Getting Started

Session 1

Computer Vision Group
IIT Madras

December 1, 2014

Outline

Installing OpenCV

Windows 7/8

- Install Anaconda 2.0.1
- Download OpenCV 2.4.9 and extract to a convenient location
- Go to opencv/build/python/2.7 folder
- Copy cv2.pyd to INSTALL_DIRECTORY/Python/lib/site-packages
- Open IPython QT console.
- import cv2

If you don't get any errors, its a success.

Installing OpenCV

Ubuntu

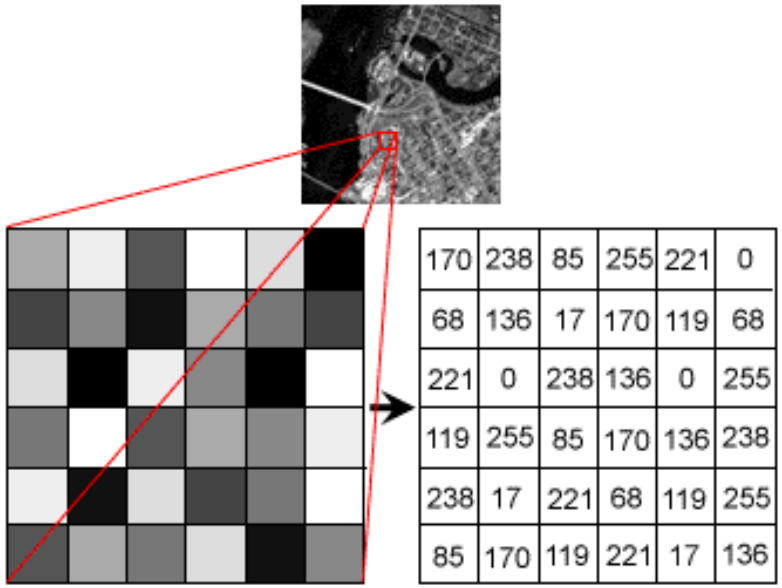
Using the apt-get tool

```
# sudo apt-get install python-opencv
```

Installs an older version of OpenCV. Build from source to get the latest version.

Pixels

Recap



- Basic building blocks of an image
- Color represented as a tuple (R, G, B)

