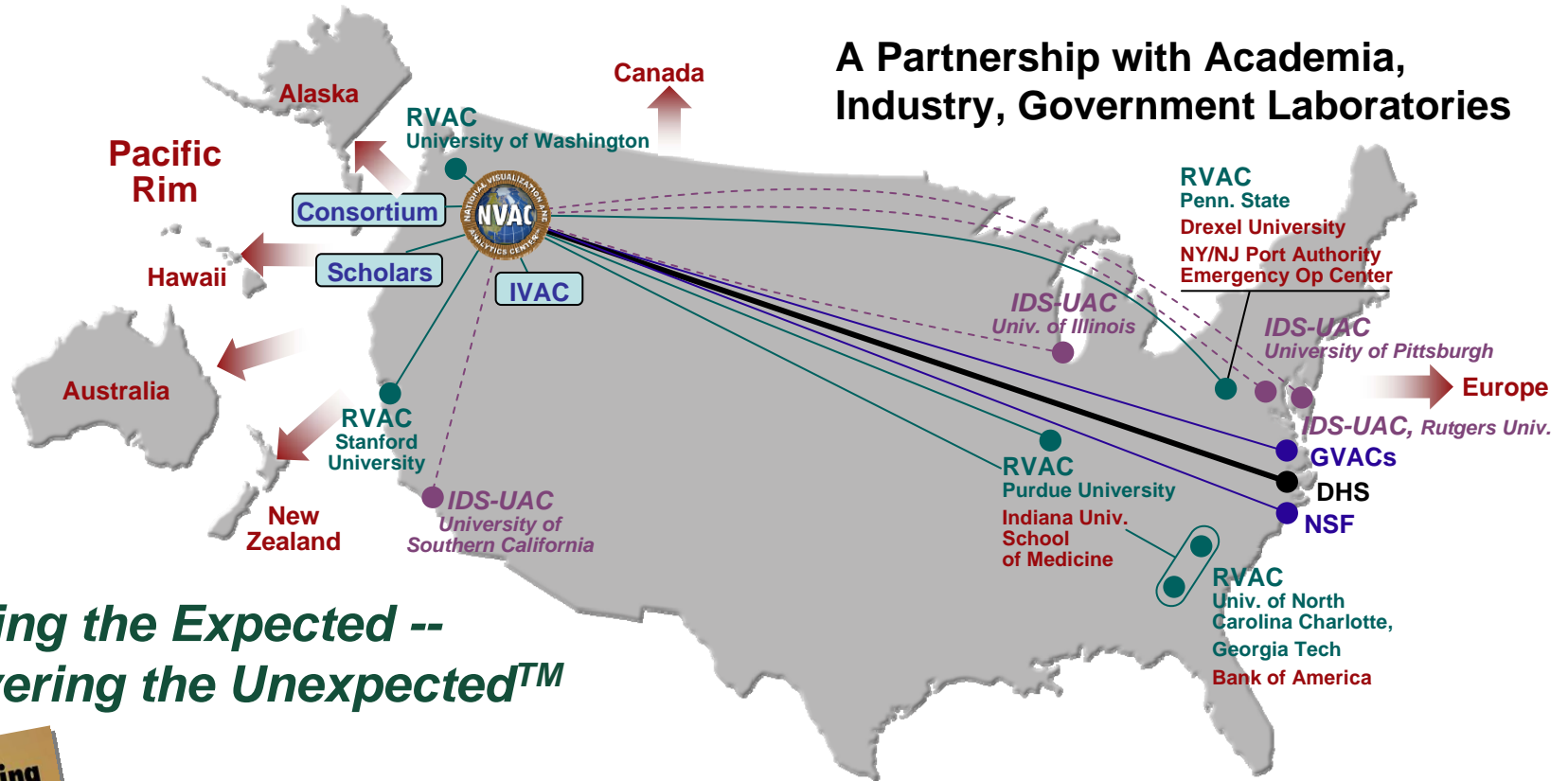
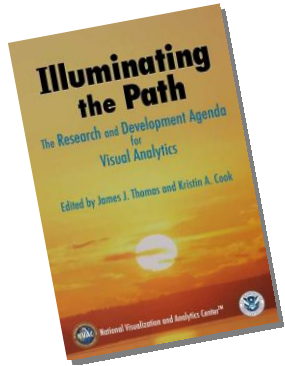




