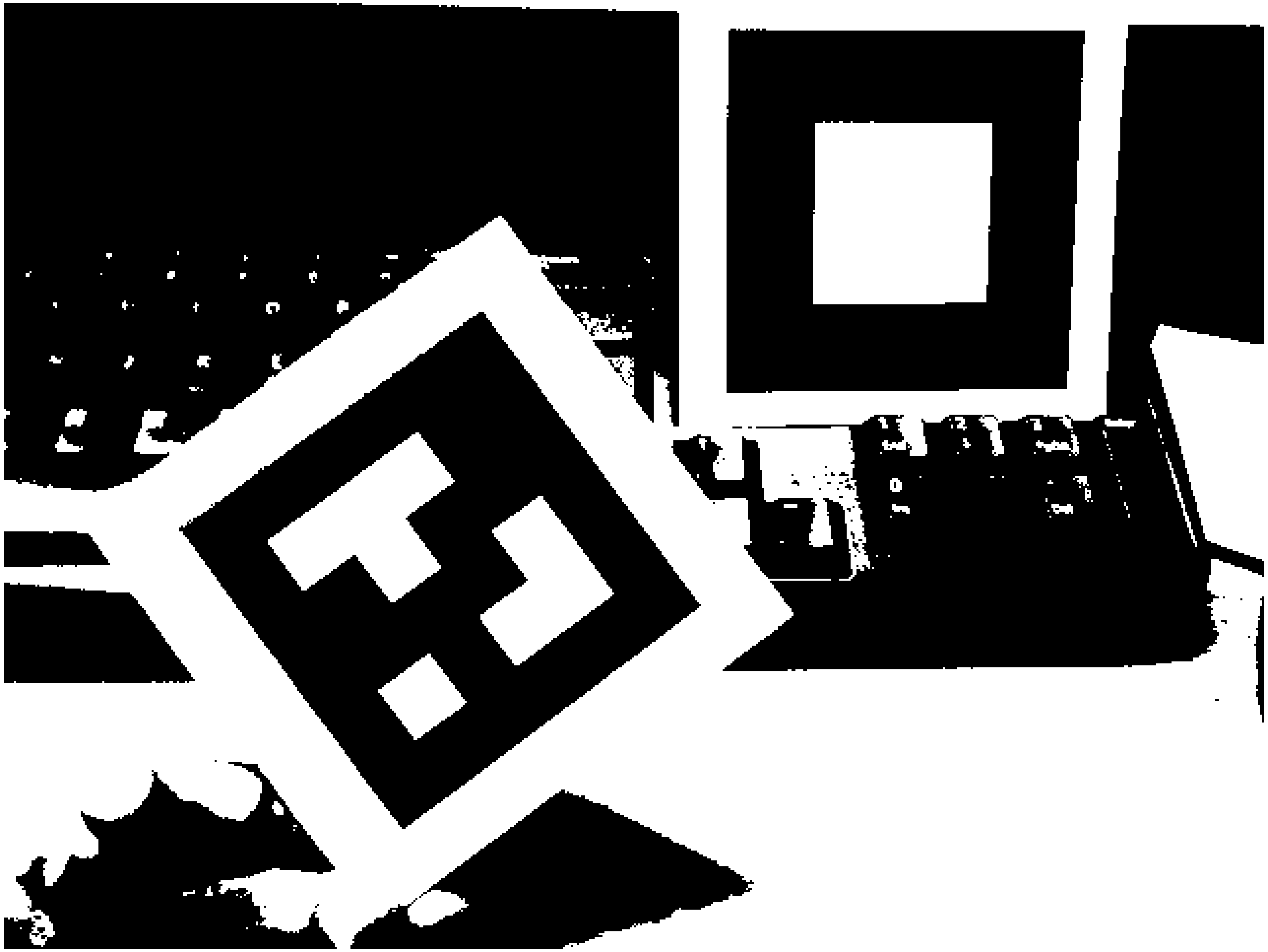
Image Capture



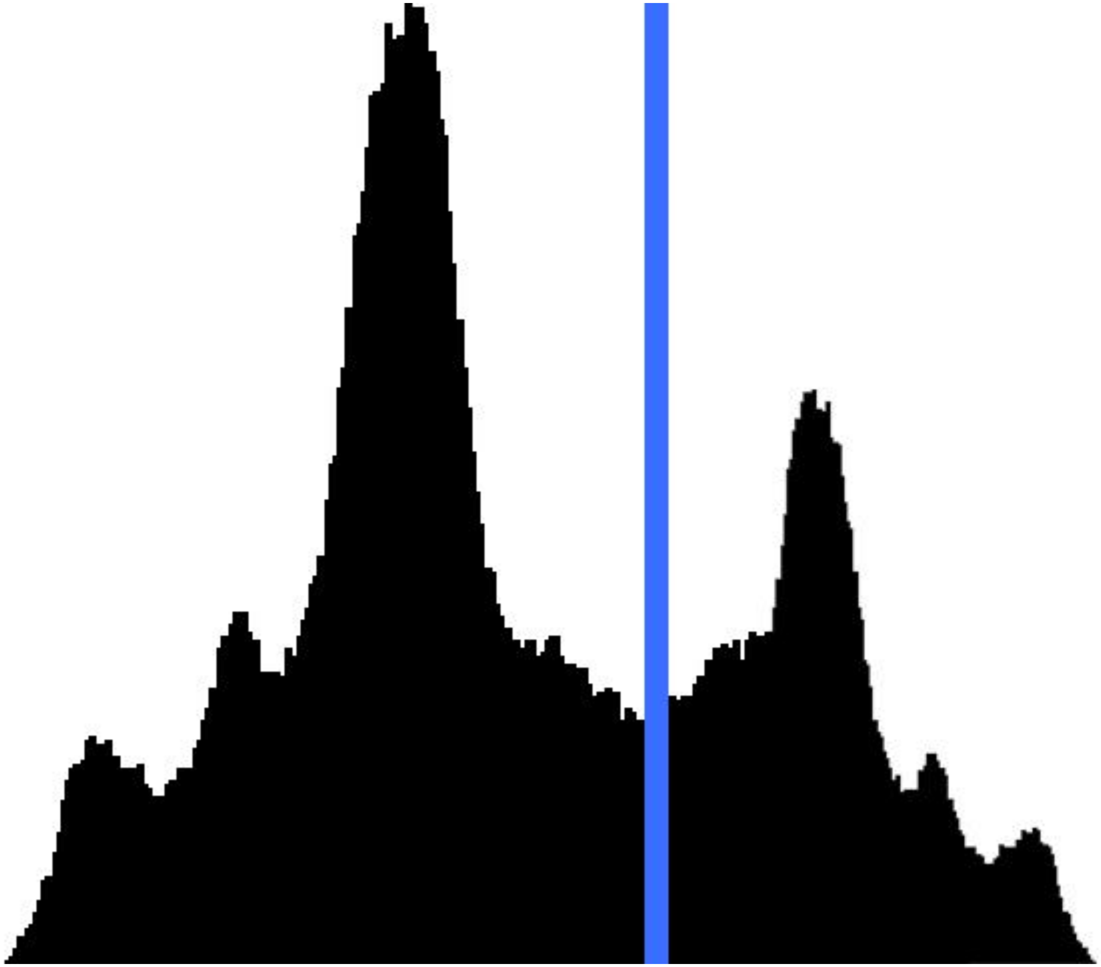
Grayscale conversion



