PyImageSearch Gurus

A ***course*** and ***community*** designed to take you from computer vision *beginner* to *expert*. **Guaranteed**

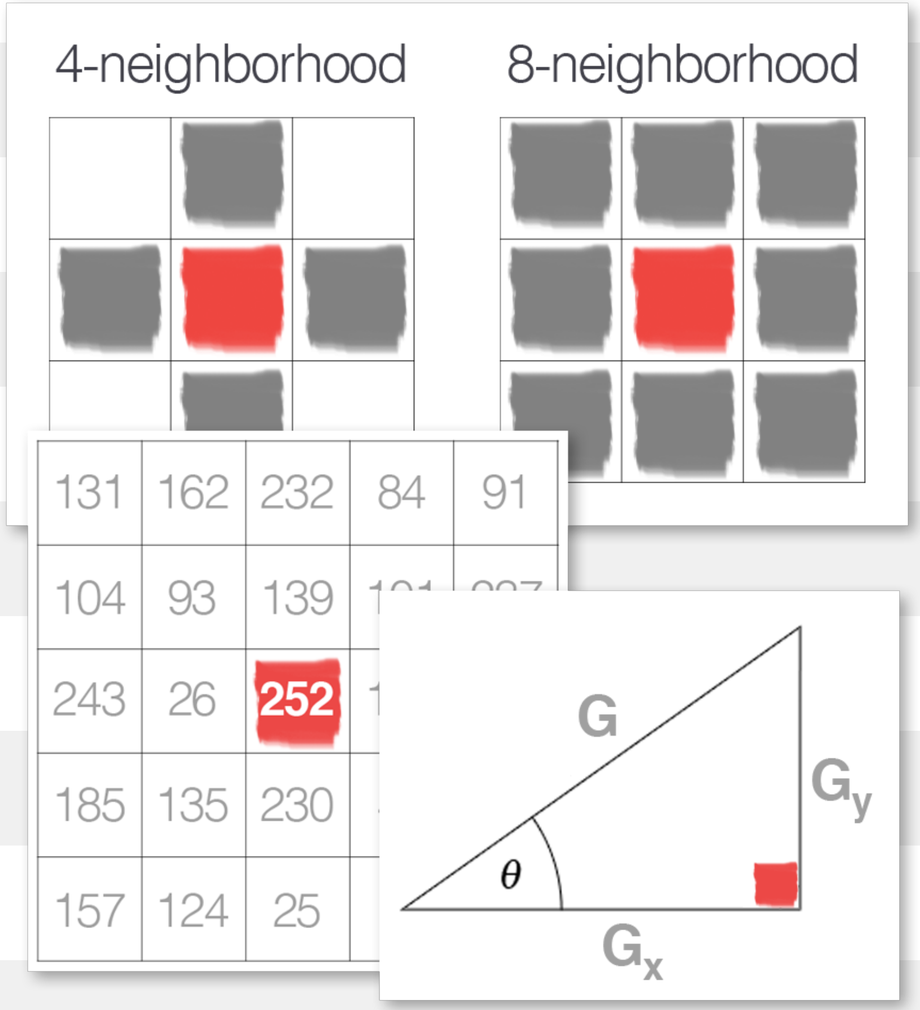
The PyImageSearch Gurus course covers **13 modules** broken out into **168 lessons**, with other **2,161 pages** of content — this syllabus lists *each* and *every* lesson inside the course. To check out the syllabus, *just move to the next slide*.

Computer Vision & Image Processing Basics

1.1	Loading, displaying, and saving images
1.2	Image basics
1.3	Drawing
1.4	Basic image processing
1.4.1	Translation
1.4.2	Rotation
1.4.3	Resizing
1.4.4	Flipping
1.4.5	Cropping
1.4.6	Image arithmetic

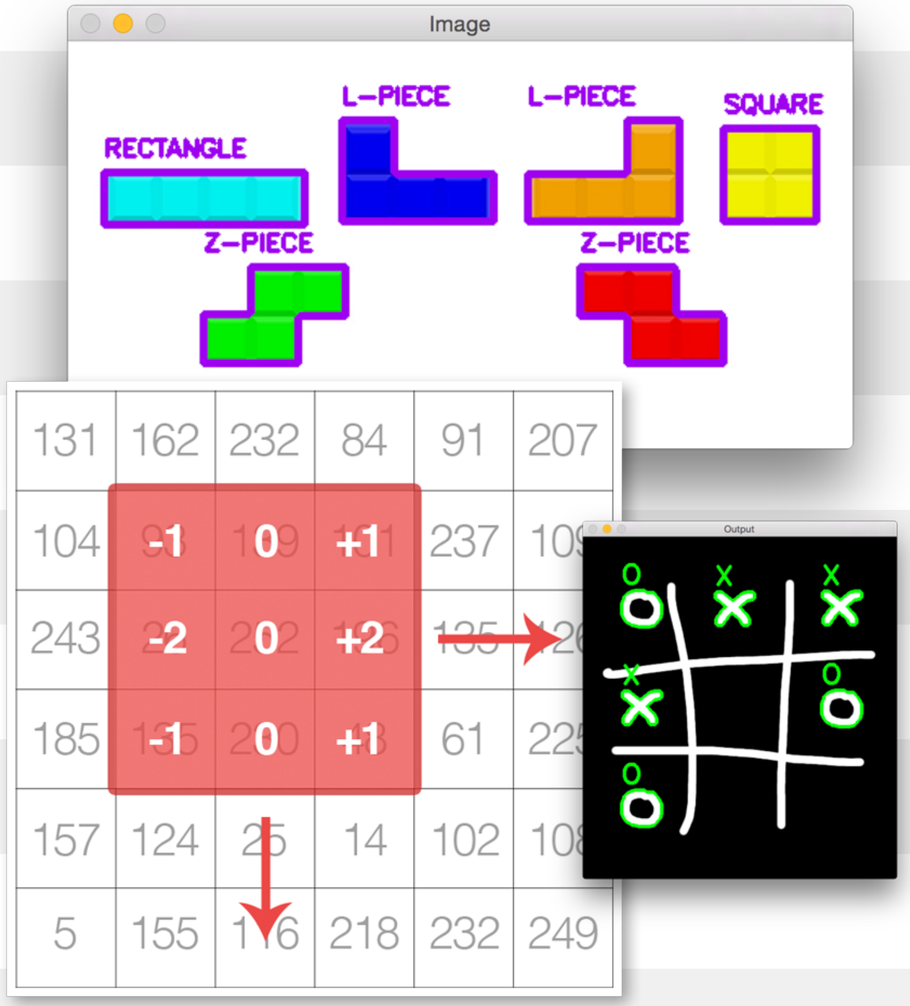
Computer Vision & Image Processing Basics (cont.)