Visualization and Analytics Centers



*Detecting the Expected --
Discovering the Unexpected™*



Dr. Richard May
Deputy Director | National Visualization and Analytics Center
Pacific Northwest National Laboratory
richard.may@pnl.gov | <http://nvac.pnl.gov>

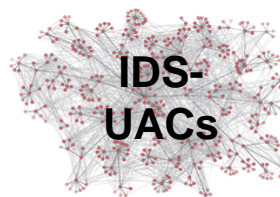


CompStat NG



(Computer Statistics, the next generation)

Deploying advanced visual and data analytics tools for crime analysis and counter-terrorism for use in force deployment.



Intuidex

- Team
- Tom Kowalczyk
 - Richard May
 - Debbie Payne
 - Bill Pike
 - William Pottenger
 - Pam Scanlon
 - Michael Tobia



Seattle Fusion Center



THE PORT AUTHORITY OF NY & NJ



CompStat NG - Background



- What is it?
 - Employs advanced visual and data analytics for crime analysis and counter-terrorism (emphasizing proactive but also supporting reactive).
 - Provides crime and counter-terrorism information in a web based system for entry and retrieval of information.
 - Enables real-time situational awareness on any networked device (Large Screen Interactions, PC, smart phone).
- What kind of change can it enable?
 - Dramatic improvements in fighting crime and counter-terrorism.
 - Better employment of forces with resulting reduction in crime.
- How does it do it?
 - Analyze data anywhere at anytime
 - Place the information in context
 - Take advantage of volumes of information



