

Physical Security in a Networked World

Video Surveillance, Video Analytics, and You.

Joshua A. Marpet

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Joshua Marpet

Who is this guy?

Josh has done everything. I've been a cop, an Infragard/OWASP/HTCIA/FLEA and ASTM member, a volunteer fireman, a blacksmith and a horse dentist. No joke.

My passion is the chasm between Information Security and Physical Security. What people don't realize is that there is no difference. Locks are locks. I can pick some, and perform SQL injection on others. So what if one's on a web page, and one's on a door?

I love breaking into places, and showing the people who "secured" it, how to fix the problem.

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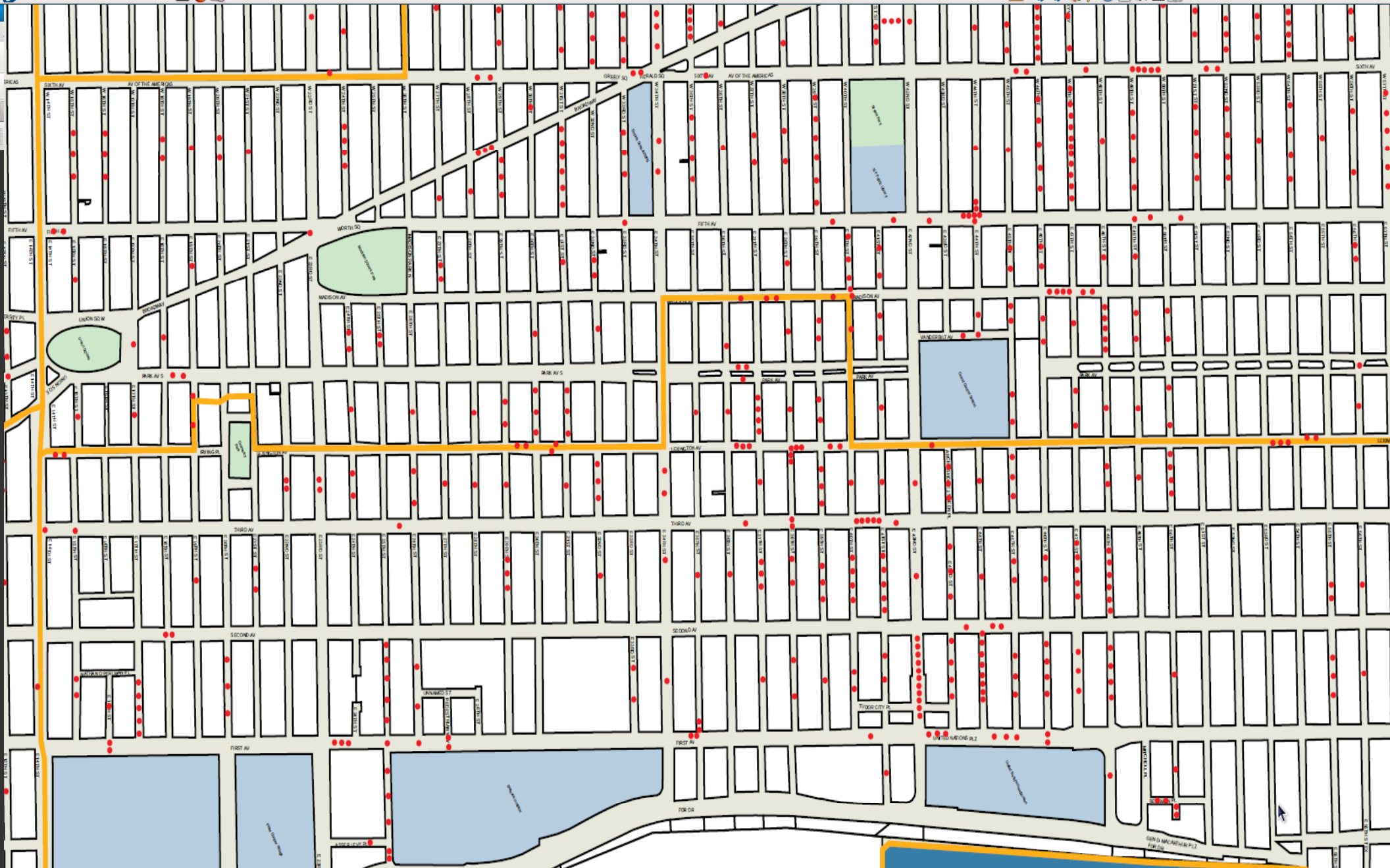
Video Surveillance

- Prevalence – How often does a camera look at me every day?
- Legality – When can someone record me?
- Hackability
 - Camera Hacks
 - Video System Hacks
- Compression Schemas
- Video Seizure Lessons
- CSI – Why I hate the show



