

# Machine Perception CIS 580 Spring 2012

Grading Policy: Homeworks 50%, Midterm 20%, Final 30%

Homeworks on paper and using Matlab.

Midterm is on paper.

Final is a project including paper calculations and Matlab.

Resources:

Szeliski's book

<http://research.microsoft.com/en-us/um/people/szeliski/Book/>

H. Farid, [http://www.cs.dartmouth.edu/farid/Hany\\_Farid/Tutorials/Entries/2011/6/3\\_Fundamentals\\_of\\_image\\_Processing.html](http://www.cs.dartmouth.edu/farid/Hany_Farid/Tutorials/Entries/2011/6/3_Fundamentals_of_image_Processing.html)

Zisserman and Hartley, Multiple View Geometry



Castleman, Digital Image Processing

# Machine Perception: in this course only vision => computer vision

Main journals of the field:

- IEEE Pattern Analysis Machine Intelligence (PAMI)
- Int. Journal of Computer Vision (IJCV)
- CVIU, IVC, PR, PRL,...

Main conferences of the field:

- IEEE Computer Vision Pattern Recognition
- IEEE Int. Conf. Computer Vision
- European Conference Computer Vision

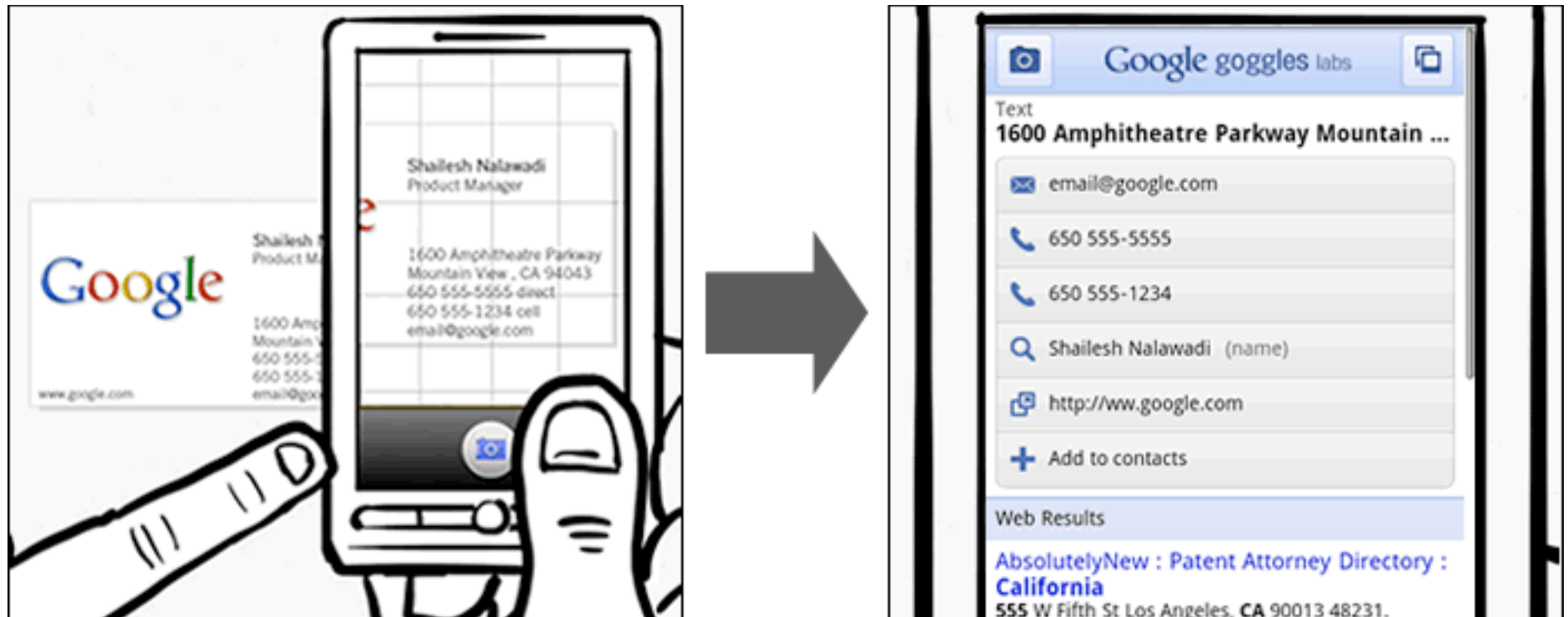
Graphics and Robotics are the nearest fields, great vision papers at SIGGRAPH as well as at ICRA and Trans. Robotics or IJRR.