1.4.7	Bitwise operations
1.4.8	Masking
1.4.9	Splitting and merging channels
1.5	Kernels
1.6	Morphological operations
1.7	Smoothing and blurring
1.8	Lighting and color spaces
1.9	Thresholding
1.10	Gradients and edge detection
1.10.1	Gradients



Computer Vision & Image Processing Basics (cont.)

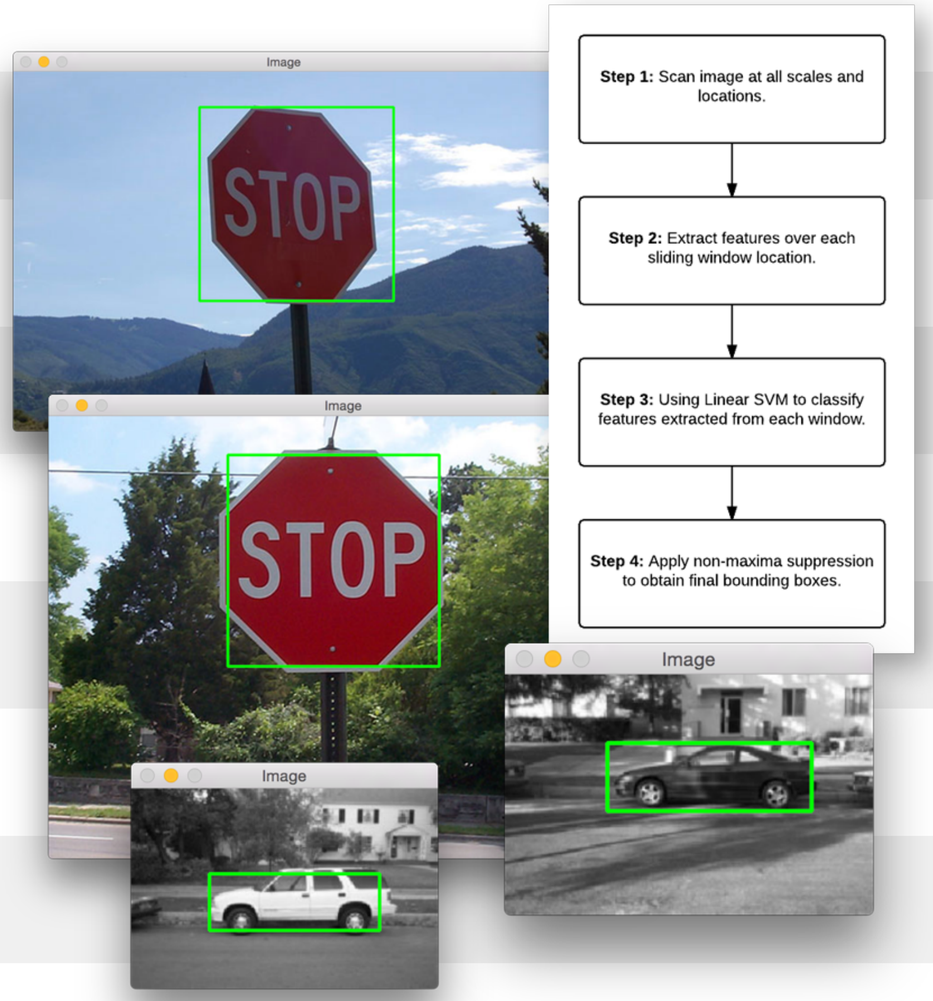
1.10.2	Edge detection
1.11	Contours
1.11.1	Finding and drawing contours
1.11.2	Simple contour properties
1.11.3	Advanced contour properties
1.11.4	Contour approximation
1.11.5	Sorting contours
1.12	Histograms
1.13	Connected-component labeling



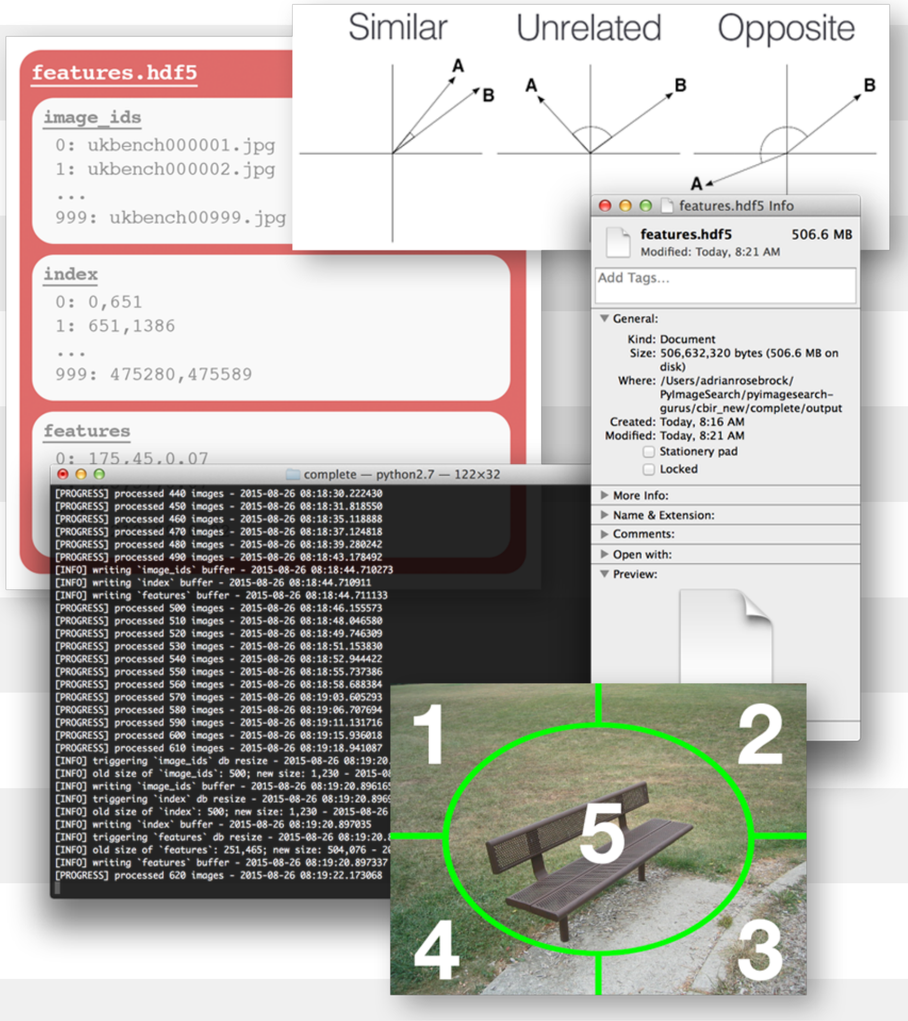
Train Your Own Custom Object Detectors

Train Your Own Custom Object Detectors (cont.)