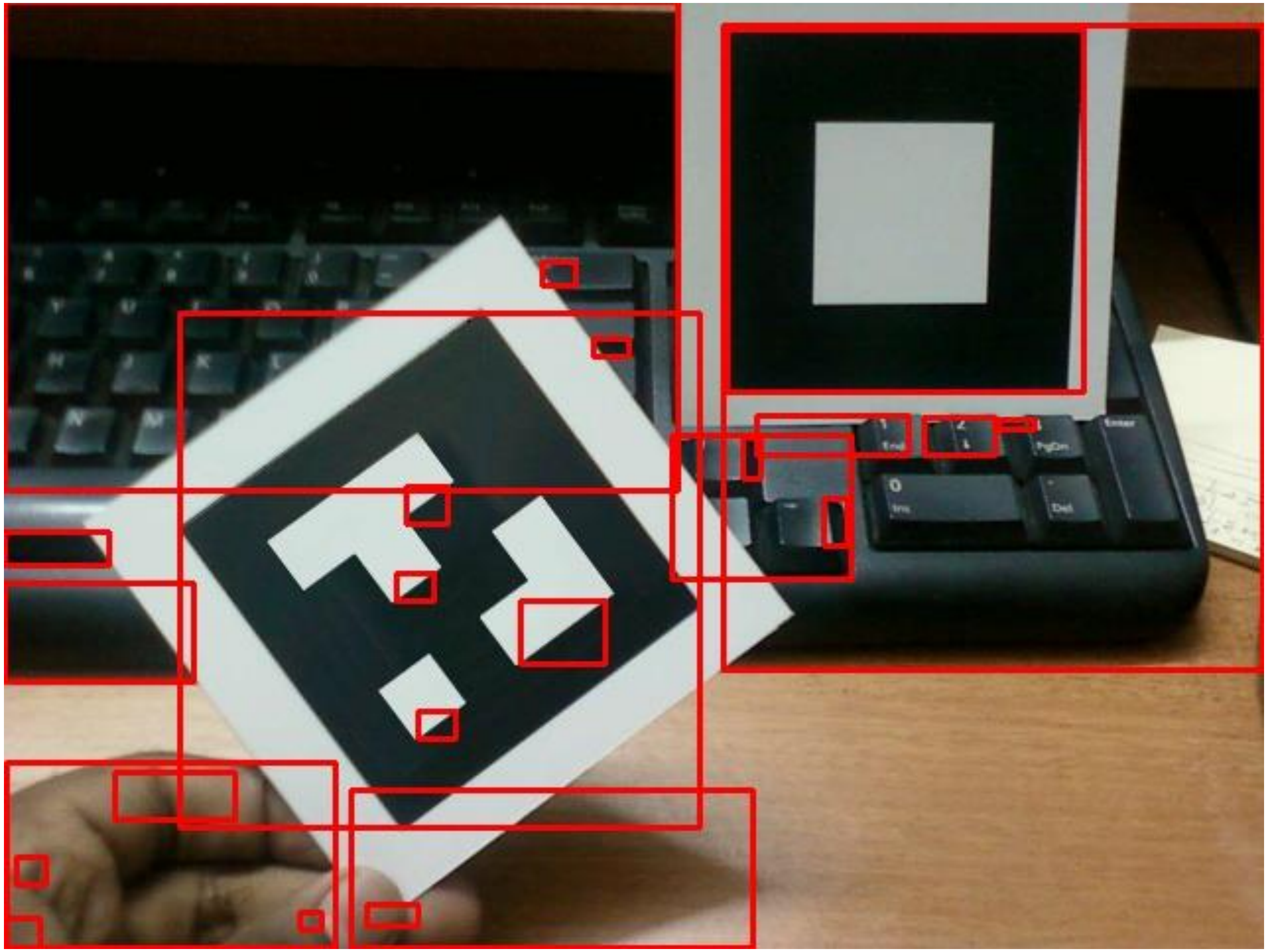
Adaptive Threshold



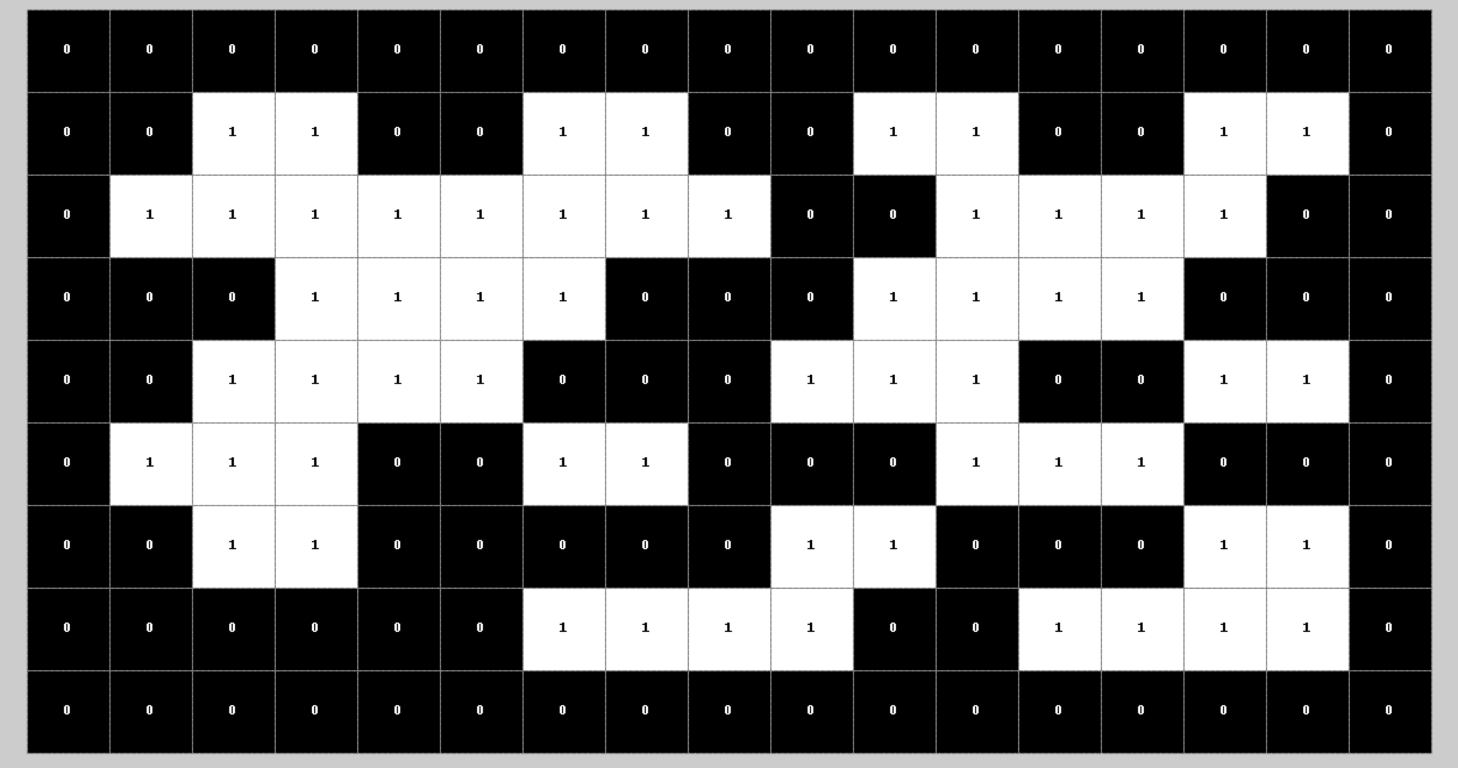
Threshold by Otsu method



Connected component Analysis