# Applications: JPEG-MPEG compression

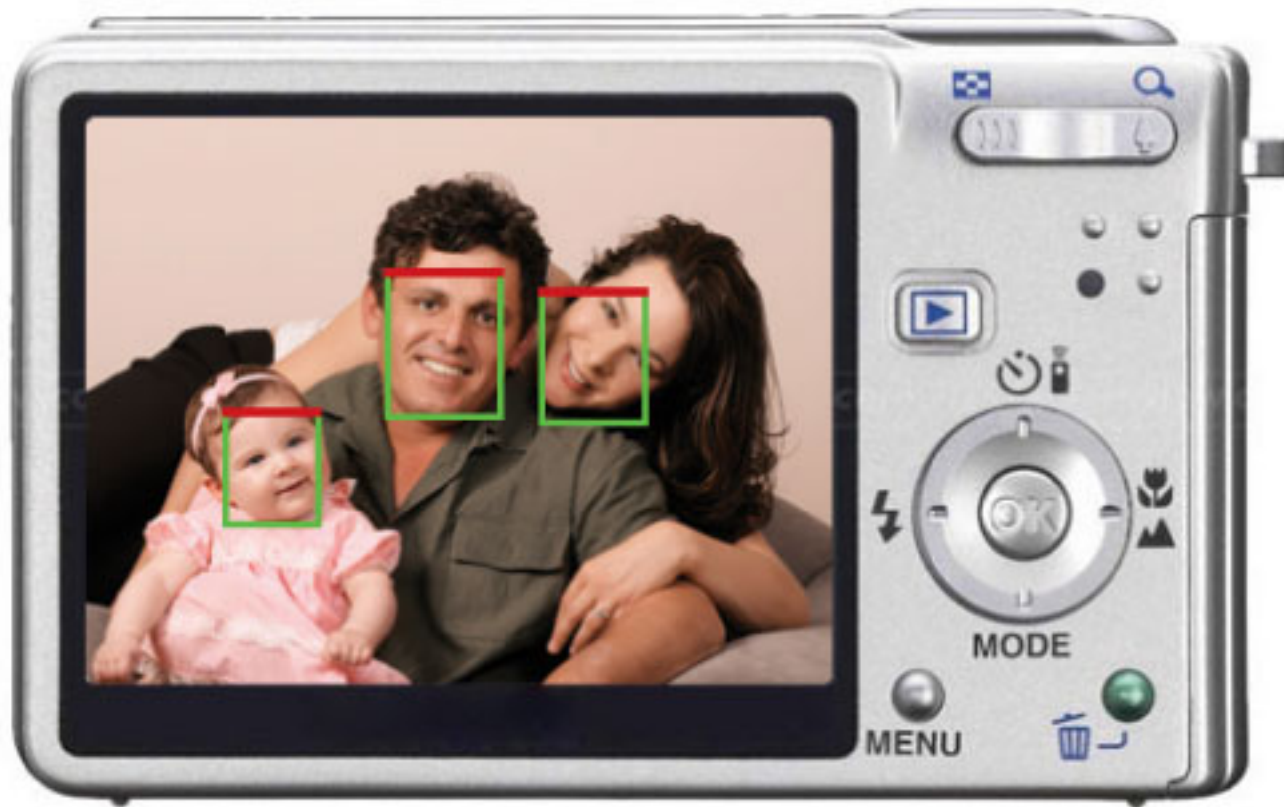


# OCR

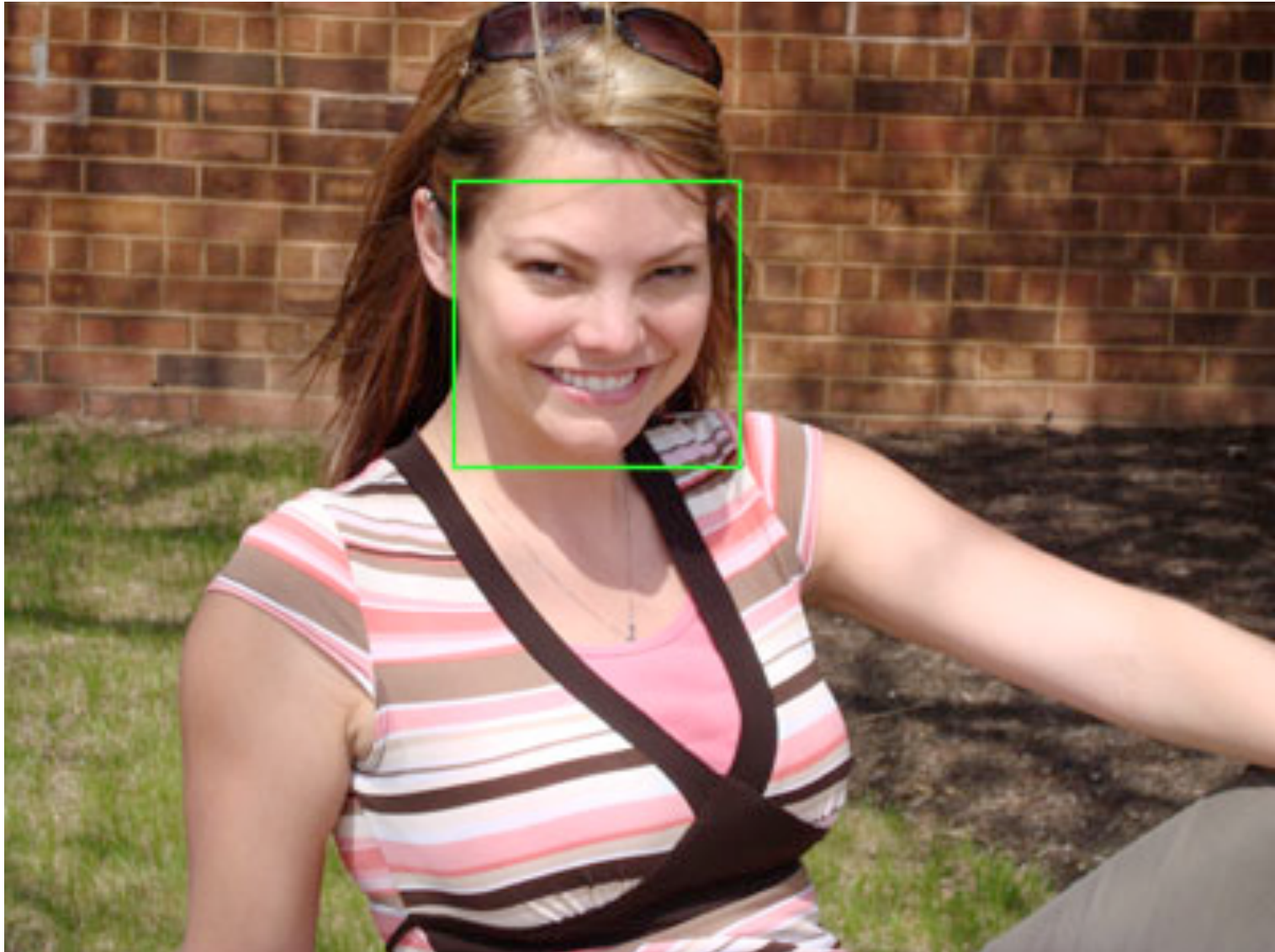




# Face detection inside millions of cameras



# Smile detection in cameras



# Panoramic stitching

In all photo-management systems (here photoshop)





