

Digital Evidence: Where is it? What is it?

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Foundations of Digital Evidence

Computer Forensics



Allocated vs. Unallocated Space



ACTIVE DATA IS STORED IN
ALLOCATED SPACE



UNALLOCATED SPACE, AKA
“FREE SPACE,” IS THE AREA
WHERE NEW FILES CAN BE
STORED.

Cookies and deleted files



What is Metadata?

- “Data about data” – background information about a file
- A digital footprint that tells the story behind the content
- Invisible to the eye, but critical in investigations

Types of Metadata



System Metadata

File size, type, creation/modification dates, user info



Application Metadata

Created by the software (e.g., Word author field, PDF edit history)



Embedded Metadata

Stored inside the file (e.g., GPS in photos, email header info)

Why Metadata Matters

Authenticity → Detects tampering or alteration

Timeline → Establishes when events occurred

Attribution → Connects files to users, devices, or locations

Context → Adds evidence beyond visible content

Online History

The screenshot shows a web browser window with the address bar displaying `ny/watch?v=dOwu45MbVt4`. The browser's address bar contains the text "nypd domain awareness system". The main content area displays a video titled "How real-time 911 analytics works" with a diagram illustrating the process: "Location of 911 call" leads to "ADDRESS MATCHING", which leads to "GEOCODED RADIUS SEARCH", which leads to "2.2 billion DAS records". This process then leads to "RECORD PRIORITIZATION", which leads to an "Interactive Report" showing a list of items: 1. ACTIVE WARRANTS, 2. 911 EDINGIDE, 3. DOMESTIC INCIDENTS, 4. ARRESTS, 5. COMPLAINTS (PERPETRATORS), and 6. ACTIVE ICARDS. The video player includes a progress bar and a "NYPD" logo.

A sidebar on the right shows the browser's history, listing recent visits such as "2016 Edelman Finalist NYPD - YouTube", "nypd domain awareness system - YouTube", and "Inbox (1) - alicefontier@gmail.com - Gmail".

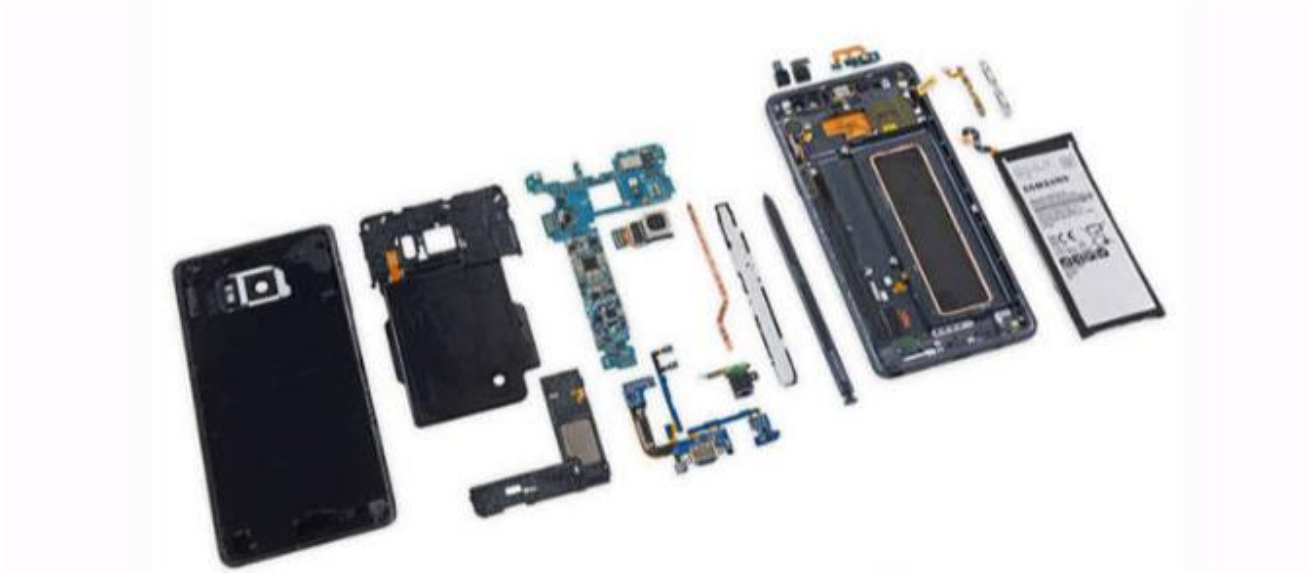
In the top right corner, a notification bell icon is highlighted with a red circle and a red arrow pointing to it. The notification bell icon is labeled "Not syncing".