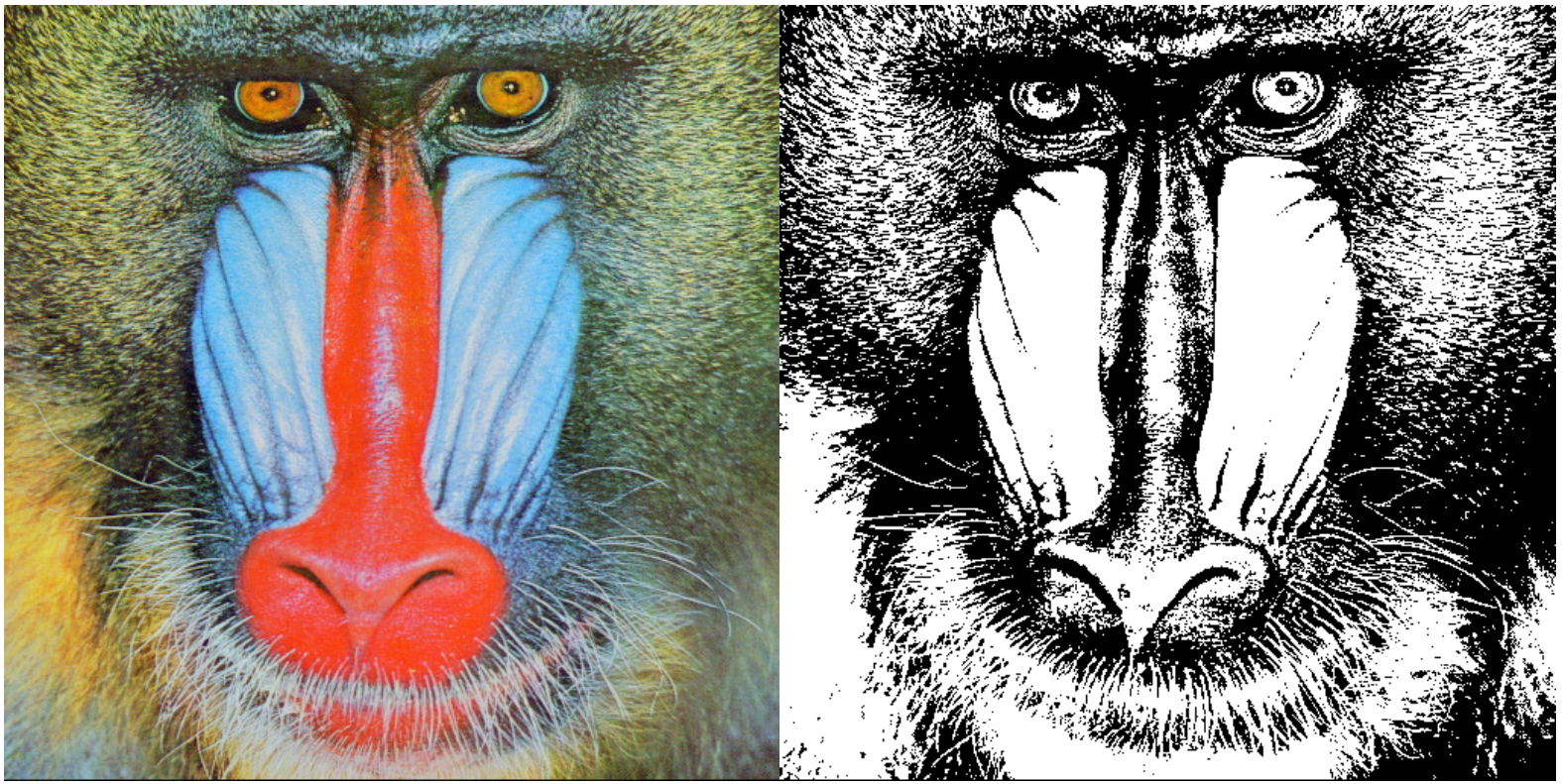
Image Processing

Recap

- Thresholding
- Erosion
- Dilation

Thresholding

Image Processing