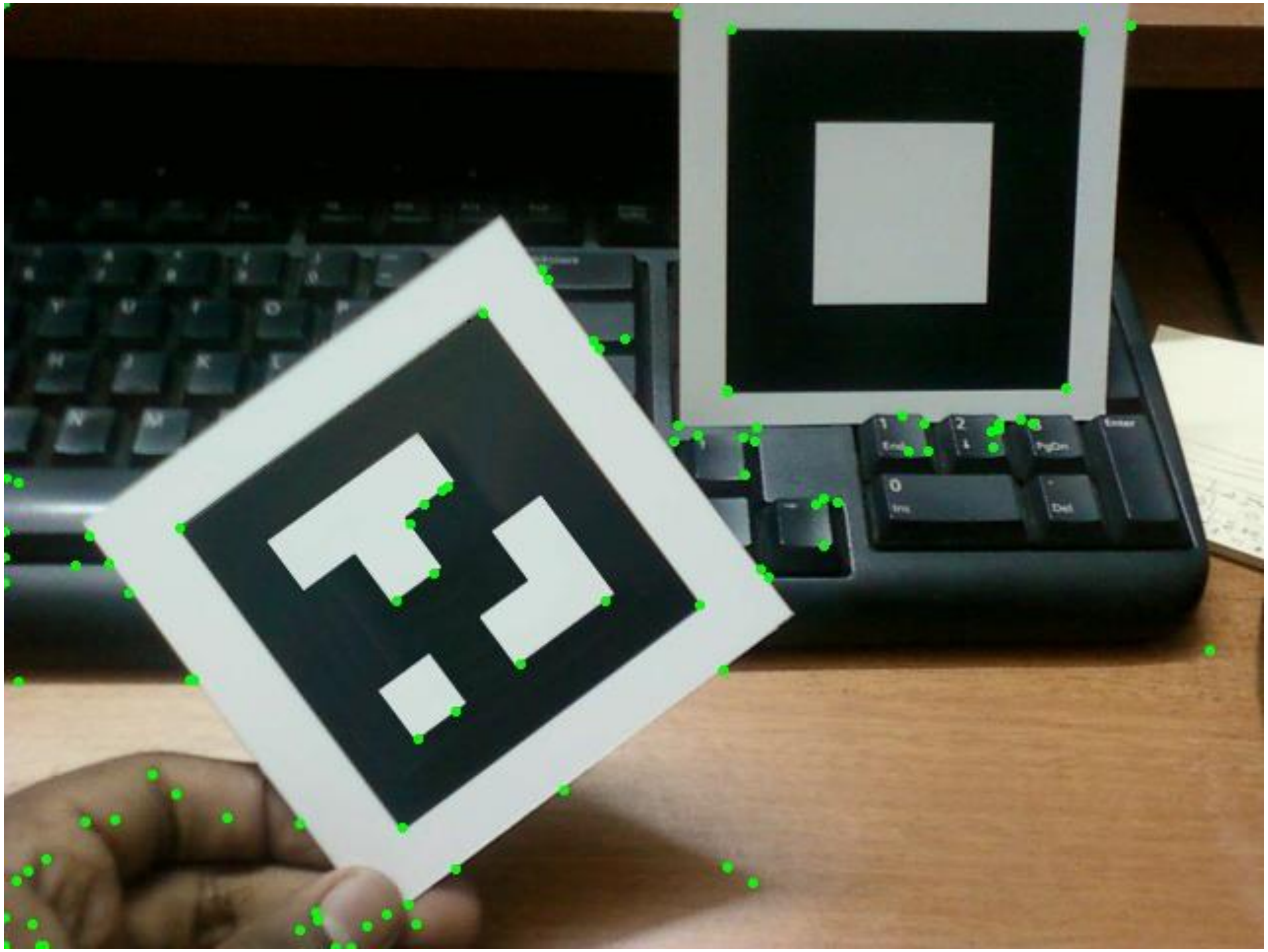


Connectivity

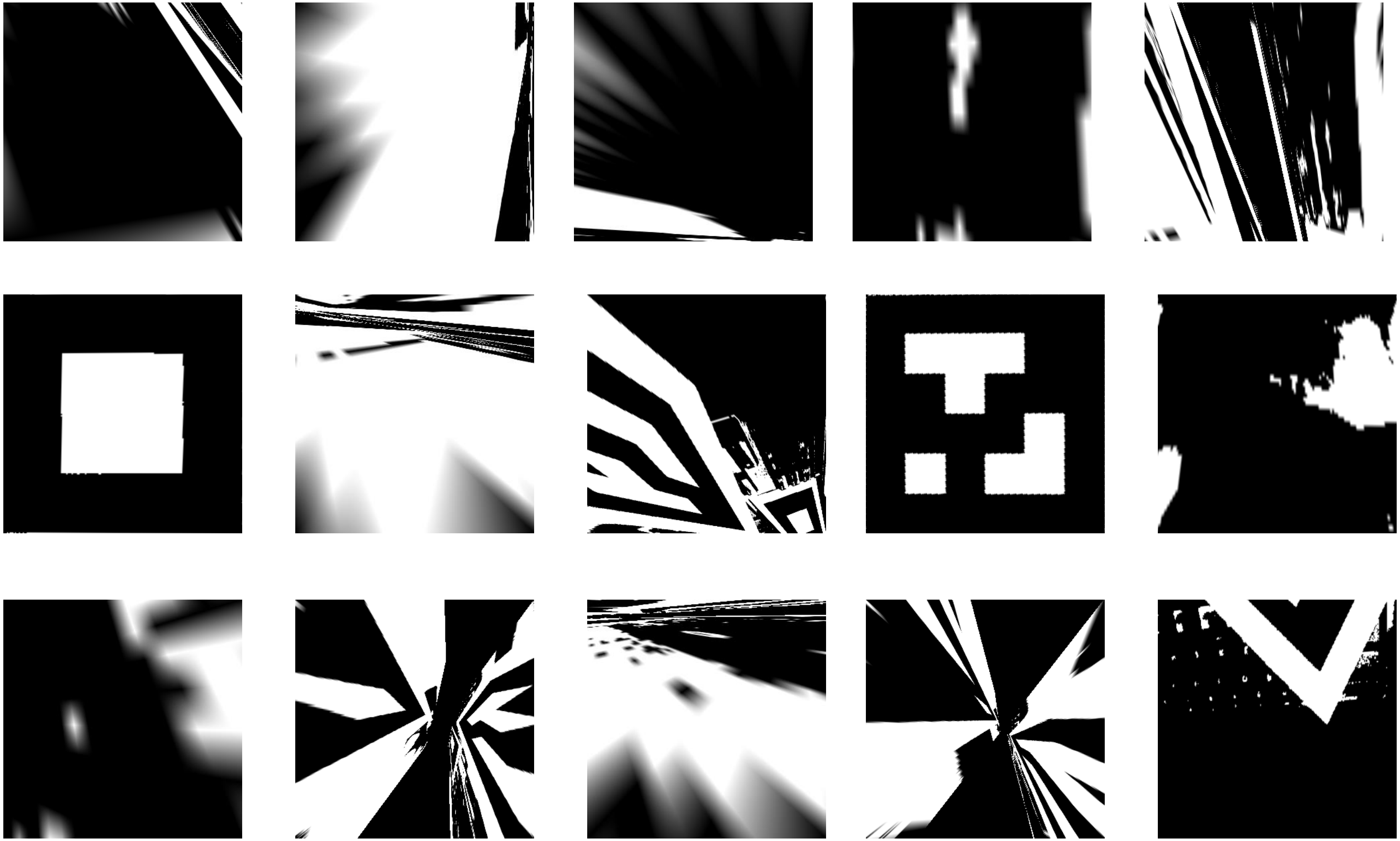


0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0
0	0	0	1	1	1	1	0	0	0	1	1	1	1	0	0	0
0	0	1	1	1	1	0	0	0	1	1	1	0	0	1	1	0
0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	0
0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	1	0
0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