FAIL

Prevalence



Font Size - +

- Home
- Links & Numbers
- Video Library
- Bloggers
- Station Info.
- Program Schedule
- News Team
- Stay Connected
- CBS 2 Real Estate

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- Health News
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Jan 6, 2010 8:18 am US/Eastern

Comedy Of Errors: Cameras Didn't Work At Newark

Sources Tell CBS 2 That TSA Surveillance Cameras Were Inoperable At Time Of Terminal C Security Breach

TSA Apparently Didn't Know Number For Continental To Get Other Footage

[CBS News Interactive: Eye On Air Safety](#)



Reporting
[Marcia Kramer](#)

NEWARK (CBS) — It's a tale of shocking ineptitude: CBS 2 has learned a series of missteps unnecessarily added to the mayhem at Newark Liberty International Airport on Sunday. The six-hour delay stranded thousands of people, creating extreme crowding and chaos.

The mistakes made at the airport give new meaning to the term "domino effect." It was a cascading series of missteps that cry out for action.

The sign at the Transportation Security Administration screening post at Newark read: "Premises Under Constant Video Surveillance."

What is should add is: 'If We're Lucky.'



◀ 1 of 1 ▶

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Thousands of people found themselves bunched together inside Newark Liberty International Airport after a security breach prompted the closing of a terminal for several hours Jan. 3, 2010. CBS

Related Slideshows

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Legality



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IPHONE APPS DIRECTORY

New York, 8:57 PM
Fri Jan 29
61 posts in the last 24 hours
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Dell Tech Support Remotely Turns Woman's Webcam On Without Permission



Dianne Annunziato is accusing a Dell technician of becoming a virtual peeping Tom during a support call by remotely turning on her webcam.

By Sean Fallon

Jan 26, 2010 04:40 PM 51,944 183

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Police fight cellphone recordings

Witnesses taking audio of officers arrested, charged with illegal surveillance

By [Daniel Rowinski](#)

New England Center For Investigative Reporting / January 12, 2010

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Simon Glik, a lawyer, was walking down Tremont Street in Boston when he saw three police officers struggling to extract a plastic bag from a teenager's mouth. Thinking their force seemed excessive for a drug arrest, Glik pulled out his cellphone and began recording.

Within minutes, Glik said, he was in handcuffs.



Discuss

COMMENTS (291)

"One of the officers asked me whether my phone had audio recording capabilities," Glik, 33, said recently of the incident, which took place in October

2007. Glik acknowledged that it did, and then, he said, "my phone was seized, and I was arrested."

The charge? Illegal electronic surveillance.

Jon Surmacz, 34, experienced a similar situation. Thinking that Boston police officers were unnecessarily rough while breaking up a holiday party in Brighton he was attending in December 2008, he took out his cellphone and began recording.

Police confronted Surmacz, a webmaster at Boston University. He was arrested and, like Glik, charged with illegal surveillance.

There are no hard statistics for video recording arrests. But the experiences of Surmacz and Glik highlight what civil libertarians call a troubling misuse of the state's wiretapping law to stifle the kind of street-level oversight that cellphone and video technology make possible.

"The police apparently do not want witnesses to what they do in public," said Sarah Wunsch, a staff attorney with the American Civil Liberties Union of Massachusetts, who helped to get the criminal charges against Surmacz dismissed.

Hackability

Nanny-Cam May Leave a Home Exposed

Sat Apr 13, 2:55 PM ET

By JOHN SCHWARTZ The New York Times

Thousands of people who have installed a popular wireless video camera, intending to increase the security of their homes and offices, have instead unknowingly opened a window on their activities to anyone equipped with a cheap receiver.

The wireless video camera, which is heavily advertised on the Internet, is intended to send its video signal to a nearby base station, allowing it to be viewed on a computer or a television. But its signal can be intercepted from more than a quarter-mile away by off-the-shelf electronic equipment costing less than \$250.

Compression Schemas

H.264 / MPEG-4 AVC

Overview

H.264 is also known as MPEG-4 AVC. H.264 uses the latest innovations in video compression technology to provide consistently crisp and clear video for the best possible viewing.

Pros

- * H.264 delivers incredible video quality at data rates one-fourth to one-half the size of previous video formats

- * H.264 offers dramatically lower bit rates and better picture quality than MPEG-2, MPEG-4 or H.263+

- * It is 2X times more efficient than MPEG-4. and file size is 3X times smaller than comparable MPEG-2 Codecs

- * It is easy to integrate and covers wide range of picture format. Hence used in large application segment.

Cons

- * H.264 requires longer encoding time

- * It is certainly not constricted and low-bandwidth friendly

- * More Hardware overhead is also one of the limiting factor

- * Licensing agreements are complicated.

MPEG-4

Overview

MPEG-4 is a standard currently under development for the delivery of interactive multimedia across networks. As such, it is more than a single codec, and will include specifications for audio, video, and interactivity.