2.4	The 6-step framework
2.5	Preparing your experiment and training data
2.6	Constructing your HOG descriptor
2.7	The initial training phase
2.8	Non-maxima suppression
2.9	Hard-negative mining
2.10	Re-training and running your classifier
2.11	Training your custom object detector
2.12	Tips on training your own object detectors



Content-Based Image Retrieval



Content-Based Image Retrieval (cont.)

3.8.1	From multiple features to a single histogram
3.8.2	Forming a BOVW
3.9	Inverted indexes and searching
3.9.1	What is Redis?
3.9.2	Building an inverted index
3.9.3	Performing a search
3.10	Spatial verification
3.11	Tf-idf weighting
3.12	Spatial verification
3.12.1	Implementing spatial verification
3.12.2	Searching with spatial verification
3.13.3	Evaluating search with spatial verification

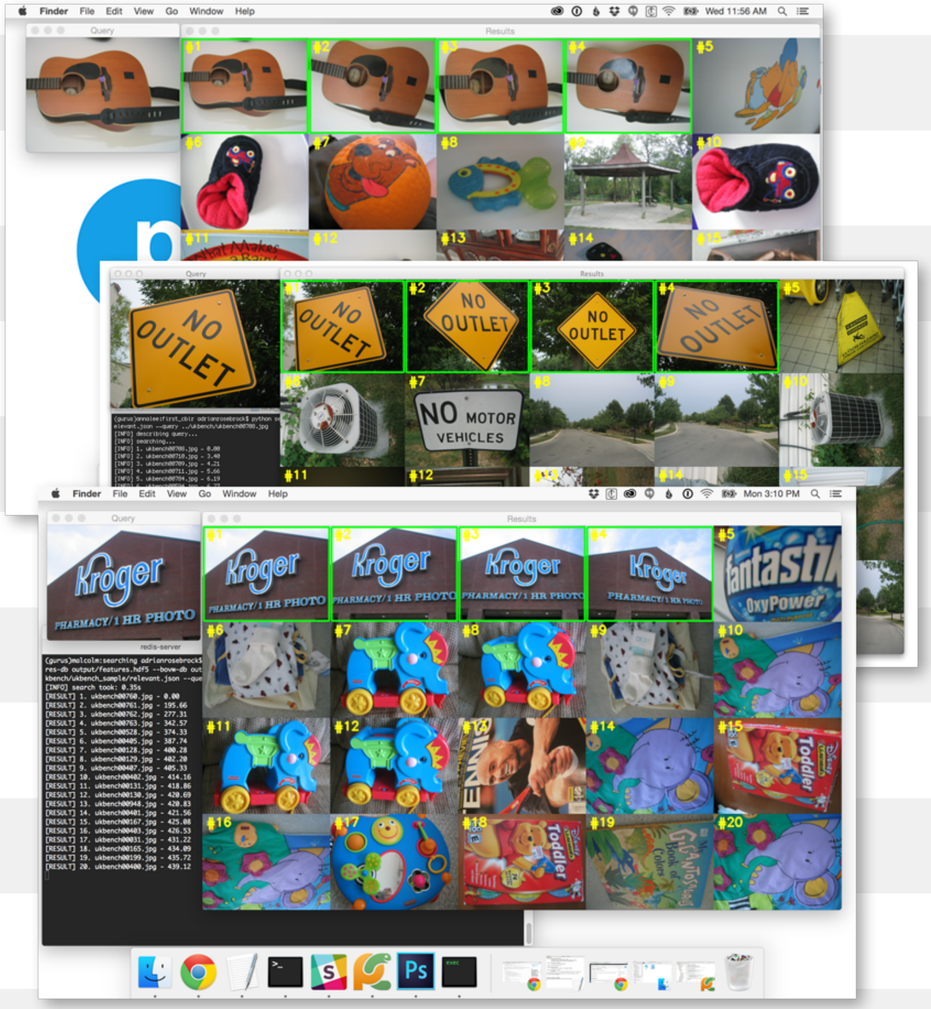


Image Classification + Machine Learning

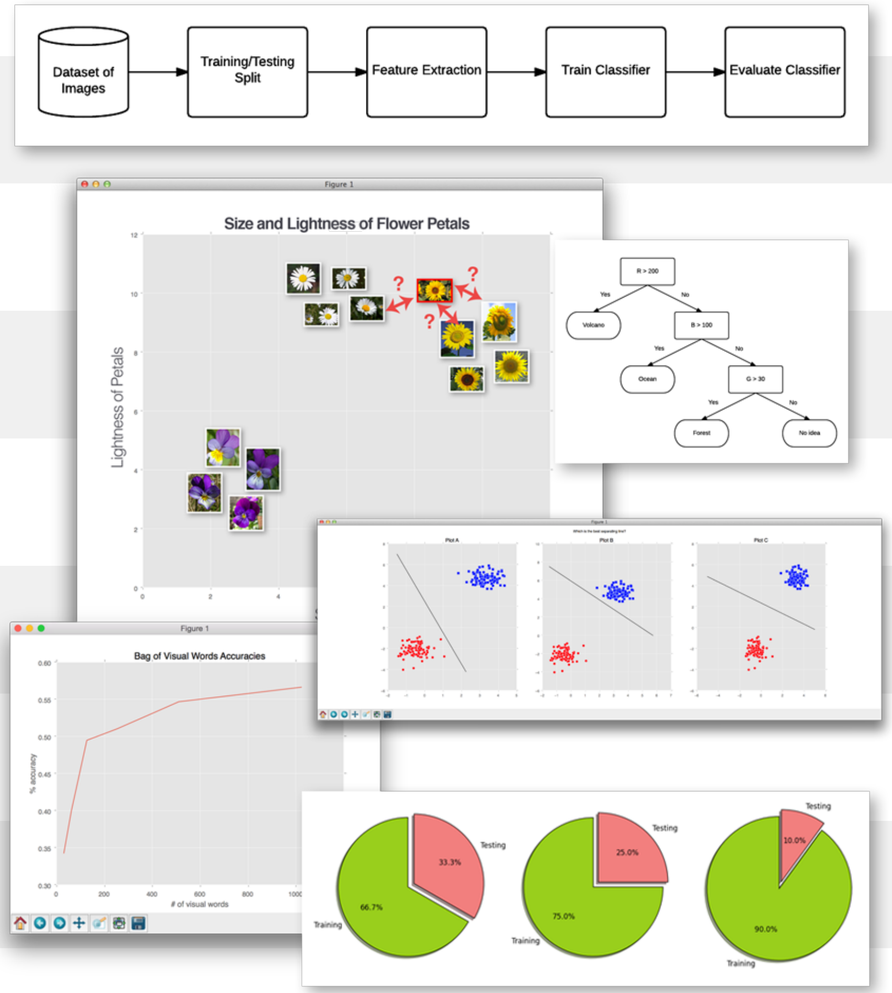
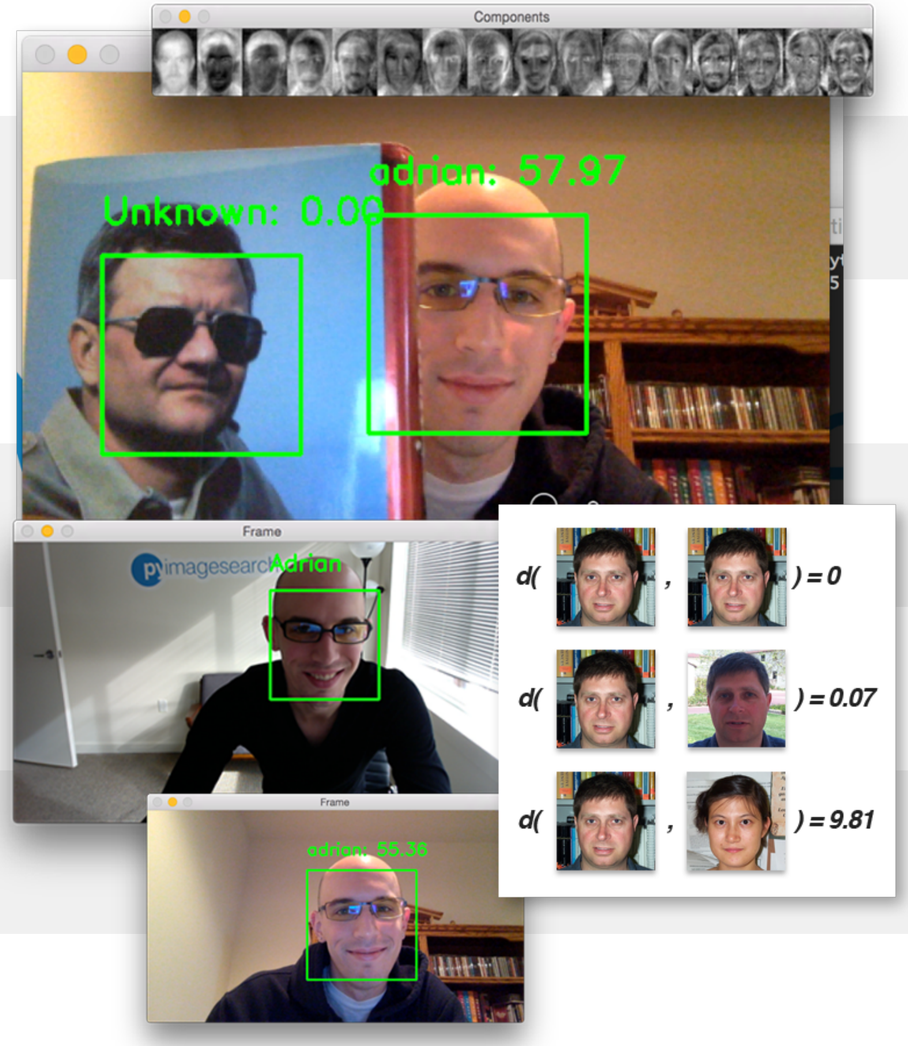


Image Classification + Machine Learning (cont.)

Face Recognition

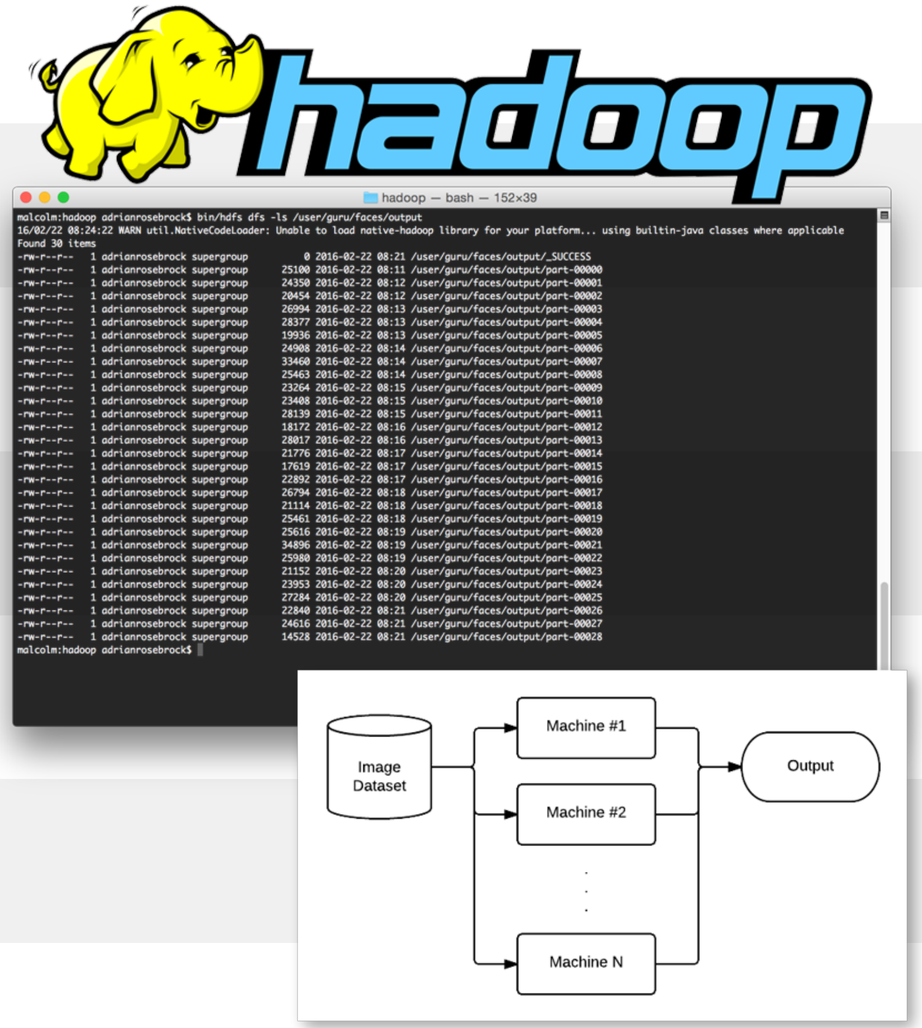
5.1	What is face recognition?
5.2	LBPs for face recognition
5.3	The Eigenfaces algorithm
5.4	Preparing and pre-processing your own face data
5.5	The complete face recognition pipeline