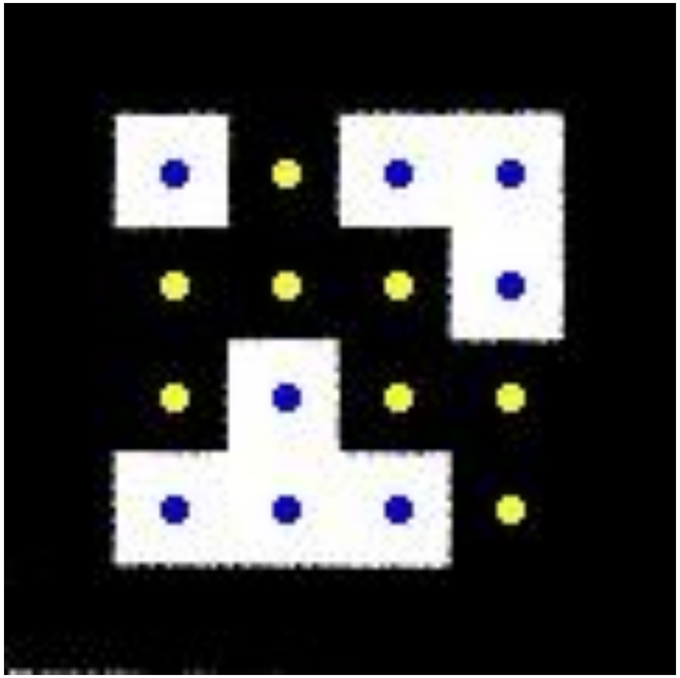
Corner Detection



Marker Classification



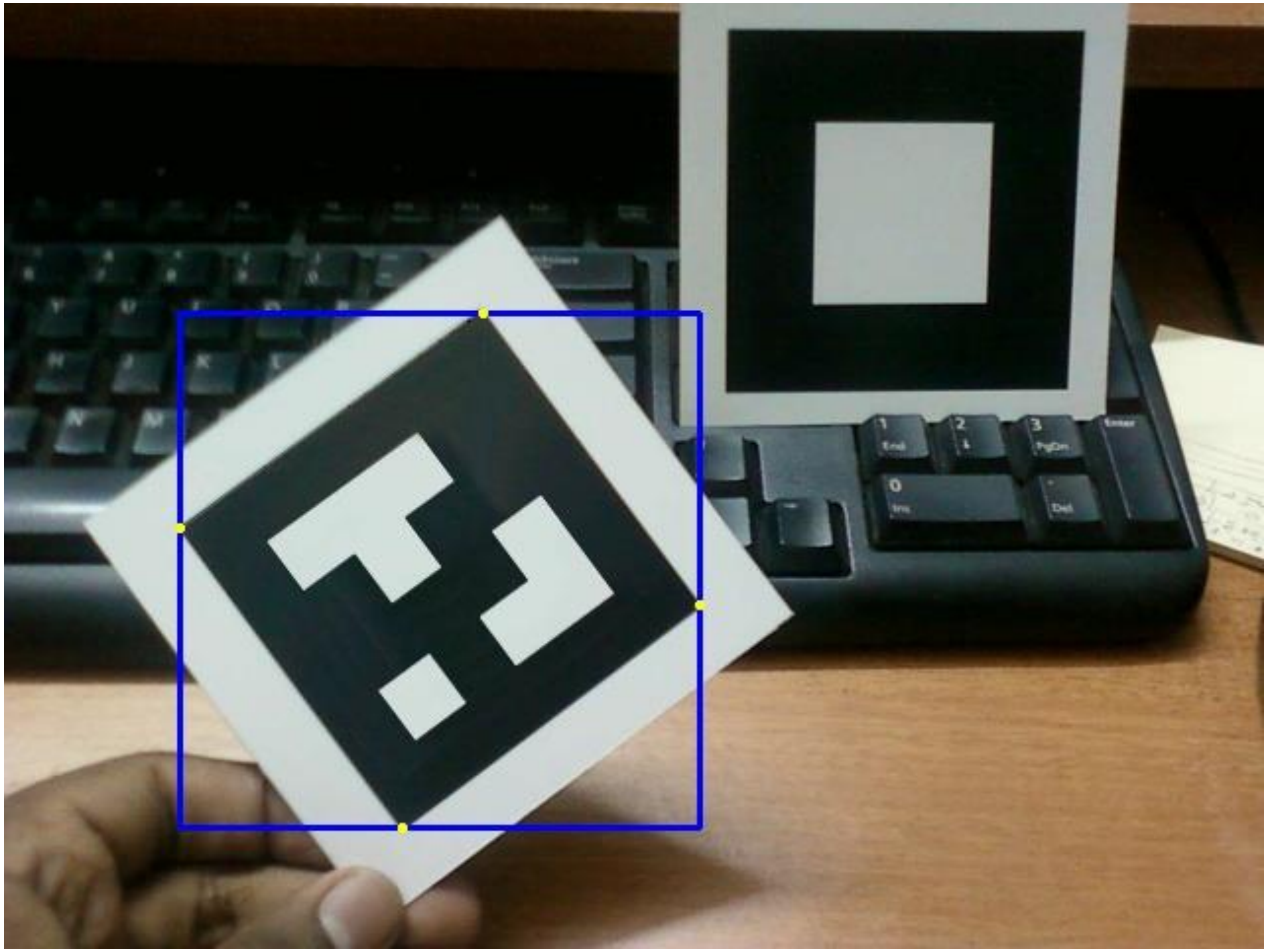
Marker Decoding



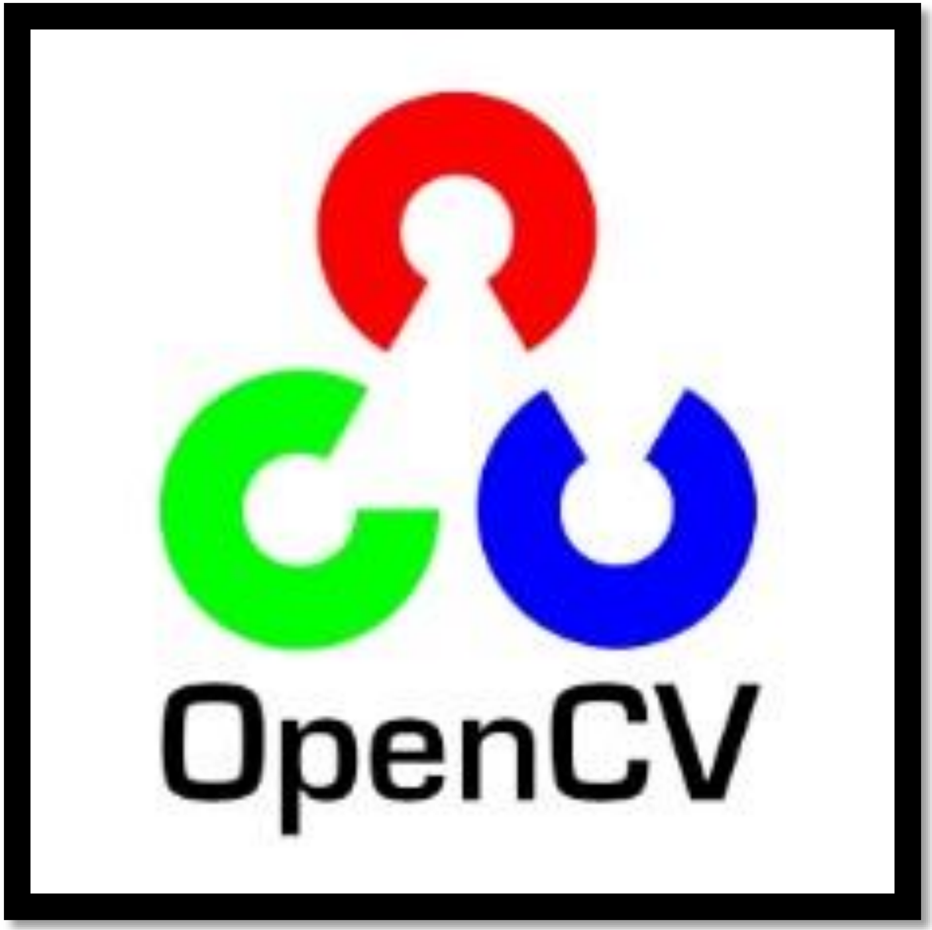