Pros

- * Good image quality at low data rates

Cons

- * Standard is still being designed

Video Surveillance Seizure Lessons:

Lesson 1: When involved in an incident likely to go to court, get out there with a lawyer within 3 days to collect video to support your side of the lawsuit.

Lesson 2:

Get a court order/subpeona for the footage. This gives a business or person legal liability mitigation.

Lesson 3:

Take a picture of the clock on the video system, with a clock that is atomic synchronized..

Lesson 4:

Make sure you get a copy of the player program.

Lesson 5:

The CSI Effect is real. The CSI Science is not, mostly.

YEEAAAHH



Video analytics

Reliability – Is it Consistent?

Validity – Does it alarm for the correct conditions?

Implementation – How do I get this?

Hacking – How do I break it?



What is Video Analytics?

Interpretation of a video stream, done either in real time, or performed on a recorded stream.

There are different types of Video Analytics, including:

Motion Detection

Facial Recognition

License Plate Recognition

Package Leave Behind

Line Crossing (“Trip-Wire Detection”)

People Counting

Incident Alerting

Motion/Trajectory Tracking

Currency Checking

Smoke and Fire Alerting

Photomanipulation – a type of Video analytics

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Page last updated at 21:20 GMT, Saturday, 16 January 2010

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Spanish MP's photo used for Osama Bin Laden poster



A photo of Bin Laden from 1998 (left) was digitally altered using elements from an image of Gaspar Llamazares (right)

A Spanish politician has said he was shocked to find out the FBI had used his photo for a digitally-altered image showing how Osama Bin Laden might look.

ADVE



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Mac on... new airport body scanners

By MAC
Last updated at 7:37 AM on 05th January 2010

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License Plate Recognition



Milestone XProtect Smart Client

Live Browse Setup New View (LPR + 2) Version 3.5a

Views

- Private
 - Agent VI
 - LPR
 - New View (LPR + 2)
- Shared

Sequences Alerts Time Navigation

4. december 2007 1.00x

12:57:58.866

Back Time Forward

Playback Slow Fast

Skip gaps during playback

04-12-2007 12:54:34 Go To

Audio Smart Search Print Export PTZ Control

Analytics LPR Evening

AnalyticsLPR	DR
Date: ti, dec 04, 2007 Time: 12:57:50 Confidence: 86,2%	54PS943
Date: ti, dec 04, 2007 Time: 12:57:51 Confidence: 84,3%	65UK711
Date: ti, dec 04, 2007 Time: 12:57:58 Confidence: 99,6%	46XT752
Date: ti, dec 04, 2007 Time: 12:58:00 Confidence: 65,3%	33TH733
Date: ti, dec 04, 2007 Time: 12:58:03 Confidence: 75,5%	75TR529
Date: ti, dec 04, 2007 Time: 12:58:07 Confidence: 87,5%	72HF245