# Object removal in photo editors



# Videosurf.com

Beta Feedback | Discover By Character | Log In

VIDEOSURF BETA

Search: Madoff [Save Search to My Homepage]

Filter By

Search Results: **Madoff** Displaying 1 to 15 of 757 matches

Refine Results:

Content Type (757)  
[x] Slideshows (56)  
[x] OtherClips (699)  
Select All

Categories (203)  
[x] News (194)  
[x] Funny (2)  
[x] Music (2)  
[x] TV (2)  
Select All [more]

Video Sources (757)  
[x] YouTube (250)  
[x] MSN Video (162)  
[x] Yahoo! News (75)  
[x] MSNBC (53)  
[x] Dailymotion (42)  
[x] CNN Video (31)  
[x] ROO TV (27)  
[x] Voxant Newsroom (23)  
[x] ABC News (23)  
[x] FOX News (19)  
[x] Google Video (10)  
[x] CBS 5 (10)  
[x] Revver (9)  
[x] Metacafe (6)  
[x] CBS News (6)  
[x] MySpace TV (4)  
[x] blip.tv (4)  
[x] hulu (2)  
[x] Comedy Central (1)  
Select All

Show Only Faces: ☐

Sort by: Relevance Added: All Time View: Summary

**Video: Why isn't Madoff behind bars?**  
Jan. 13: TODAY's Matt Lauer talks to NBC's chief legal analyst, Dan Abrams, about why Bernie Madoff has been allowed to stay in his Manhattan penthouse while he awaits trial for allegedly running a giant Ponzi scheme. (Today Show)  
00:00 00:02 00:04 00:08 00:20 00:27 00:42 00:47 00:48 01:02 01:06 01:23 01:26 01:34 01:38 01:38 01:43 01:47 01:48 01:55  
Best All Show Only Faces: ☐  
Favorite No Rating  
MSNBC Views: — Time: 1:56 Added: 1 day ago

**Video: Financier Madoff stays out of jail**  
Jan. 13: A judge is allowing accused swindler Bernie Madoff to remain under house arrest in his Manhattan penthouse pending a trial on charges that he ran a \$50 billion Ponzi scheme. CNBC's Erin Burnett reports. (Today Show)  
00:06 00:17 00:38 00:42 00:47 00:55 00:59 01:00 01:06 01:14 01:26 01:32 01:38 01:45 01:52 02:00 02:02 02:05 02:20 02:35  
Best All Show Only Faces: ☐  
Favorite No Rating  
MSNBC Views: — Time: 2:55 Added: 1 day ago

**Madoff Still A Free Man**  
A NY judge allowed Bernard Madoff to remain under house arrest after rejecting an attempt by prosecutors to jail him for attempting to send money to his friends and family. Randall Pinkston reports.  
00:04 00:09 00:12 00:14 00:16 00:17 00:24 00:29 00:34 00:37 00:42 00:48 00:48 00:55 01:01 01:15 01:19 01:20 01:33 01:37  
Best All Show Only Faces: ☐  
Favorite No Rating  
Voxant Newsroom Views: — Time: 1:40 Added: 1 day ago

**Video: Bernie Madoff gets a break**  
Jan. 12: Accused swindler Bernie Madoff remained confined to his apartment on bail after a judge decided not to jail him Monday. CNBC's Trish Regan reports. (Nightly News)  
00:01 00:14 00:17 00:18 00:25 00:33 00:41 00:43 00:46 00:46 00:55 01:00 01:10 01:13 01:14 01:17 01:21 01:23 01:26 01:57  
Best All Show Only Faces: ☐  
Favorite No Rating  
MSNBC Views: — Time: 2:08 Added: 1 day ago

**Video: Madoff remains on bail**  
Jan. 12: A judge has ruled that Bernard Madoff will remain free on bail, pending trial on alleged investment fraud. A CNBC panel, and Madoff investor discuss. (CNBC)  
00:13 00:24 00:31 00:43 01:34 01:52 02:10 02:39 02:58 03:05 03:09 03:12 03:40 03:42 03:45 03:51 04:00 04:13 04:19 04:32  
Best All Show Only Faces: ☐  
Favorite No Rating  
MSNBC Views: — Time: 4:34 Added: 1 day ago