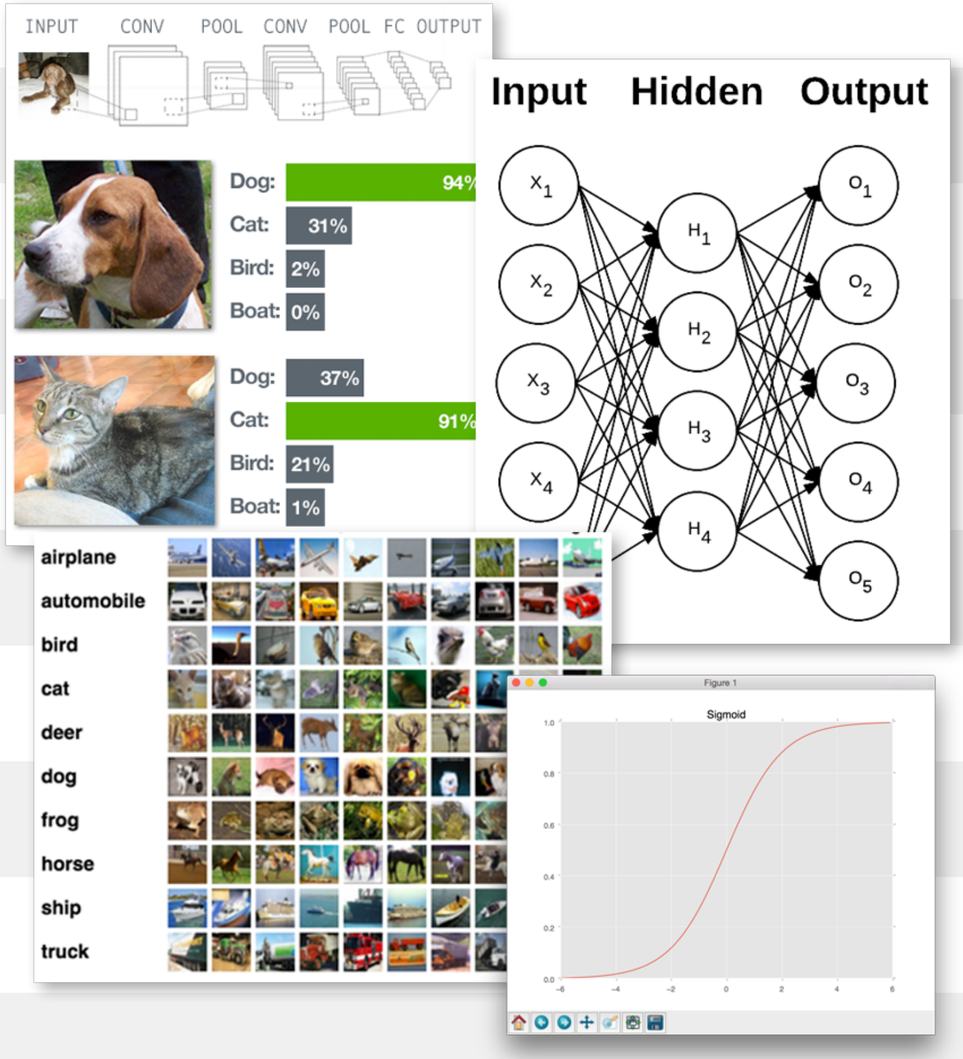
Automatic License Plate Recognition (ANPR)

Hadoop + Big Data for Computer Vision

7.1	Introduction to Hadoop and MapReduce
7.2	Setting up Hadoop on your machine
7.3	Preparing your images for use on HDFS
7.4	Running computer vision jobs on MapReduce
7.5	High-throughput face detection
7.6	High-throughput feature extraction

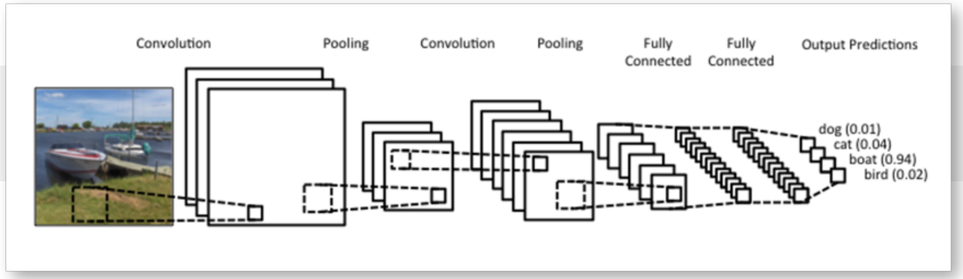


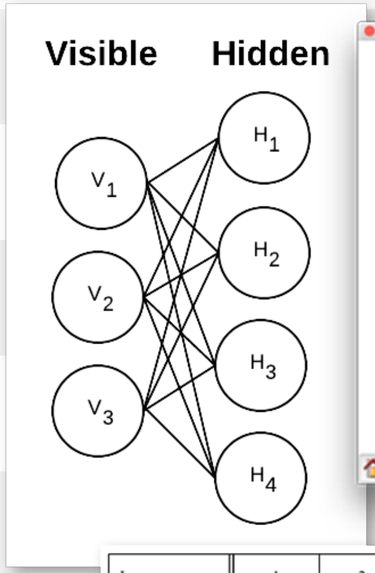
Deep Learning and Convolutional Neural Networks