Find License Plate

46XT752	Up	04-12-2007 12:57:58.863
	Down	04-12-2007 12:58:22.113

[AXIS 221 - Analytics] Camera 1 - 04-12-2007 12:57:58

04-12-2007 11:57:58.866

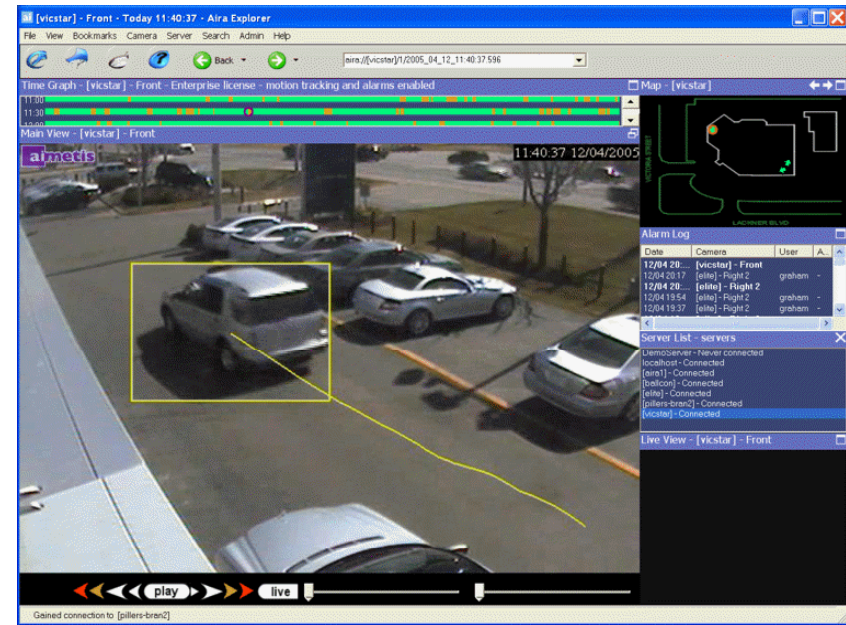
04-12-2007 13:57:58.866

Span

2 hours

Newest images at top

Trajectory



People Counting



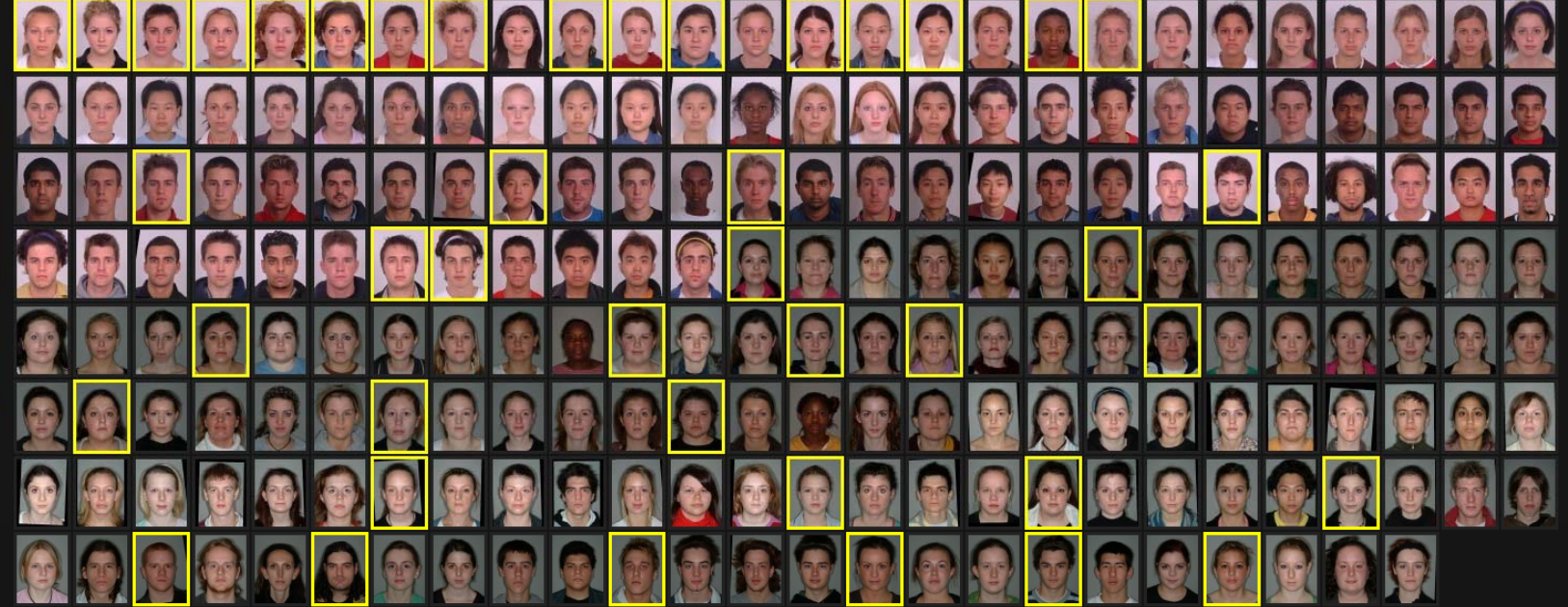
Line-Crossing "Tripwire"