Current Activities



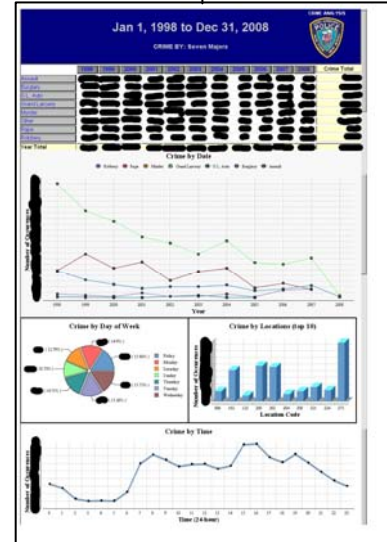
Seattle Fusion Center



11,000 portal users

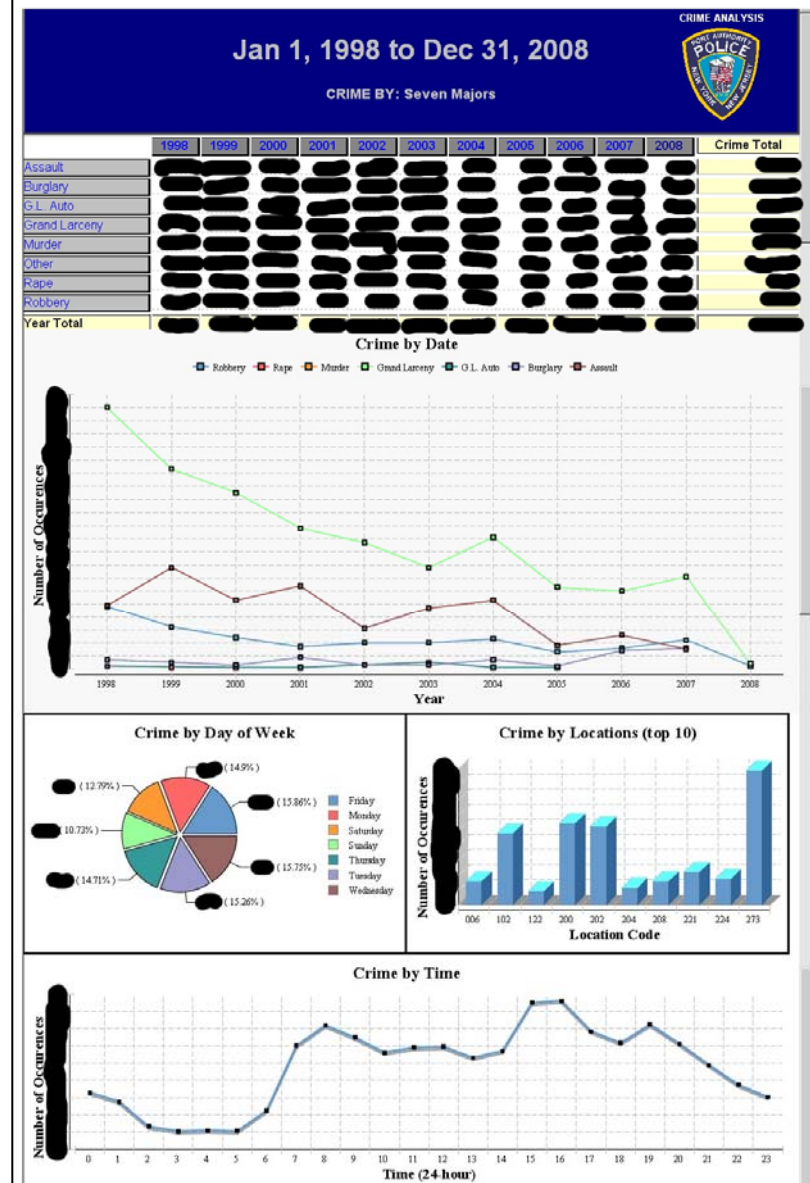
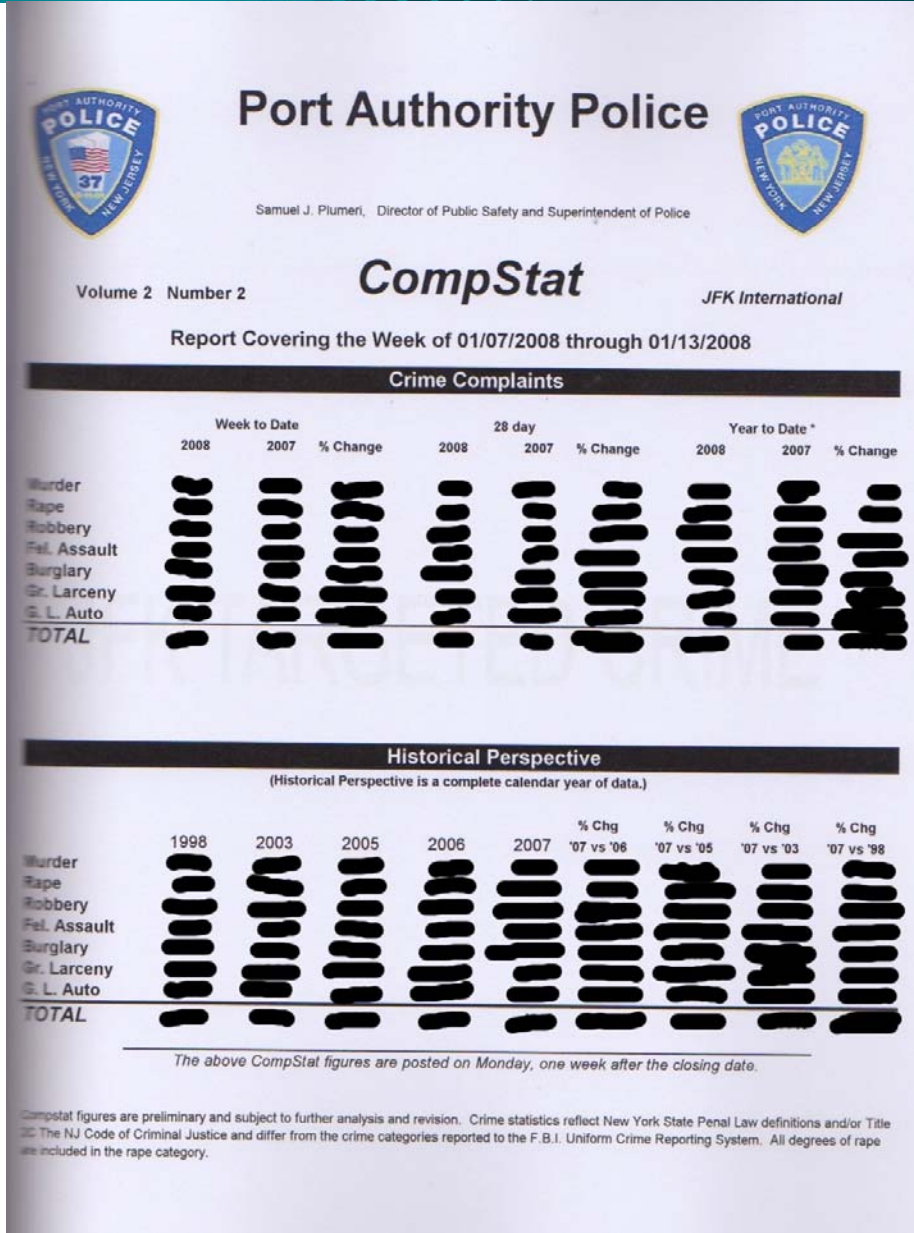