**Madoff's Still Free, New Bail Restrictions**  
FOXBusiness.com's Dunstan Prial on NYC judge's ruling to allow Madoff to remain under house arrest with new, stricter bail conditions.  
00:01 00:07 00:15 00:19 00:33 00:41 00:43 00:55 01:05 01:24 01:27 01:30 01:32 01:37 01:41 01:43 01:48 01:53 01:56 01:58  
Best All Show Only Faces: ☐  
Favorite No Rating  
Yahoo! News Views: — Time: 2:03 Added: 1 day ago




# taaz.com

# TAAZ

REGISTER | SIGN IN

CREATE MAKEOVER | UPLOAD PHOTO | PHOTO GALLERY | BEAUTY CENTRAL

## Online Makeover



Create a gorgeous new look. Be your own virtual hairstylist and makeup artist.

Upload photo to try on true-to-life makeup - eyeshadow, mascara, lipstick ...

Try new hairstyles to complement your face shape - easily change hair color. Add highlights or lowlights.


Start Makeover ▶

### What's New

JAN 2009

#### Celebrity Lookalike Contest


Makeover yourself to look like a celebrity and win \$500.



ENTER NOW ▶

## Beauty Central

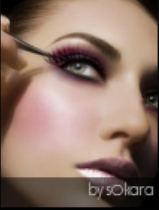
Daily tips and ideas on makeup and style