Face Research » Demos » Make An Average

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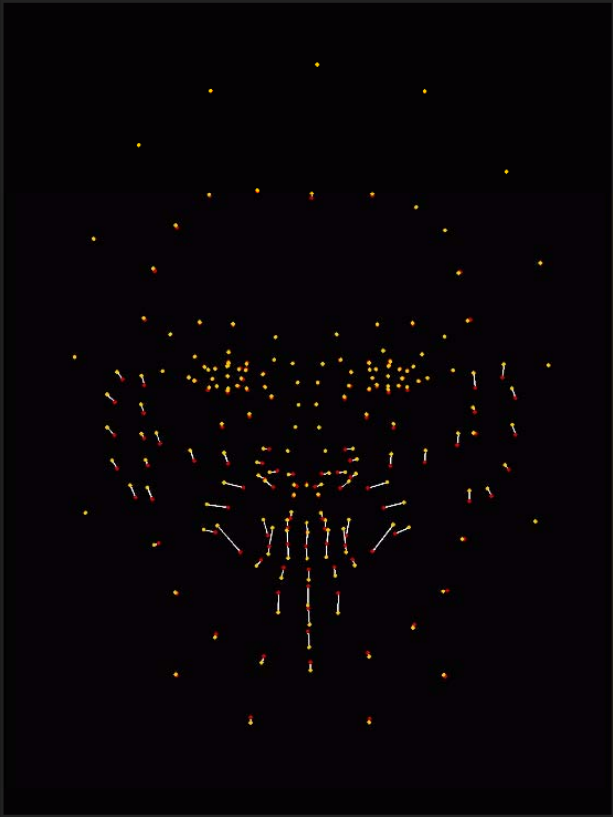
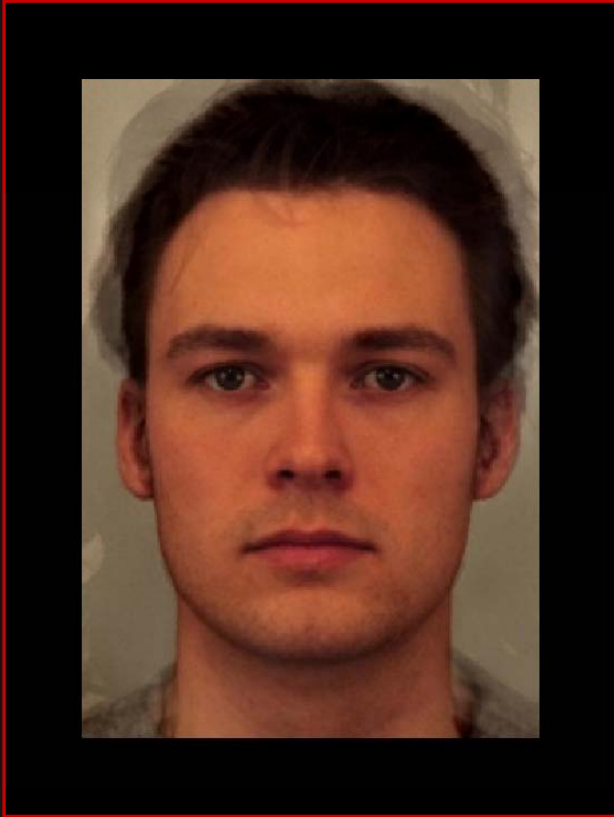
Learn about the computer graphic methods used to make average faces, scientific research on facial averageness or view a temporary gallery of the last few averages made. You can also average your own uploaded faces!

Average faces are deleted from the temporary gallery after 10 minutes, so please do not link to your creation.



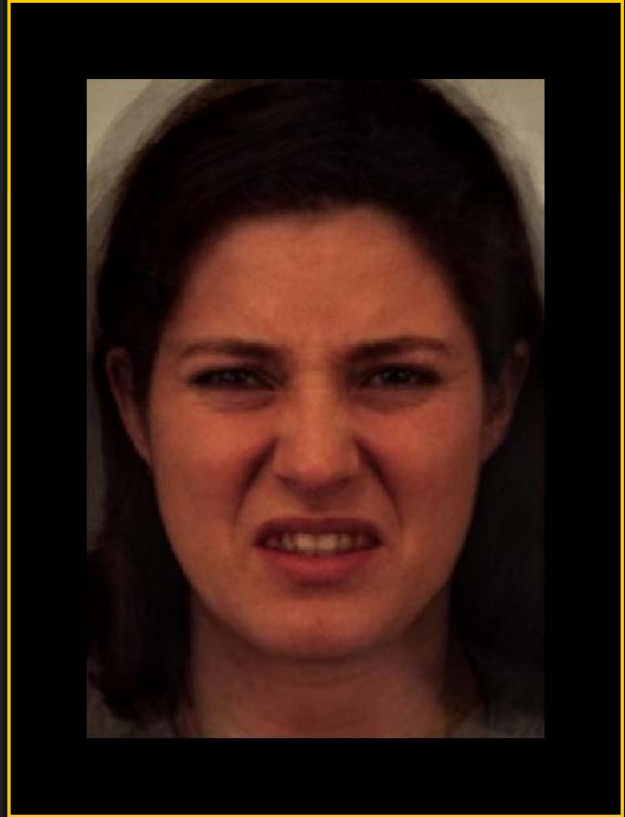
Start Image: East Asian Female
End Image: African Female

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Start Image: Neutral Male
End Image: Happy Male