500+ PDA users





Structured Data Statistics





New Analysis Tools



http://nvacmobile.pnl.gov/srs/development/arjis/dashboard.html

preVALE

proactive/reactive visual analytics for law enforcement

Timeline Clusters Entities Spreadsheet Charts



User ID: 00001 Sign In

Query
0 selected
0 unselected

New Query

Last 4 Queries:

Saved Queries:

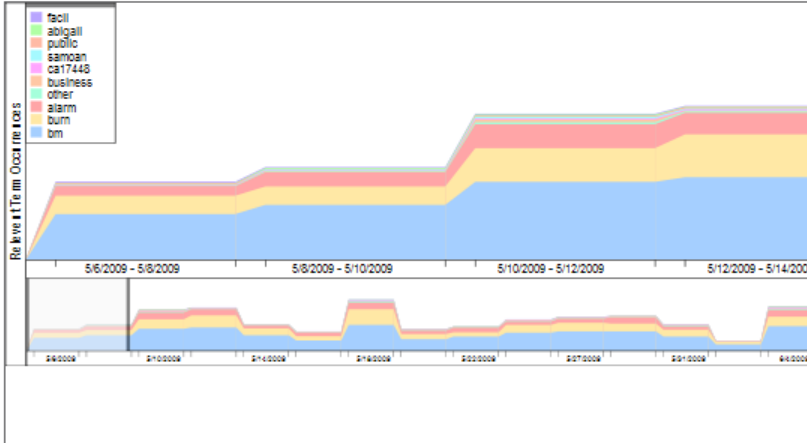
Explosives / San Diego
Last update: 6/2/2008
2:26:45 PM
51 records

San
Last update: 5/16/2008
2:09:55 PM
9027 records

Vehicle theft
Last update: 2/6/2008
6:46:04 PM
218 records

Diego
Last update: 5/27/2008
11:25:39 AM
9002 records

Topics



Facets

Initial search - 218 results

| | |
|-------------------------------------|----------------------------------|
| OrganizationName | ChargeSeverityText |
| PALOMAR COLLEGE (7) | MISDEMEANOR (60) |
| I.C.L.E.C.C. (6) | INFRACTION (57) |
| NAVAL INVEST SV (6) | FELONY (51) |
| US BORDER PATRL (6) | OTHER (49) |
| US COAST GUARD (6) | |
| CNTY MFD EXAMFR (5) | |

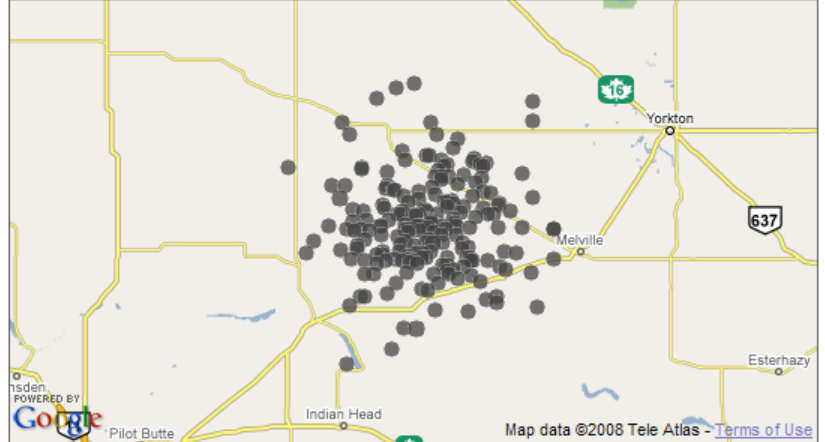
| | |
|-----------------------------|--|
| StatuteCodeID | LocationCityName_s |
| 10851 (218) | San Diego (198) |
| | 100 Palms (1) |
| | Bank Americard (1) |
| | Cal Poly Student Dorms (1) |
| | Eagle Tree (1) |
| | Fields Landing (1) |