Ashlee Simpson Hair

More Articles ▶

## Photo Gallery



by solara



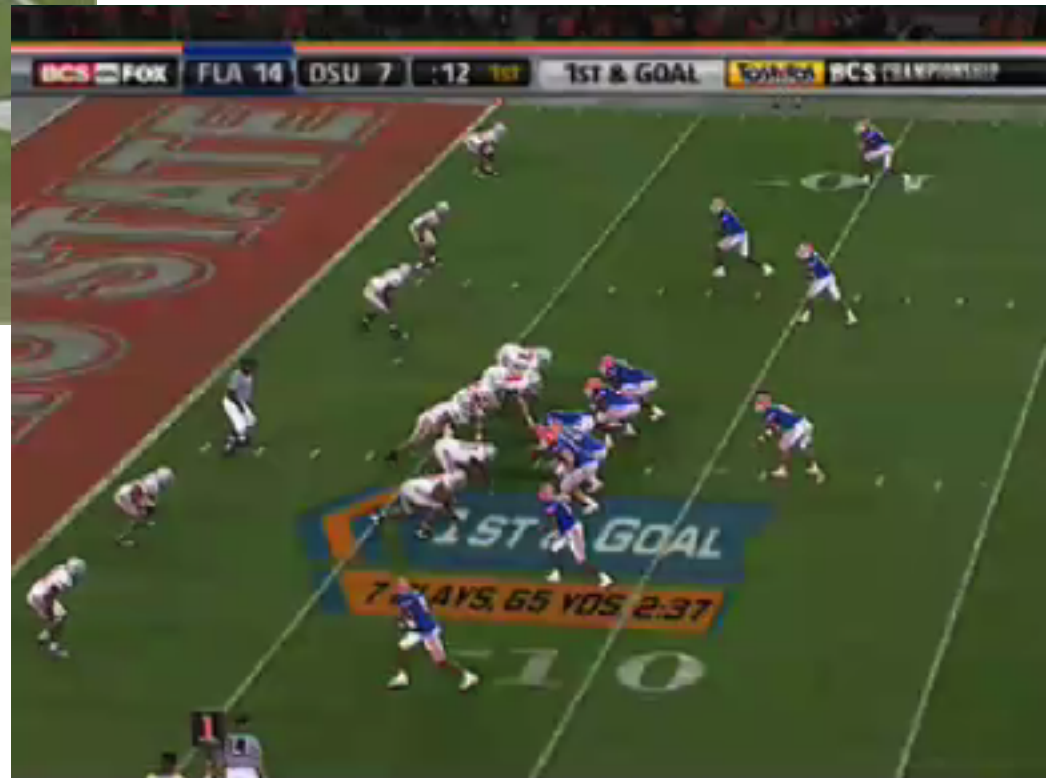
by camisoup1

View And Vote On Today's Makeovers

VOTE Best Makeovers ▶



# Virtual Yellow Line and Billboards



# Sportsvision.com: Tracking and annotating





# Tracking and replacing images: Imagineer



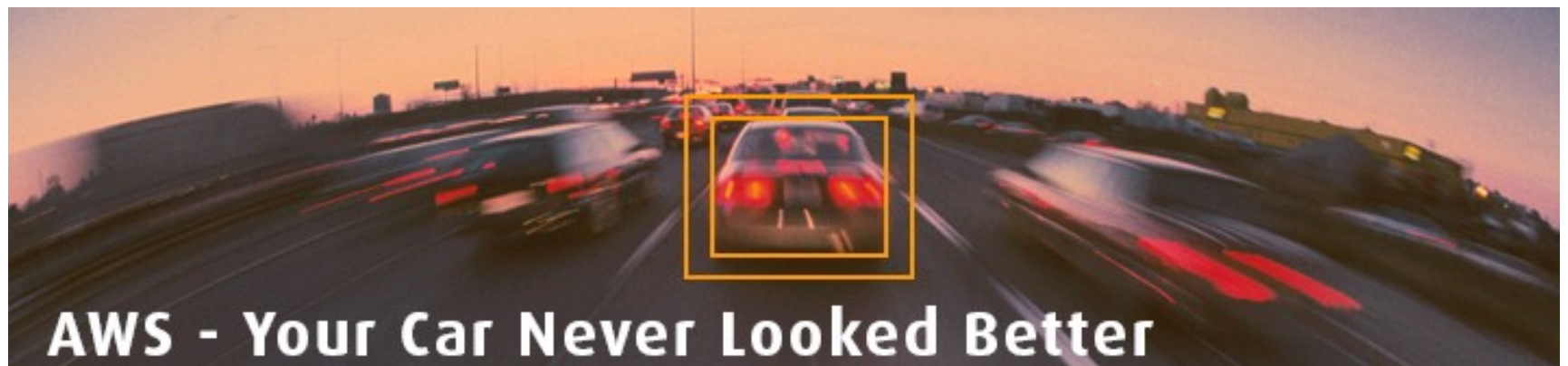
# Evoretail.com



Bottom of the cart and top of the cart detection!

# MobileEye

- Lane Departure Warning (BMW 5' series)
- Forward Collision System (2.7 sec ahead)
- Headway monitoring and Warning
- Off-road path finding