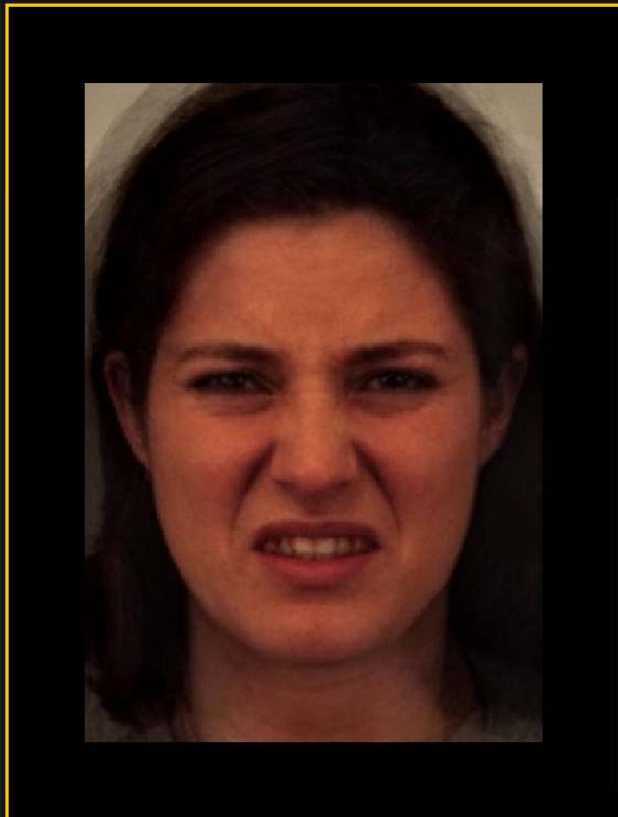
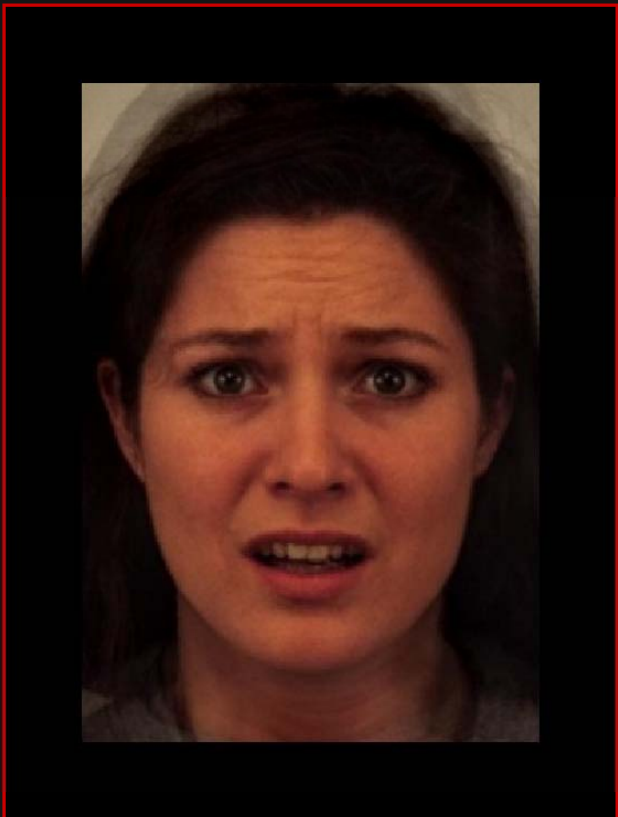
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Start Image:
End Image:

Show Advanced Options

Face Research » Demos » Vector



Start Image: Fearful Female
End Image: Disgusted Female

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Show Vector Reset

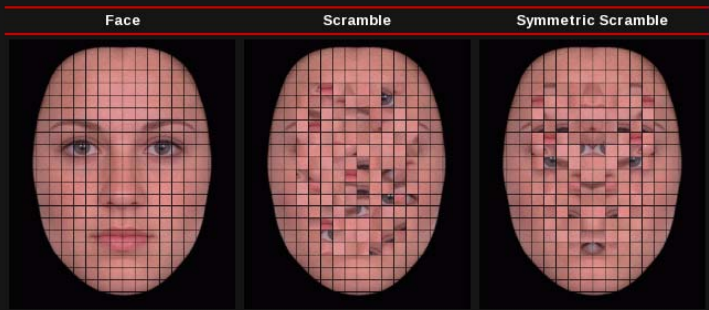
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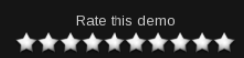
- [Female monkey](#)
- [Male monkey](#)
- [Female human](#)
- [Male human](#)
- [Averted Gaze](#)
- [Direct Gaze](#)

A new series of studies we are running in the lab is examining pupil responses to faces. We want to test if the pupil responds differently, by contracting and dilating, to human faces and also to macaque (a type of monkey) faces.

New! [Scramble Your Own Faces](#)



The pupil responds to changes in light in order for you to see in bright light or in darkness, so we have to control for any differences in light levels in the different types of faces. This way we can compare the pupil responses between faces and images that are not faces, but have some of the same visual properties as faces. We do this by scrambling the faces so that they retain all the same visual information (middle image). Since the face images we use are symmetrical, we also make the scrambled faces symmetrical (right image).