| | |
|---------------------------|----------------------------|
| PersonEyeColorCode | PersonHairColorCode |
| BLK (71) | BLK (48) |
| BLU (64) | GRY (38) |
| BRO (49) | BLN (32) |
| YYY (8) | BRD (31) |

List

- <-> Autosort:
- 07306589 [CRIME CASE](#) [SAN DIEGO](#)
10851 [undefined](#) [TAKE VEHICLE W/O OWNER'S CONSENT/VEHICLE THEFT](#)
1000 [chesnut AVENUE](#), [SAN DIEGO](#), [CA](#)
06/24/2007 20:00:00
 - 7585457 [VETERAN AFFAIRS](#)
10851 [OTHER](#)
7889 [Mack](#) [BIKE PATH](#), [San Diego](#), [CA](#)
05/12/2009 09:36:00
 - 7585557 [CITY ATTORNEY](#)
10851 [MISDEMEANOR](#)
9244 [Kauffman MALL](#), [San Diego](#), [CA](#)
05/14/2009 00:00:00
 - 7585610 [GROSSMONT COLLG](#)

Map





Mixing and Matching



http://nvacmobile.pnl.gov/srs/development/arjis/dashboard.html

preVALE

proactive/reactive visual analytics for law enforcement

List Topics Timeline Clusters Entities



User ID: 00001 Sign In

Query
0 selected
0 unselected

New Query

Last 4 Queries:

Saved Queries:

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2:09:55 PM
9027 records

Vehicle theft
Last update: 2/6/2008
6:46:04 PM
218 records

Diego
Last update: 5/27/2008
11:25:39 AM
9002 records

Spreadsheet

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Total |
|----------------|------|------|------|------|------|------|------|------|------|------|------|-------|
| MARINA/WATER | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| SCHOOL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 24 |
| RESIDENTIAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 |
| INDUSTRIAL/MFG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 |
| BUSINESS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| OPEN SPACE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 |
| RECREATIONAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| INSTITUTIONAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| OTHER | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| Year Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 199 | 199 |

Facets

Initial search - 218 results

OrganizationName
[PALOMAR COLLEGE](#) (7)
[I.C.L.E.C.C.](#) (6)
[NAVAL INVEST SV](#) (6)
[US BORDER PATRL](#) (6)
[US COAST GUARD](#) (6)
[CNTY MFD EXAMFR](#) (5)

ChargeSeverityText
[MISDEMEANOR](#) (60)
[INFRACTION](#) (57)
[FELONY](#) (51)
[OTHER](#) (49)

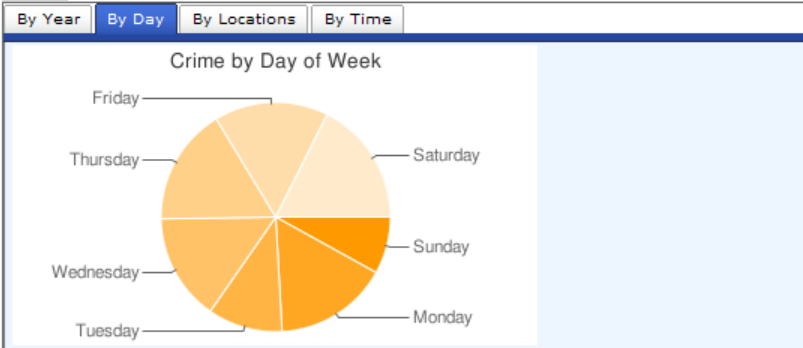
StatuteCodeID
[10851](#) (218)

LocationCityName_s
[San Diego](#) (198)
[100 Palms](#) (1)
[Bank Americard](#) (1)
[Cal Poly Student Dorms](#) (1)
[Eagle Tree](#) (1)
[Fields Landing](#) (1)