# Surveillance



# Microsoft Photosynth

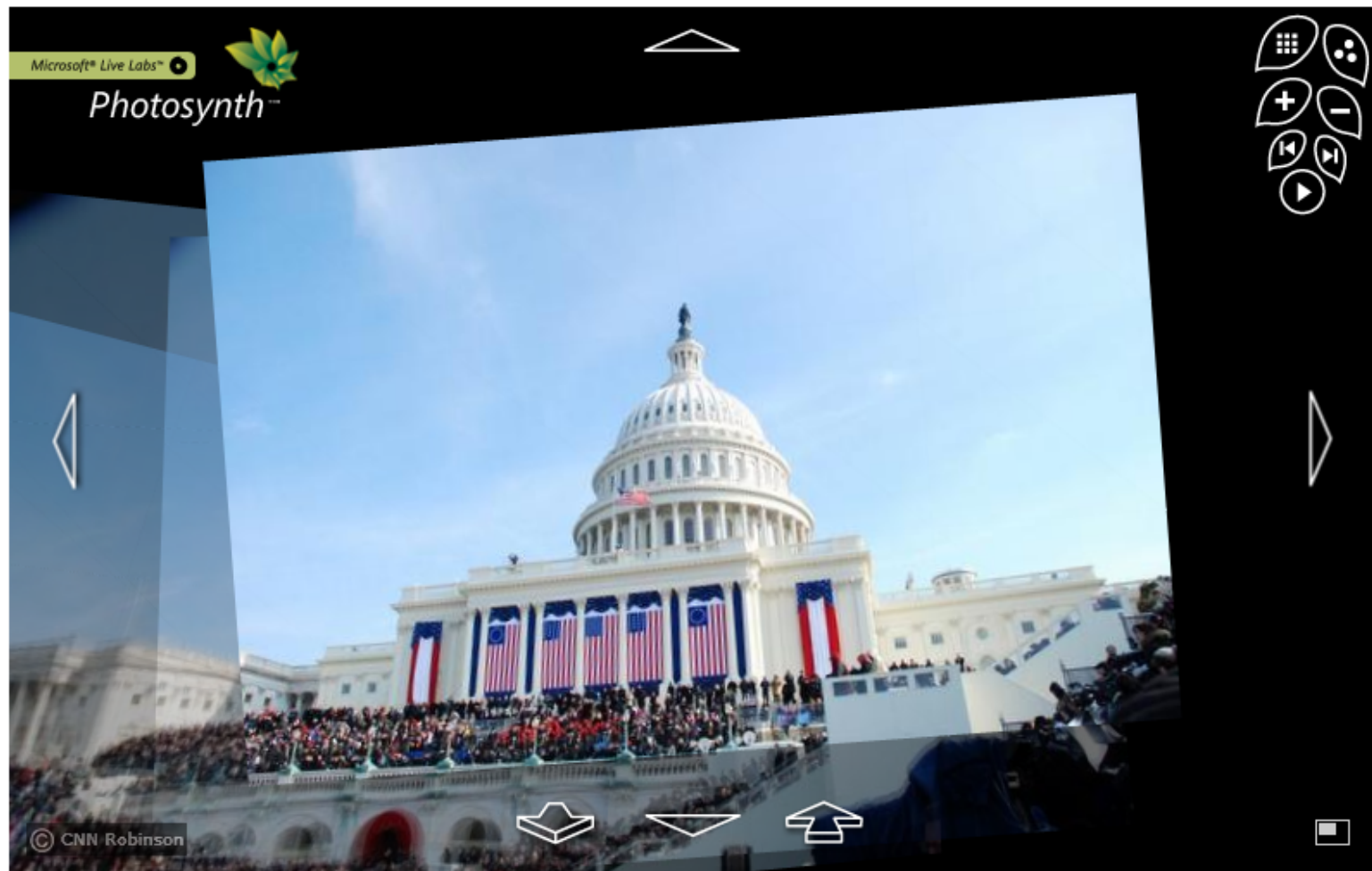
## The 44<sup>th</sup> President **Inauguration**

Transition to Power

**Inauguration**

First 100 days

**Inauguration** » **The Moment** | Submit your pictures to [themoment@cnn.com](mailto:themoment@cnn.com) to have them added to the Photosynth






# like.com (now boutiques.com at Google): image search for products

Given an image query of a product, find the closest products in shape, color, pattern.

Like.com is a visual search engine that lets you find items by color, shape, and pattern.

Your Search Item

Which part of the image do you like?  
Draw a box on the item to focus your search on that area.

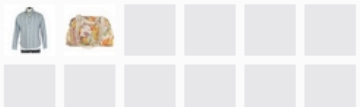


**Kathy Van Zeeland - Bling It On Satchel (Oyster)** - Handbags  
\$82.95  
[More Details](#) + [Save to LikeList](#)  
[Shop at Zappos](#)

Which Aspect of this Item is Most Important?