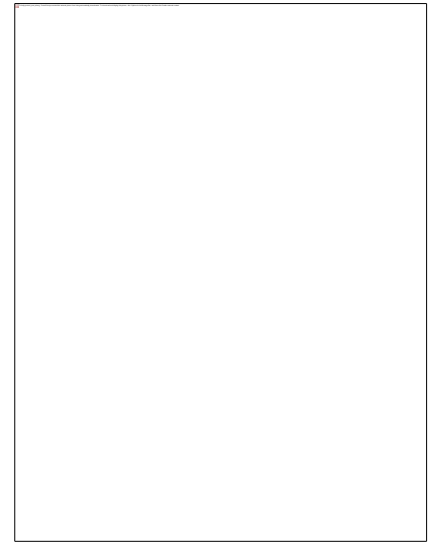


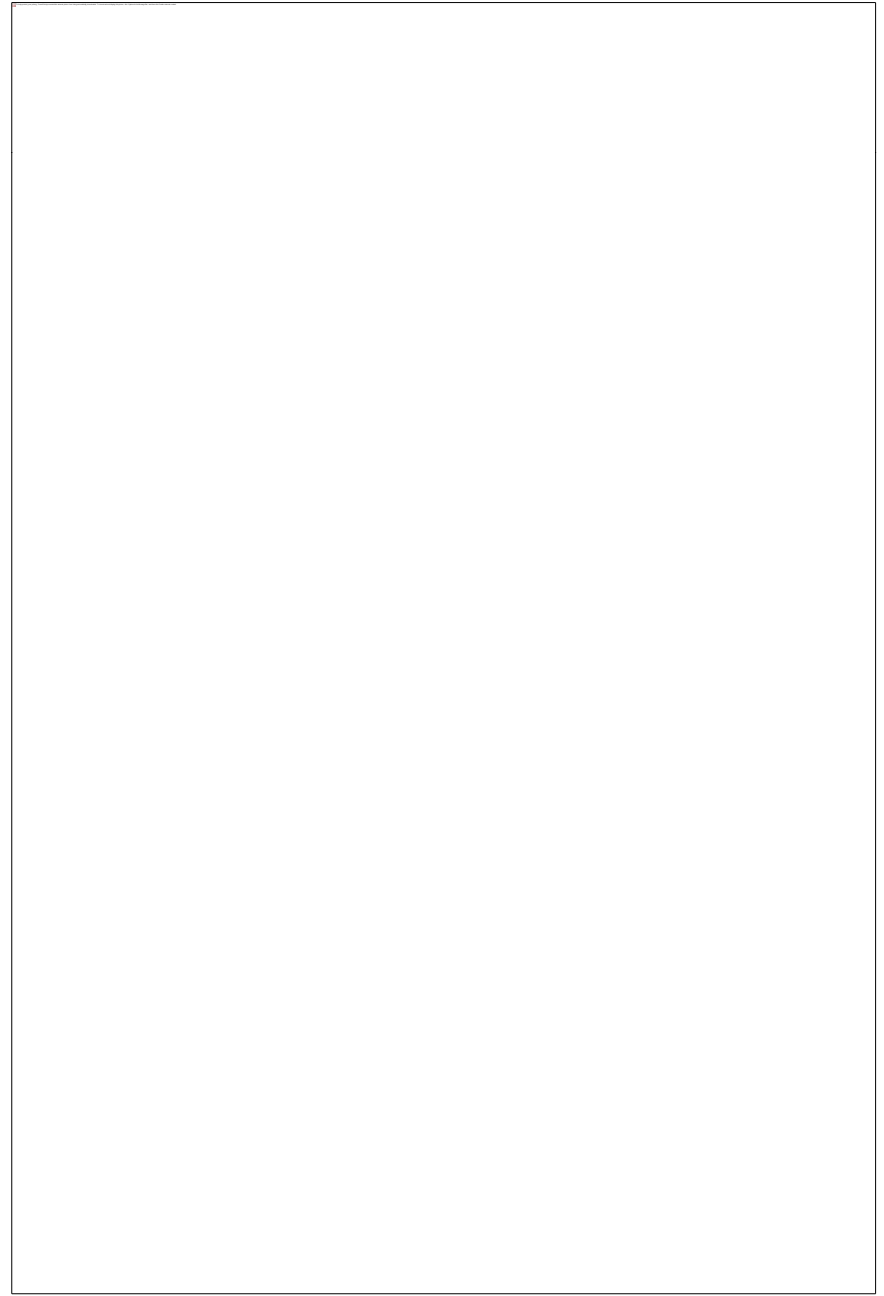
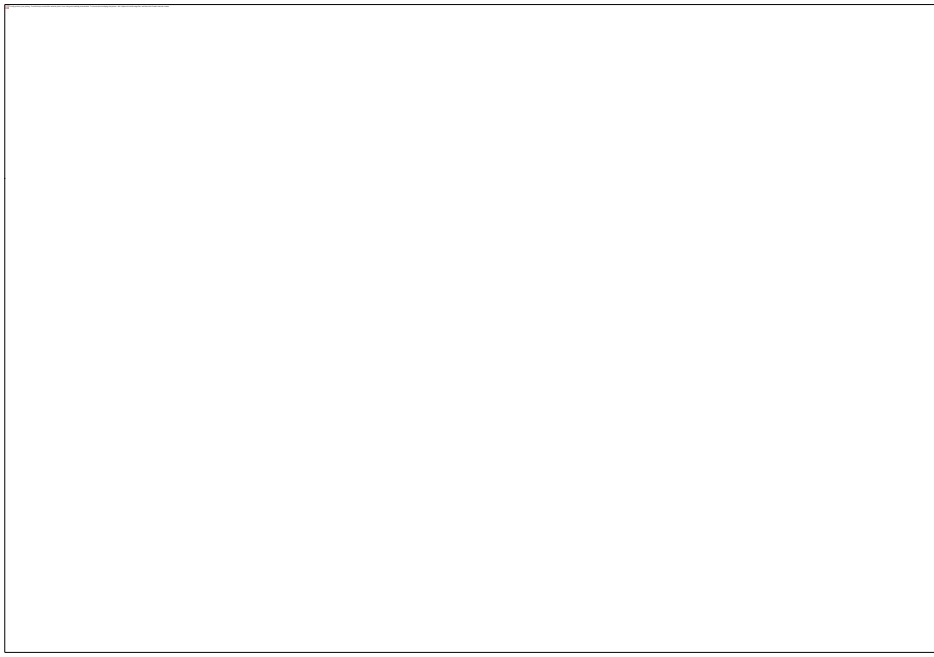
75,744 visitors since 17-01-07