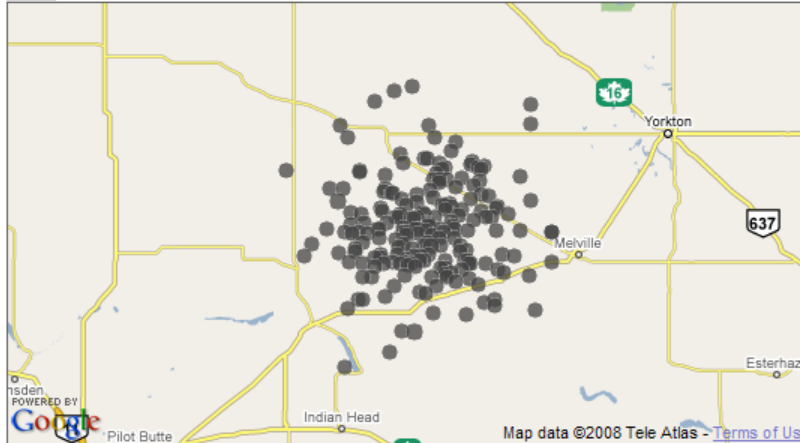
PersonEyeColorCode
[BLK](#) (71)
[BLU](#) (64)
[BRO](#) (49)
[YYY](#) (8)

PersonHairColorCode
[BLK](#) (48)
[GRY](#) (38)
[BLN](#) (32)
[BRD](#) (31)

Charts



Map





Analytical Interfaces



SRS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://nvacmobile.pnl.gov/srs/billDev/SRS/home.xhtml

Richland, Washington ... Google SRS SRS billDev SRS dev SRS Dashboard

URIQA: The Nokia URI Query Agent M... SRS PNNL: Data-Intensive Computing Initia... Google Mail - AAG Extends Deadline fo...

Workspace

Save

Workspaces:

3 4 Pandemic Flu Open

Reasoning artifacts

Search

Search

Case: Pandemic Flu

Message2Mobile

Destination: Demo Treo Priority: 1 Send

Products

Import

URL: http:// View

Watch lists

New workspace

Watch Lists

Treo PT17203 collapse

- Photo (image) Tue, 30/Oct/2007 6:09
- Sketch (image) Mon, 29/Oct/2007 20:43
- Note (text) Thu, 23/Aug/2007 13:26
- Human cases rising (image) Thu, 23/Aug/2007 13:25
- Note (text) Thu, 23/Aug/2007 11:52
- Photo - H5N1 detection chip (image)

Human cases rising

Add note...

Emerging market impact

Reduction of net capital flow

Retreat of capital

Add note...

Economic depression

Add note...

Social disruption

Add note...

Waterfowl in Germany

Appear to be acting as disease vectors without showing symptoms

QUERY: europe

contents visualization reasoning search

186 items. Harvesting...

Edit Terms

influenza countries disease spread human

Oct-2006 Jan-2007 Apr-2007 Jul-2007 Oct-2007

0 33 0 0 28 53 34 38

Docs

Vaccine effectiveness

Sinovac regimen triggers immune response in 80% of

Vaccine availability

National vaccine stockpiles suffer 80% of infections

QUERY: outbreak

contents visualization reasoning search

33 items. Harvest complete.

Map Satellite Hybrid

North America Europe Asia South America Africa India Australia

Pacific Ocean Atlantic Ocean Indian Ocean

POWERED BY Google

Terms of Use

Done

1 Error



Mobile Tools

Data collection and Communications

The screenshot shows a mobile application interface for data collection and document viewing. On the left, a 'Form' window contains fields for 'Officer' (Joe Swanson), 'Officer ID' (4547894), 'Beat', 'Crime Potential' (Loitering), and 'Remarks (reason for stop)' (Suspect reported loitering). Below these are fields for 'Vehicle' (Year, Make, Model, Color Ext, Color Int) and 'Interviewee' (Type: Vehicle, Property). A 'Submit' button is visible. An arrow points from the 'Remarks' field to a 'View Document' window showing a photo of a building. To the right, a 'Documents in Tree_Marked' table lists various documents with columns for ID, Name, Date, and Title. A 'Document details' window for 'Photo - Traffic stop' (#29167) shows a photo of a person in a uniform, a link to the photo, and a map of the location.