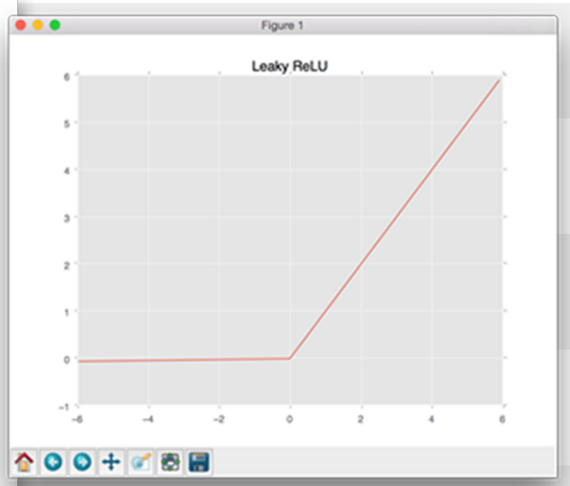


Deep Learning and Convolutional Neural Networks (cont.)

8.5.1	A CNN primer
8.5.2	Training your first CNN
8.6	Implementing CNN architectures
8.6.1	LeNet
8.6.2	KarpathyNet
8.6.3	MiniVGGNet
8.6.4	Running a pre-trained network
8.7	The OverFeat framework
8.7.1	What is OverFeat?
8.7.2	OverFeat example: dogs and cats







Layer	1	2	3	4	5	6	7	Output 8
Stage	conv + max	conv + max	conv	conv	conv + max	full	full	full
# channels	96	256	512	1024	1024	3072	4096	1000
Filter size	11x11	5x5	3x3	3x3	3x3	-	-	-
Conv. stride	4x4	1x1	1x1	1x1	1x1	-	-	-
Pooling size	2x2	2x2	-	-	2x2	-	-	-
Pooling stride	2x2	2x2	-	-	2x2	-	-	-
Zero-Padding size	-	-	1x1x1x1	1x1x1x1	1x1x1x1	-	-	-
Spatial input size	231x231	24x24	12x12	12x12	12x12	6x6	1x1	1x1

Deep Learning and Convolutional Neural Networks (cont.)

Raspberry Pi Computer Vision Projects

9.1	Installing OpenCV on your Raspberry Pi
9.2	Setting up your Raspberry Pi Camera
9.3	Accessing the Raspberry Pi camera and video stream
9.4	Home surveillance and motion detection
9.5	Face recognition for security