Color    Shape    Pattern

My LikeList




### Search Results


Sort By [Likeness<sup>SM</sup>](#) [Price](#)    Change Your View: [Grid](#) [List](#)    Results 1 - 20 of 25,554    1 2 3 4 5 6 7 [NEXT >>](#)




**Kathy Van Zeeland - Bling It On Satchel (Oyster)** - Handbags  
zappos.com is proud to offer the kathy van zeeland - bling it on satchel (oyster) - handbags: satchel style shoulder bag made of synthetic leather or fabric. croco embossed synt...  
[FREE SHIPPING AVAILABLE!](#) [More Details](#) + [Save to LikeList](#)  
[Shop at Zappos](#)  
Shop for more items like this:  
[Likeness Search](#)



**The Sak Handbags - Crosstown Satchel (Light Multi)** - Handbags  
zappos.com is proud to offer the the sak handbags - crosstown satchel (light multi) - handbags: sophisticated and stylish dome style satchel made of woven fabric with leather tr...  
[FREE SHIPPING AVAILABLE!](#) [More Details](#) + [Save to LikeList](#)  
[Shop at Zappos](#)  
Shop for more items like this:  
[Likeness Search](#)



**Kathy Van Zeeland - City Slickers Croco Chain Stachel (Natural)** - Handbags  
zappos.com is proud to offer the kathy van zeeland - city slickers croco chain stachel (natural) - handbags: with this sexy satchel style shoulder bag, don't even try to cou...  
[FREE SHIPPING AVAILABLE!](#) [More Details](#) + [Save to LikeList](#)  
[Shop at Zappos](#)  
Shop for more items like this:  
[Likeness Search](#)



**Kathy Van Zeeland - Crowning Glory Large Satchel (Metallic Bone)** - Handbags  
zappos.com is proud to offer the kathy van zeeland - crowning glory large satchel (metallic bone) - handbags: this chic satchel may just turn out to be the "crowning glory&...  
[FREE SHIPPING AVAILABLE!](#) [More Details](#) + [Save to LikeList](#)  
[Shop at Zappos](#)  
Shop for more items like this:  
[Likeness Search](#)

# Google Image Similarity



400 x 400 - 25k - jpg  
media.lvrj.com



240 x 240 - 16k - jpg  
static.flickr.com  
[Similar images](#)



239 x 240 - 11k - jpg  
images.teamsugar.com  
[Similar images](#)



438 x 450 - 21k - jpg  
open.az  
[Similar images](#)



275 x 275 - 13k - jpg  
4.bp.blogspot.com  
[Similar images](#)  
Related: [red pumps](#)



500 x 500 - 47k - jpg  
static.flickr.com  
[Similar images](#)



342 x 351 - 20k - jpg  
freedomblogging.com  
[Similar images](#)



275 x 275 - 14k - jpg  
www.shoecapital.com  
[Similar images](#)



275 x 275 - 12k - jpg  
www.shoeblog.com  
[Similar images](#)



150 x 150 - 14k - jpg  
www.freeafterfive.com  
[Similar images](#)



172 x 169 - 7k - jpg  
2.bp.blogspot.com  
[Similar images](#)



400 x 391 - 95k - png  
images.teamsugar.com  
[Similar images](#)



320 x 320 - 13k - jpg  
bp0.blogger.com  
[Similar images](#)



275 x 275 - 17k - jpg  
files.wordpress.com  
[Similar images](#)



240 x 323 - 9k - jpg  
www.marieclaire.co.uk  
[Similar images](#)



275 x 275 - 14k - jpg  
fashiony.ru  
[Similar images](#)



500 x 500 - 48k - jpg  
typepad.com  
[Similar images](#)



275 x 275 - 11k - jpg  
4.bp.blogspot.com  
[Similar images](#)



275 x 275 - 11k - jpg  
saksfifthavenue.com  
[Similar images](#)



640 x 568 - 42k - jpg  
photoway.in.ua  
[Similar images](#)



470 x 348 - 15k - jpg  
blogga.ru  
[Similar images](#)

# Google Goggles, Snaptell and others





# Primesense and Kinect



## And more applications in...

David Lowe' s

Computer Vision Industry Compendium

<http://www.cs.ubc.ca/spider/lowe/vision.html>