Contact faceresearch@abdn.ac.uk with questions, comments and for more information.
Please do not email requesting stimuli. See our [FAQ](#).

Updated on 21-04-07

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Five Innovations That Will Change Cities in the Next Five Years

Written by [Adam Christensen](#) 

12/17/2009 10 comments

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Buildings that know when they need to be fixed before something breaks; sensors that tell the fire department details of a fire before they receive the emergency phone call; smart water and sewage systems that filter and recycle water...

1. Cities will have healthier Immune Systems
2. City Buildings will respond like living organisms.
4. Smarter Cities will quench cities thirst for water and save energy
5. Cities will respond to a crisis, even before receiving an emergency phone call.

Implementation

Problems

- Customers expect it to be a magic bullet, capable of spotting criminals and terrorists in a single bound. It's not.
- Integrators don't realize how much time and effort it takes to train the system.
- Total screwup of implementations is common.
- It's fairly sensitive technology, able to be avoided with a few simple steps.
- The consequences of adding Video Analytics to the corporate network are not foreseen.
- The consequences of adding Video Analytics to the corporate storage San are not foreseen.

Suggestions

- Have a manufacturer's representative go over the requirements with you, and sign off on them, that the Video Analytics system will perform to those specs.
- Use the manufacturer's rep to help with calibration and installation.
- Have clearly defined goals for the system.
- Use a manufacturer's demo system to show the client how the system works, and what it cannot do.
- Train at least one person at the client how to maintain and calibrate the system, so you don't get called out to do it many many many times.
- Demonstrate to the client, and have them sign off on the system, after that have tested it with their own people.

Video Analytics Hacking

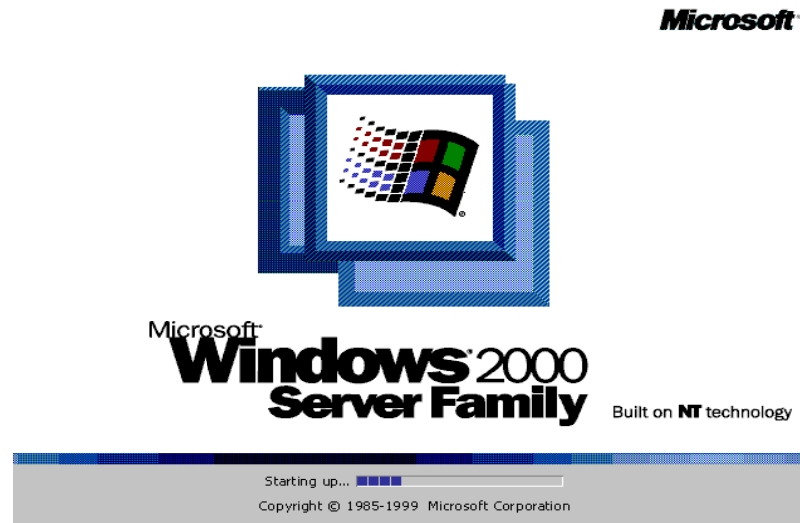
Non-Techie Hacks



Video Analytics Tech Hacks



Lots of Video servers run these OS'es, and all IP cameras have RJ-45, normally going straight to the Corporate Network



Conclusions?

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