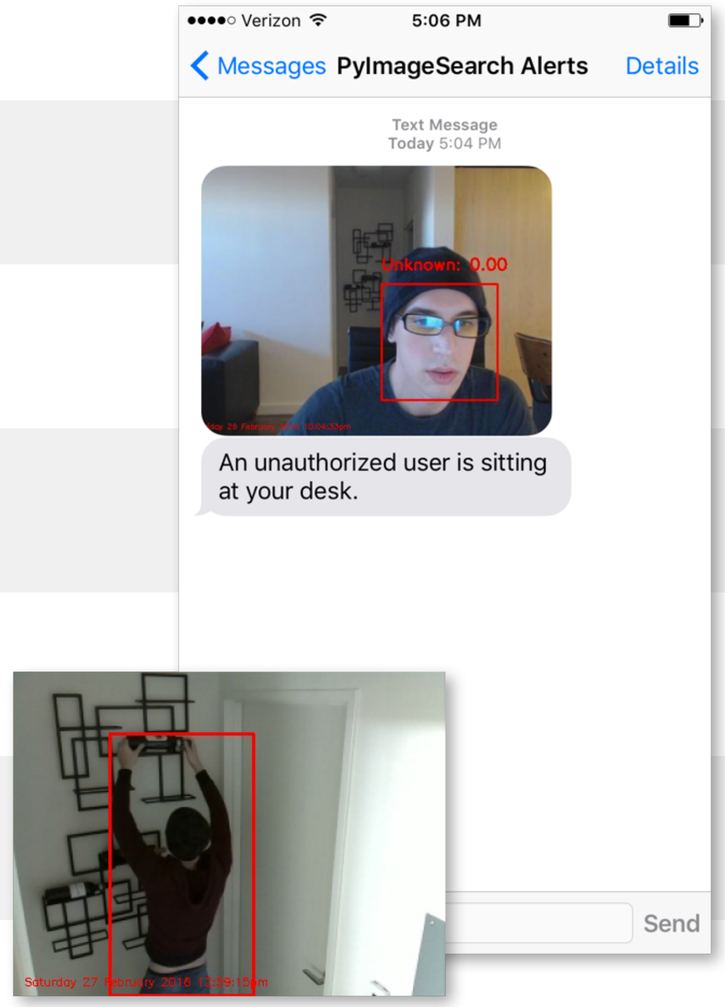


Image Descriptors

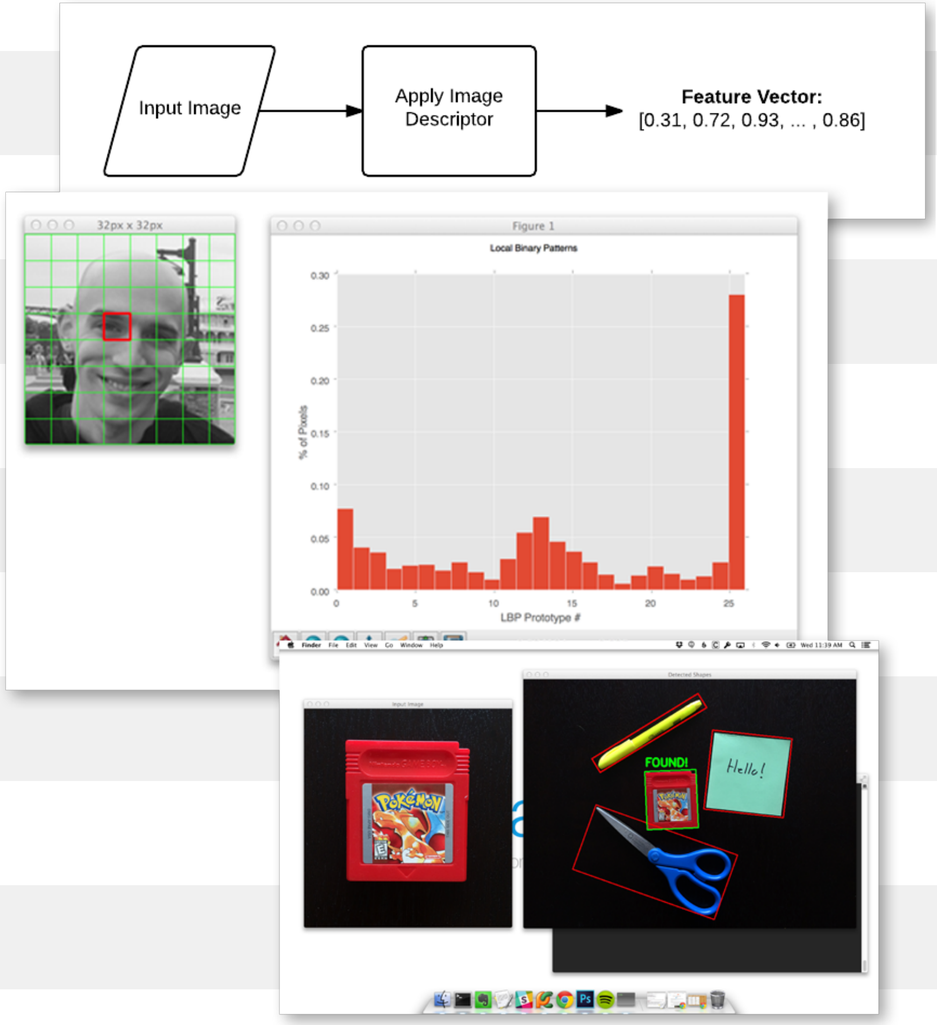
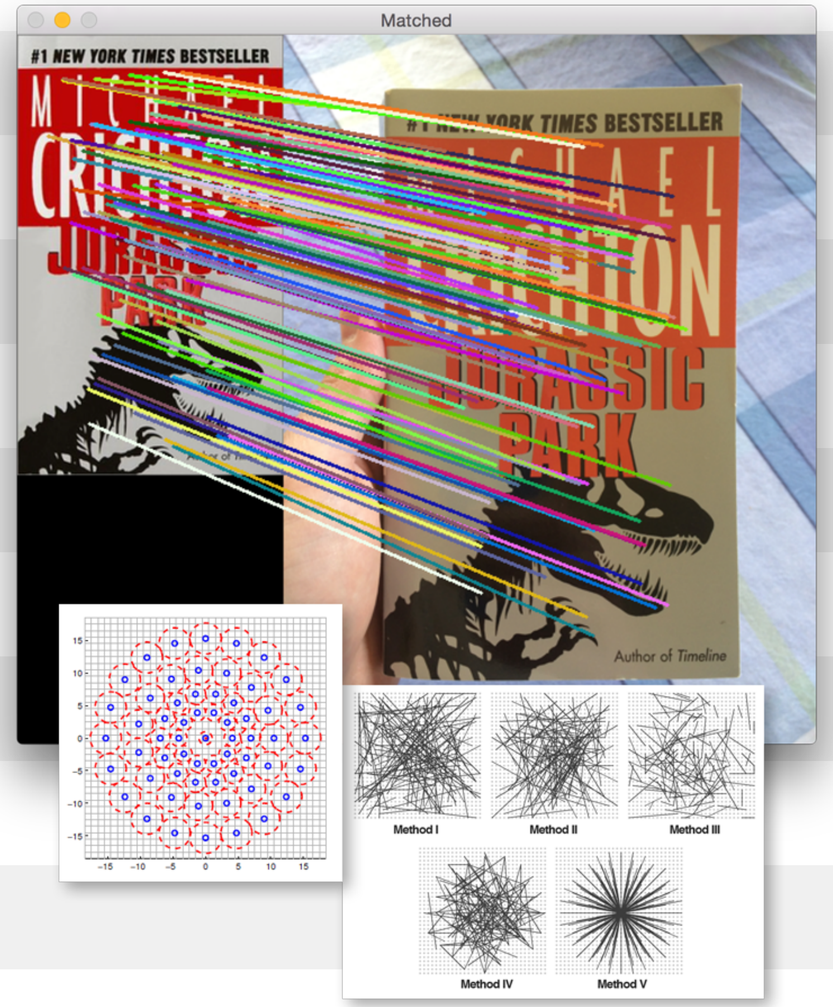


Image Descriptors (cont.)

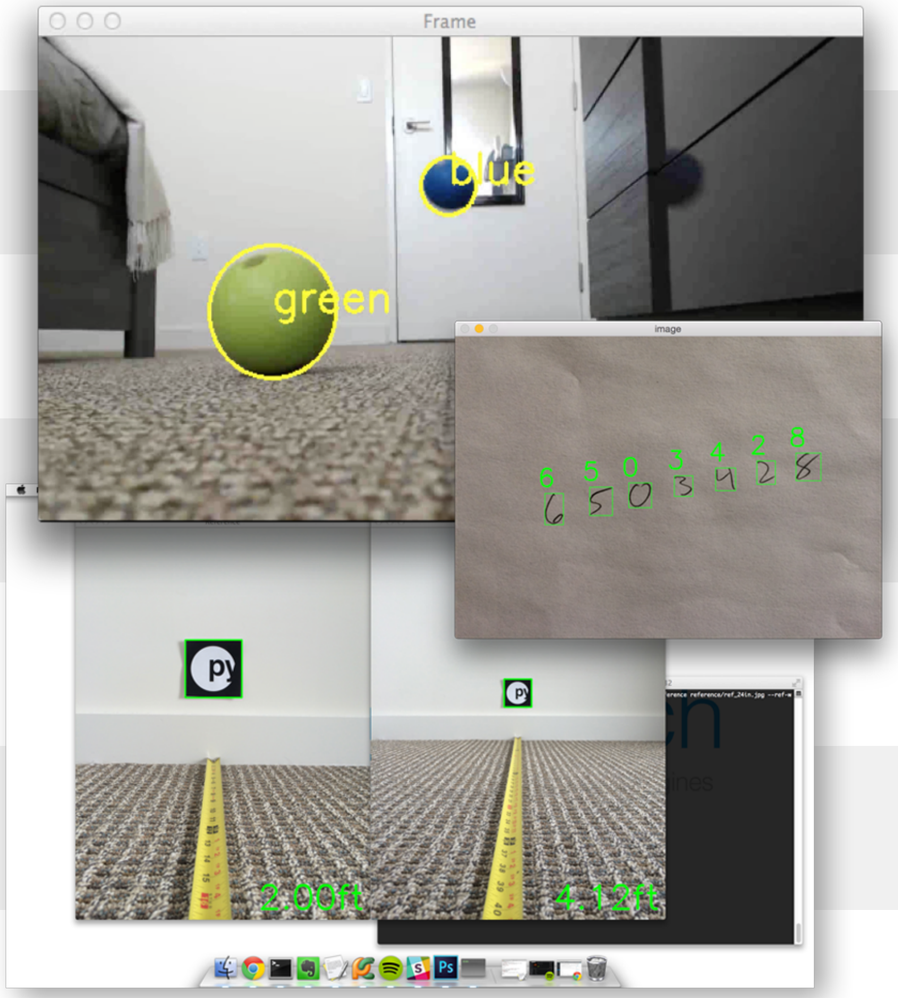
10.10.2	Harris
10.10.3	GFTT
10.10.4	DoG
10.10.5	Fast Hessian
10.10.6	STAR
10.10.7	MSER
10.10.8	Dense
10.10.9	BRISK
10.10.10	ORB
10.11	Local invariant descriptors
10.10.2	Harris