Erosion

Image Processing

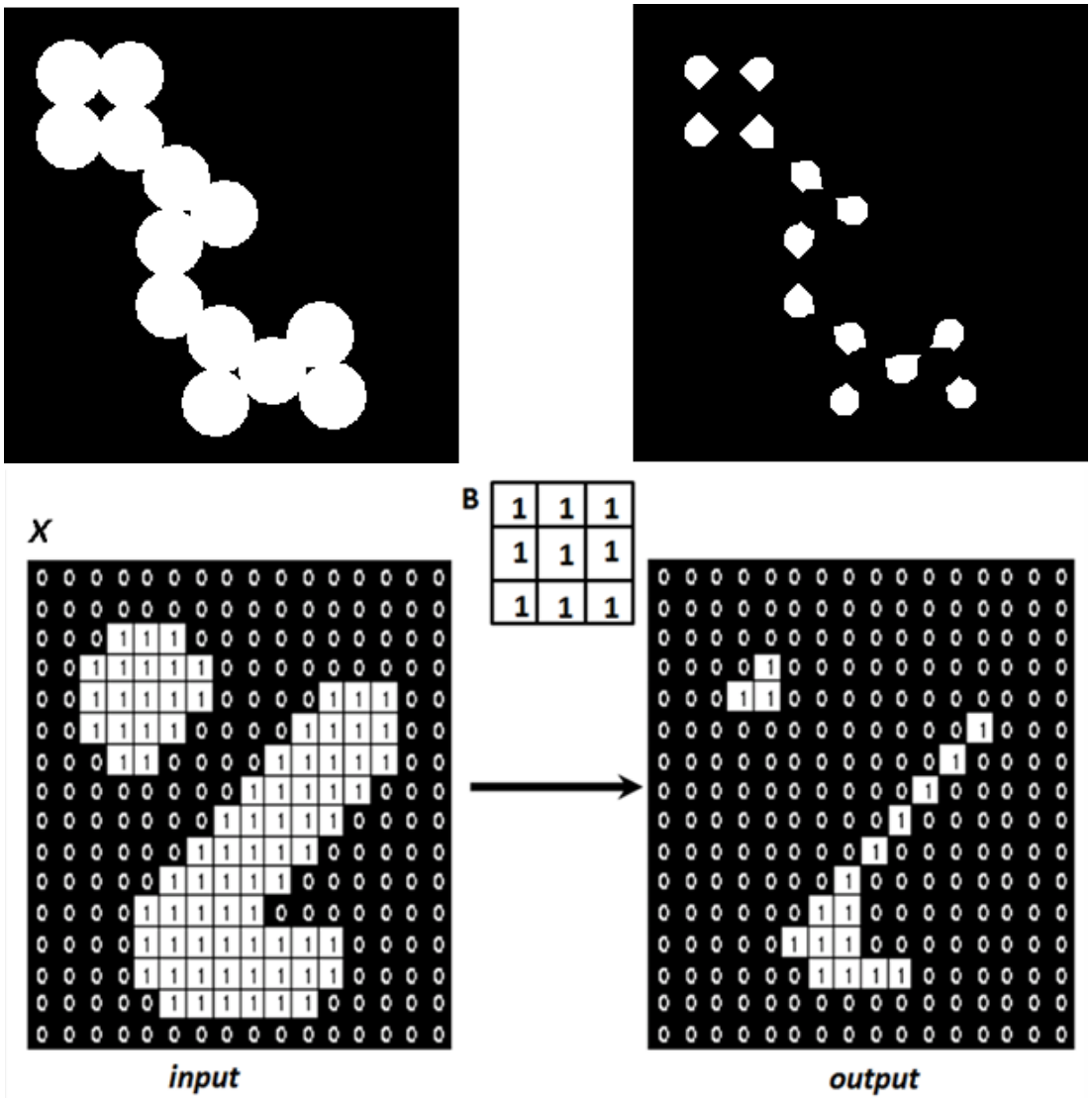


Figure 2. Effect of erosion using a 3X3 square structural element B.