16 bit Binary Data-

1	0	1	1
0	0	0	1
0	1	0	0
1	1	1	0

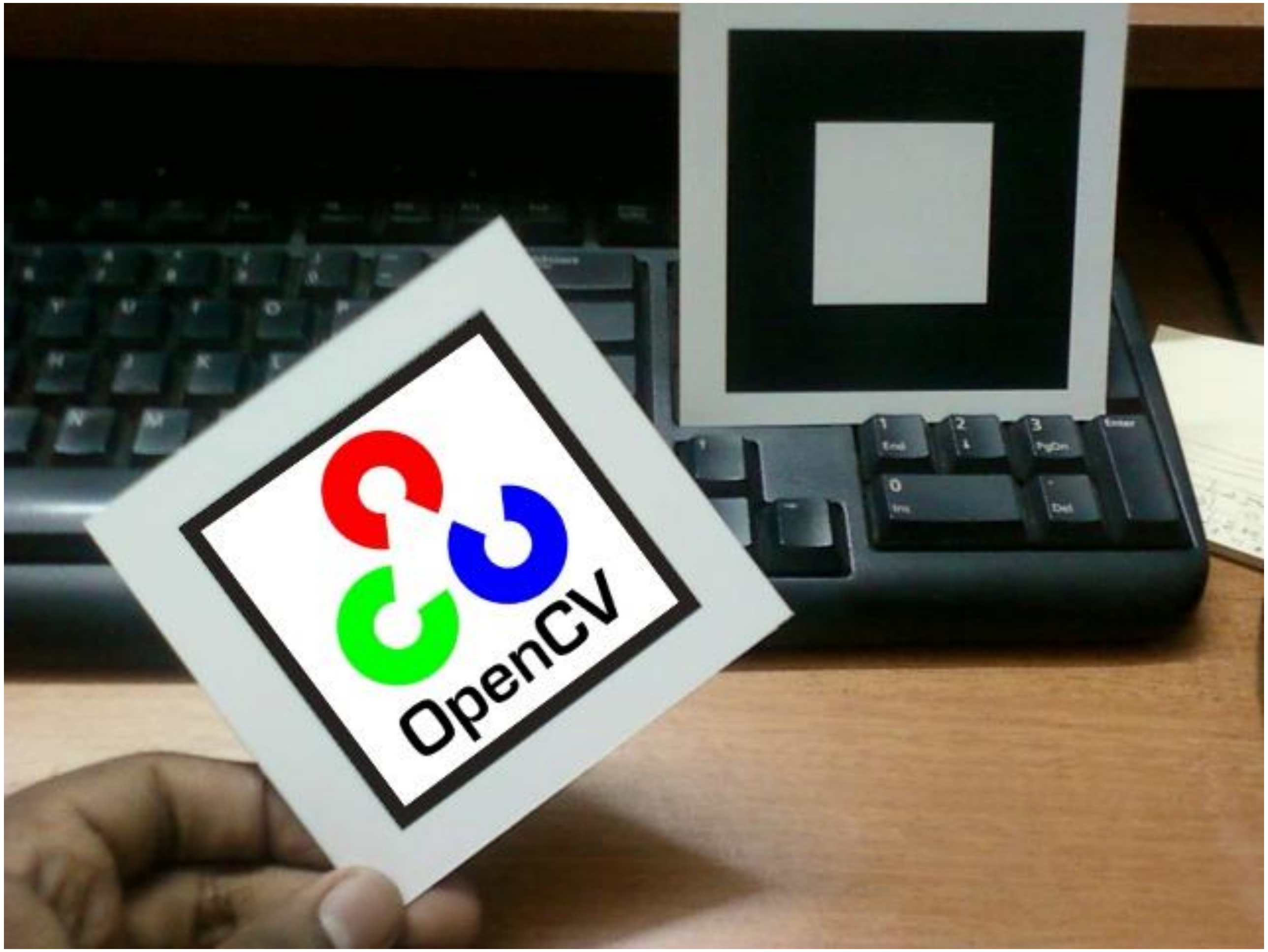
Marker Validation



Augmentation (Overlay image)



Augmentation (cont'd.)



Key features

Simple, Fast and Accurate

Increased performance by reducing the use of template matching

Cross-platform library used as backbone

Thank You