Image Descriptors (cont.)



Computer Vision Case Studies

11.1	Measuring distance from camera to object in image
11.2	Face detection in images
11.3	Face detection in video
11.4	Object tracking in video
11.5	Identifying the covers of books
11.6	Plant classification
11.7	Handwriting recognition



Building Computer Vision Apps for your Mobile Device

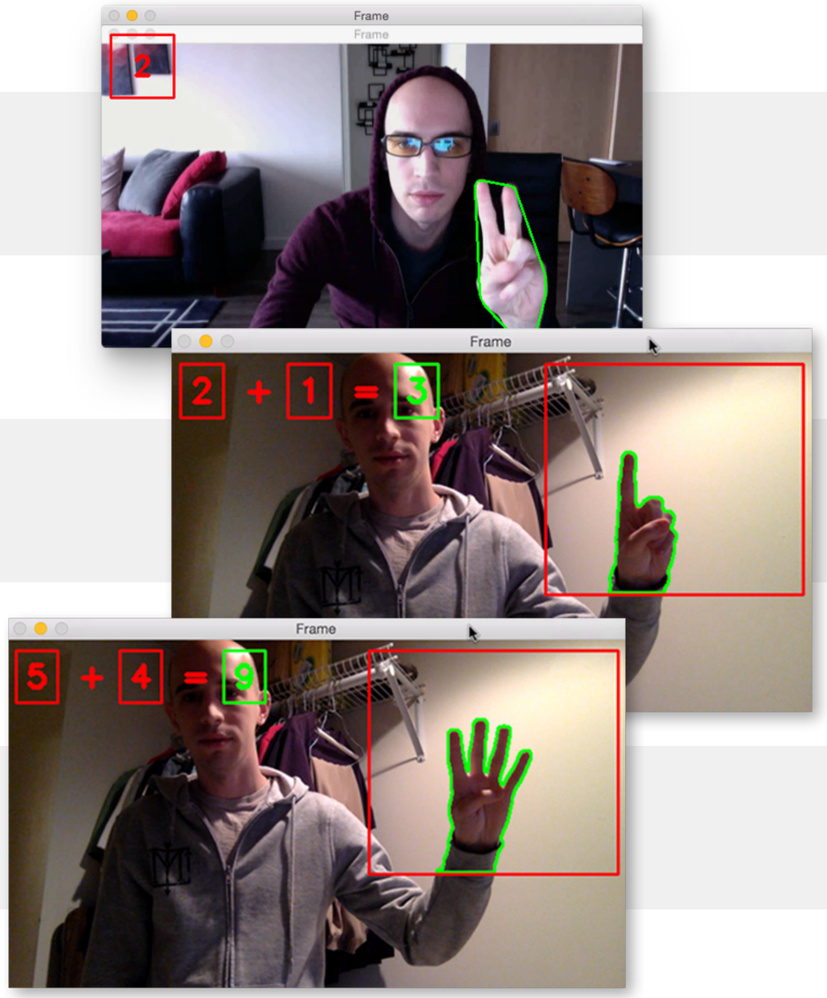
12.1	Introduction to PhoneGap
12.2	Overview of PhoneGap
12.3	PhoneGap environment setup
12.4	PhoneGap “Hello, World”
12.5	PhoneGap UI Setup
12.6	Capturing and uploading a photo with PhoneGap
12.7	Displaying face detection results

Hand Gesture Recognition

13.1 Introduction to hand gesture recognition

13.2 Hand, finger, and motion segmentation

13.3 Recognizing gestures



As you can see, PyImageSearch Gurus is the most *comprehensive*, *in-depth*, *and easy-to-follow* computer vision course online.

But don't take my word for it.

"I cannot say it enough: ***PyImageSearch Gurus is amazing.*** *I really enjoy myself and the way you set everything up (blog, course, community, incredible response time). It tells a lot about how much you enjoy it too."* — Claude Cavelius

"During the last few weeks, I had the opportunity to collaborate in a truly challenging, interesting project involving Computer Vision (CV) and Natural Language Processing (NLP). The CV part is now deployed and fully functional. I just wanted to tell you: ***THANK YOU. Without your course, I would have never been able to complete the project.*** *Your course is the best content vs. value combination I have come across in ages."* — Javier Rodriguez Zaurin

"Your course is awesome. I've been working through the lessons and trying the sample code with additional images. Your explanations are very concise and well-thought out. ***I'm most impressed by the way the lessons have seamlessly flowed together.*** *Adrian, I think you've really got a skill for keeping students focused on what's essential."* — John Stocking

The PyImageSearch Gurus course has clearly helped these developers, researchers, and students master computer vision — *so what about you?*

Are you ready to take the *next step* in your journey to become a computer vision master and join the PyImageSearch Gurus course?

I believe you are.

I know you can do it.

And I'll be there to help you out every step of the way.

Click here to join PyImageSearch Gurus.

I'll see you inside the course.