Dilation

Image Processing

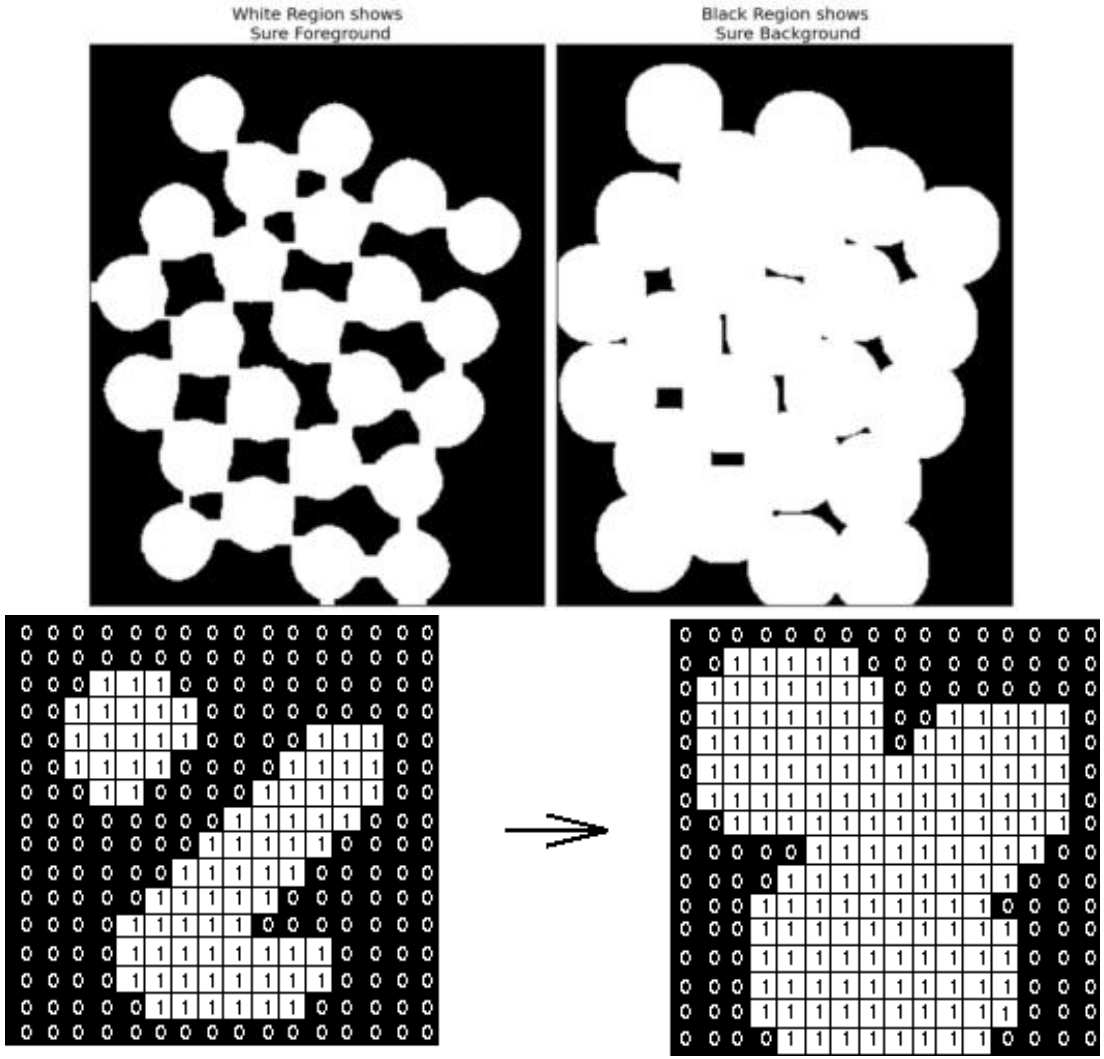


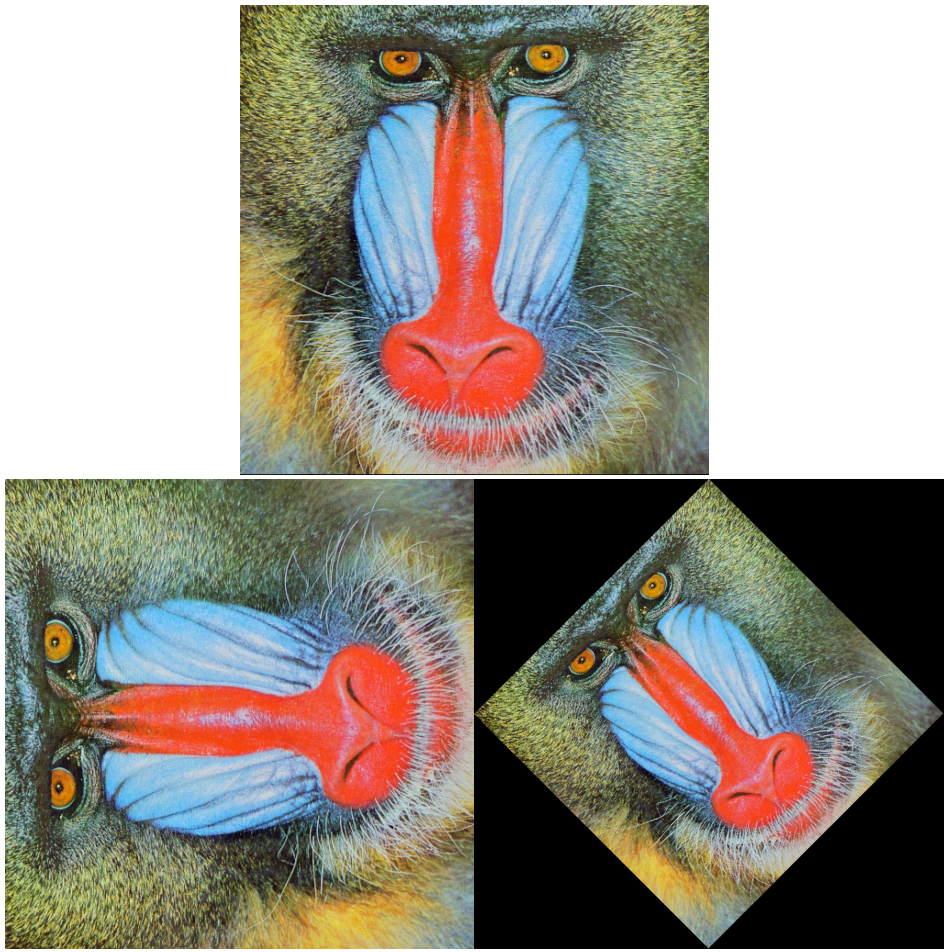
Image Transformation

Fairly Simple

- Rotation
- Translation
- Cropping
- Warping

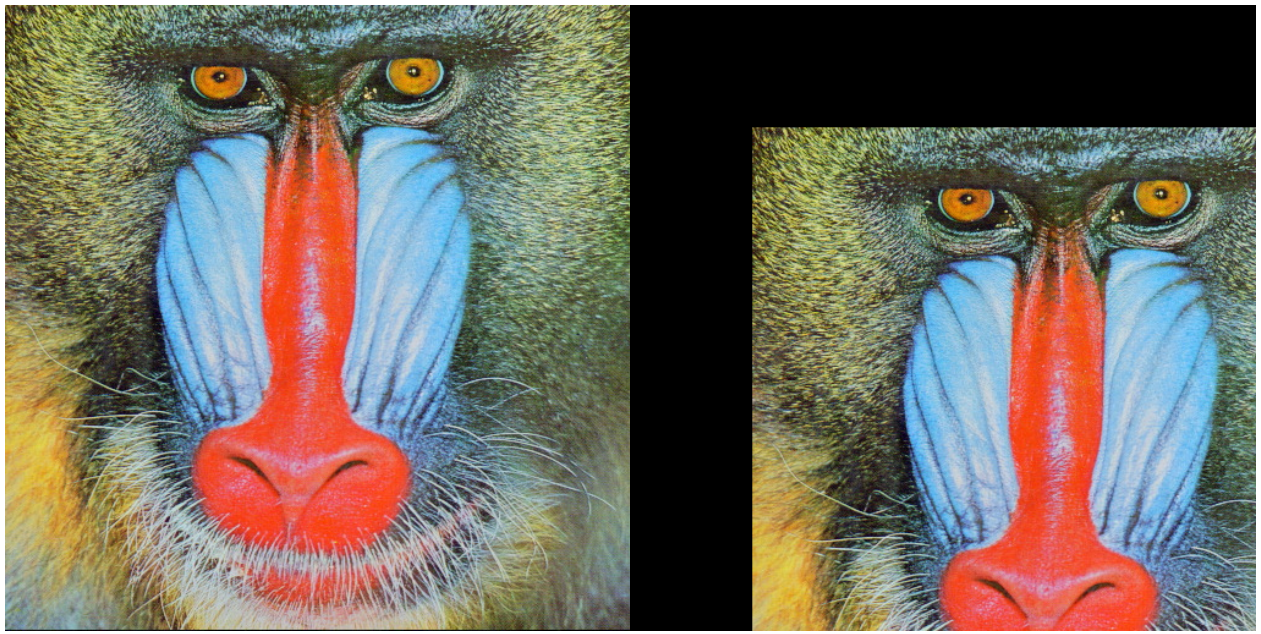
Rotation

Image Transformation



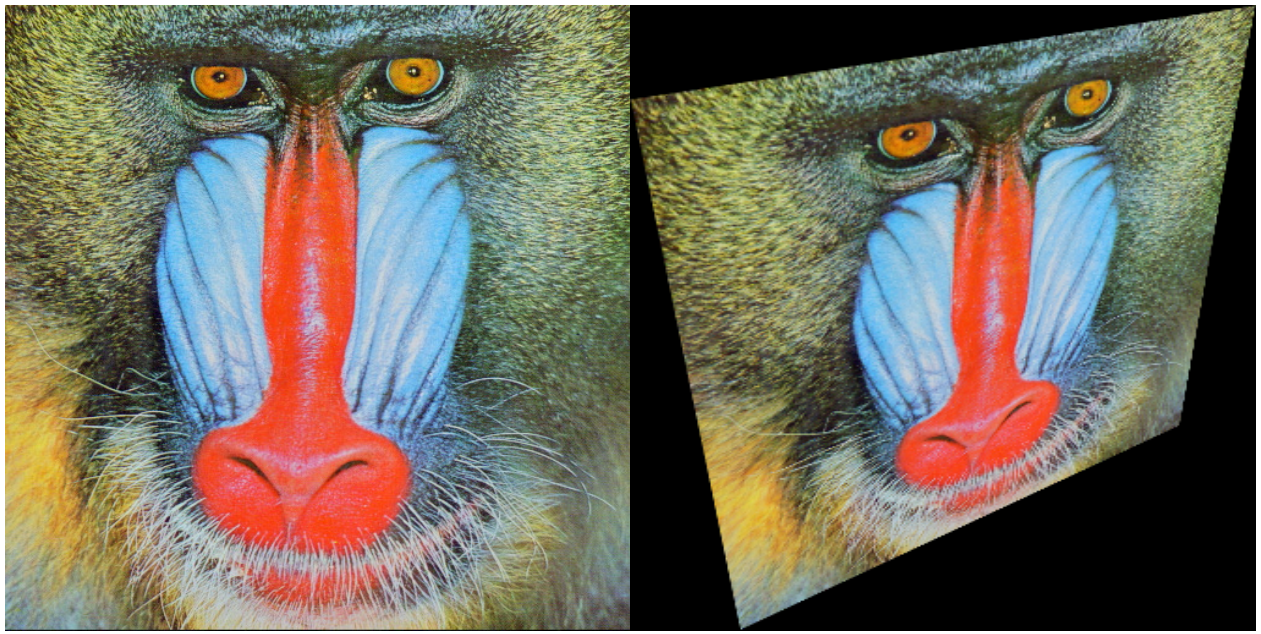
Translation

Image Transformation



Warping

Image Transformation



Feature Extraction

What are features?

Feature Extraction in Images

Transforming rich content of images into a set of values. Feature extraction is a crucial part in Machine Learning.

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Example

Histograms are commonly used for extracting set of features. More feature extraction techniques coming up.

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Digit Recognizer

We'll be using Machine Learning to build a digit recognizer in tomorrow's session.