| ID | Name | ID | Date | Title |
|----|-------------------------|-------|-------------------------|---------------------------|
| 1 | Tree_Marked | 13145 | 2006-10-04T14:54:02.793 | Bubble Viz |
| 7 | 8525_Marked | 13148 | 2006-10-04T15:03:13.14 | Cluster viz |
| 8 | Shared_Notes | 13410 | 2006-10-20T14:25:21.06 | Person of interest |
| 10 | Device_33_Marked | 13422 | 2006-10-20T14:26:54.467 | Text - Stupid random text |
| 11 | Device_34_Marked | 13428 | 2006-10-22T13:01:50.31 | Text |
| 14 | Notes for AR1211 | 13429 | 2006-10-22T16:05:22.5 | Video: Office feed |
| 15 | Notes for AR1AS PT17132 | 13458 | 2006-10-22T17:23:27.09 | Sketch: Floorplan |
| 60 | My Notes | 14789 | 2004-11-19T00:00.00 | atlantictorm/NSA 19 bit |
| | | 15101 | 2006-11-22T12:29:37.123 | Text |
| | | 15114 | 2006-11-23T10:03:45.327 | Photo |
| | | 15116 | 2006-11-23T10:09:52 | GPS |
| | | 15117 | 2006-11-23T10:13:40.75 | Photo |
| | | 15119 | 2006-11-23T10:23:36.903 | GPS |
| | | 15120 | 2006-11-23T10:28:55.06 | Photo |
| | | 15122 | 2006-11-23T10:30:25.903 | GPS |
| | | 15123 | 2006-11-23T10:35:45.873 | GPS |
| | | 15124 | 2006-11-23T10:40:32.06 | GPS |
| | | 15125 | 2006-11-23T10:42:58.217 | Photo |
| | | 15127 | 2006-11-23T10:43:26.217 | GPS |
| | | 15128 | 2006-11-23T10:45:44.967 | Photo |
| | | 15130 | 2006-11-23T10:46:17.14 | GPS |
| | | 15131 | 2006-11-23T10:48:12.53 | GPS |
| | | 15133 | 2006-11-23T10:50:40.5 | GPS |
| | | 15134 | 2006-11-23T10:54:04.45 | Photo |
| | | 15136 | 2006-11-23T10:54:28.107 | GPS |
| | | 15137 | 2006-11-23T10:58:03.903 | Photo |
| | | 15139 | 2006-11-23T10:59:51.077 | GPS |
| | | 15140 | 2006-11-23T11:01:56.183 | GPS |
| | | 15141 | 2006-11-23T11:03:29.183 | GPS |
| | | 15142 | 2006-11-23T11:05:01.467 | Text |
| | | 15146 | 2006-11-23T11:07:16.17 | GPS |

Querying and Analytics

The screenshot shows a mobile application interface for querying and analytics. At the top, a 'Complex Search' window displays a network graph with nodes and arrows. Below it, a 'Time Filter Parameters' window shows time selection options: 'Time: 5/11/07 1:57:56', 'Range(+/-):', 'Start: 5/11/07 1:57:56', 'Stop: 5/11/07 1:57:56', and 'Bins:'. At the bottom, a 'SRS - VAST2006' window displays a bubble chart with nodes labeled 'fbi, al, october 42', 'al, source, october 37', '17', and '5'. A '107' value is also visible.

Situational Awareness

The screenshot shows a mobile application interface for situational awareness. It features a 'Search' window with text: 'U.S. at visual analytics Summer camp July 14-25, 2008', 'Part: the Research and Development Agenda for Visual Analytics', and 'Illuminating the Path'. Below the search results is a 'Maps' window showing a map of San Diego with a red line indicating a route. The map includes labels for 'San Diego', '163', 'Balboa Park', and '500 ft'.

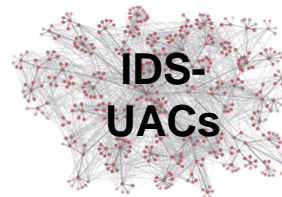


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THE PORT AUTHORITY OF NY & NJ



Homeland Security