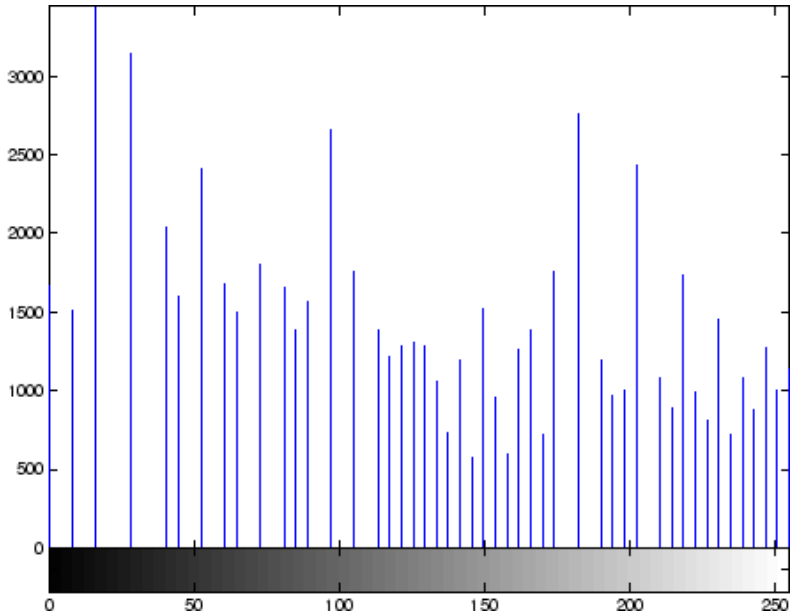
Feature Extraction Tools

There are many more available

1. Binarized pixel values
2. Intensity histogram
3. Histogram of Oriented gradients
4. SIFT

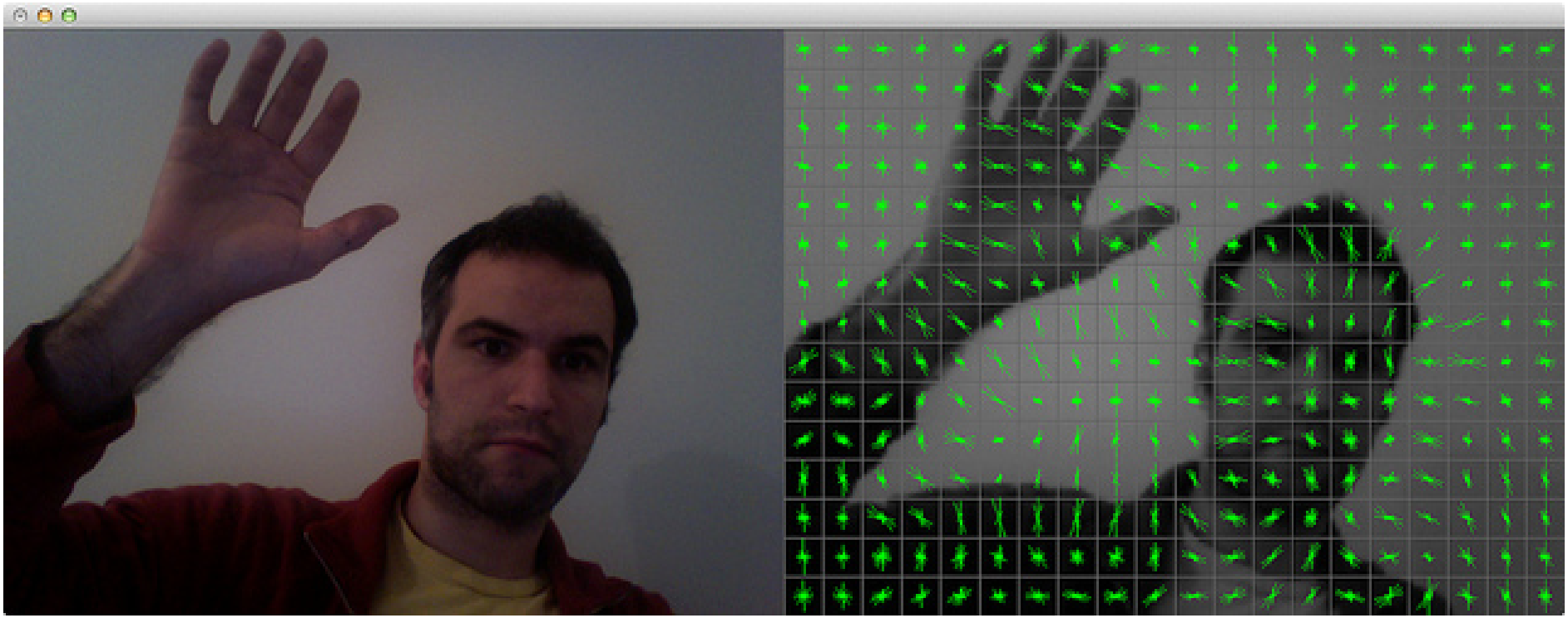
Intensity Histogram

Feature Extraction



Histogram of Oriented Gradients

Feature Extraction



Summary

Today's session

- Image processing/transformations
- Feature Extraction

Tomorrow's session

- Machine Learning Basics
- Training a classifier for handwritten digit recognition