Mobile & Cloud Data





Cell Phones



Texts/Emails/Messages
Photos and Videos

Data from apps
Stored data

Your life:
In Searchable Format

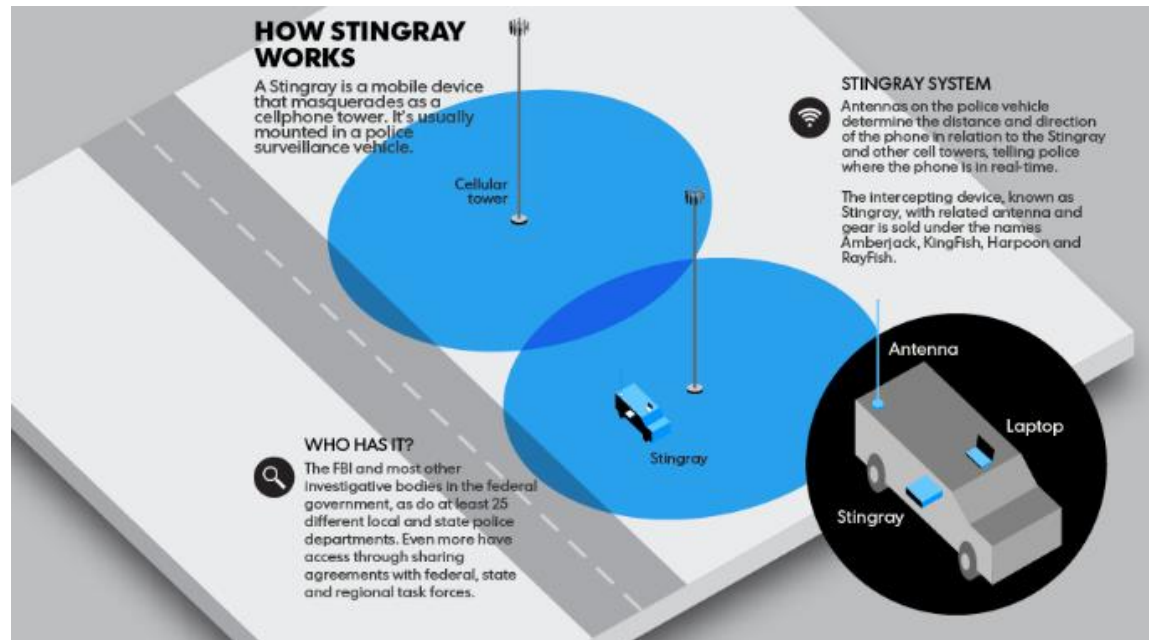


Accessing Cell Phone Data

Cell Phone Location Tracking



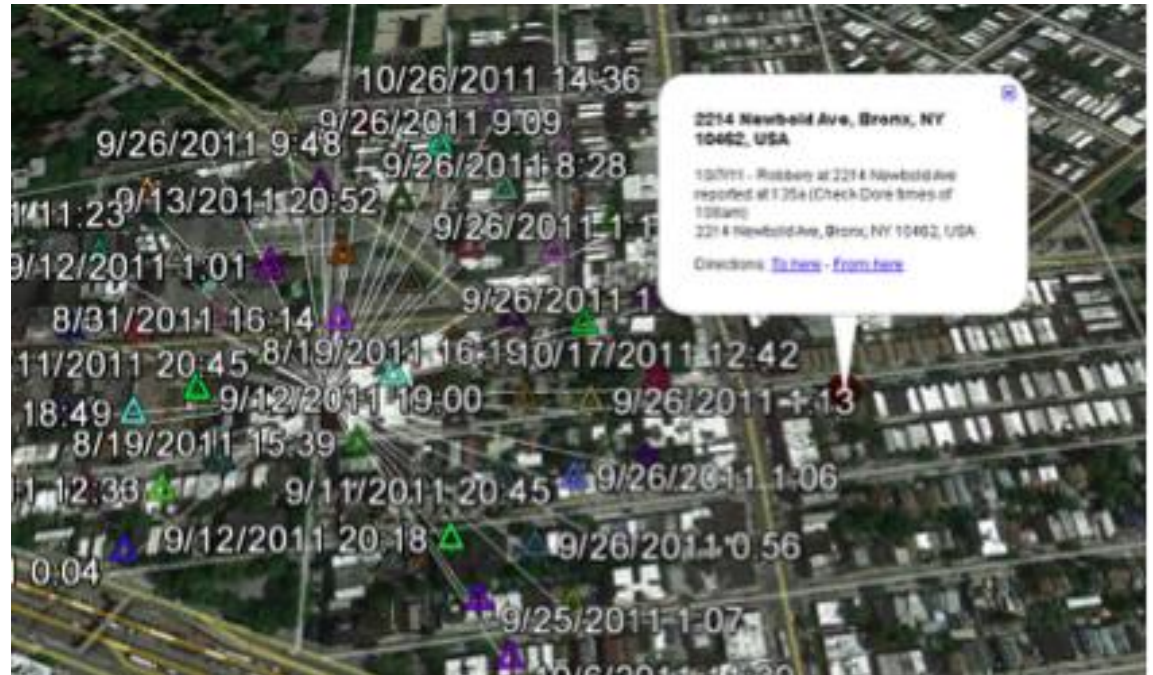
Location: Stingray Tracking



Cell Site Location Data: Prosecution



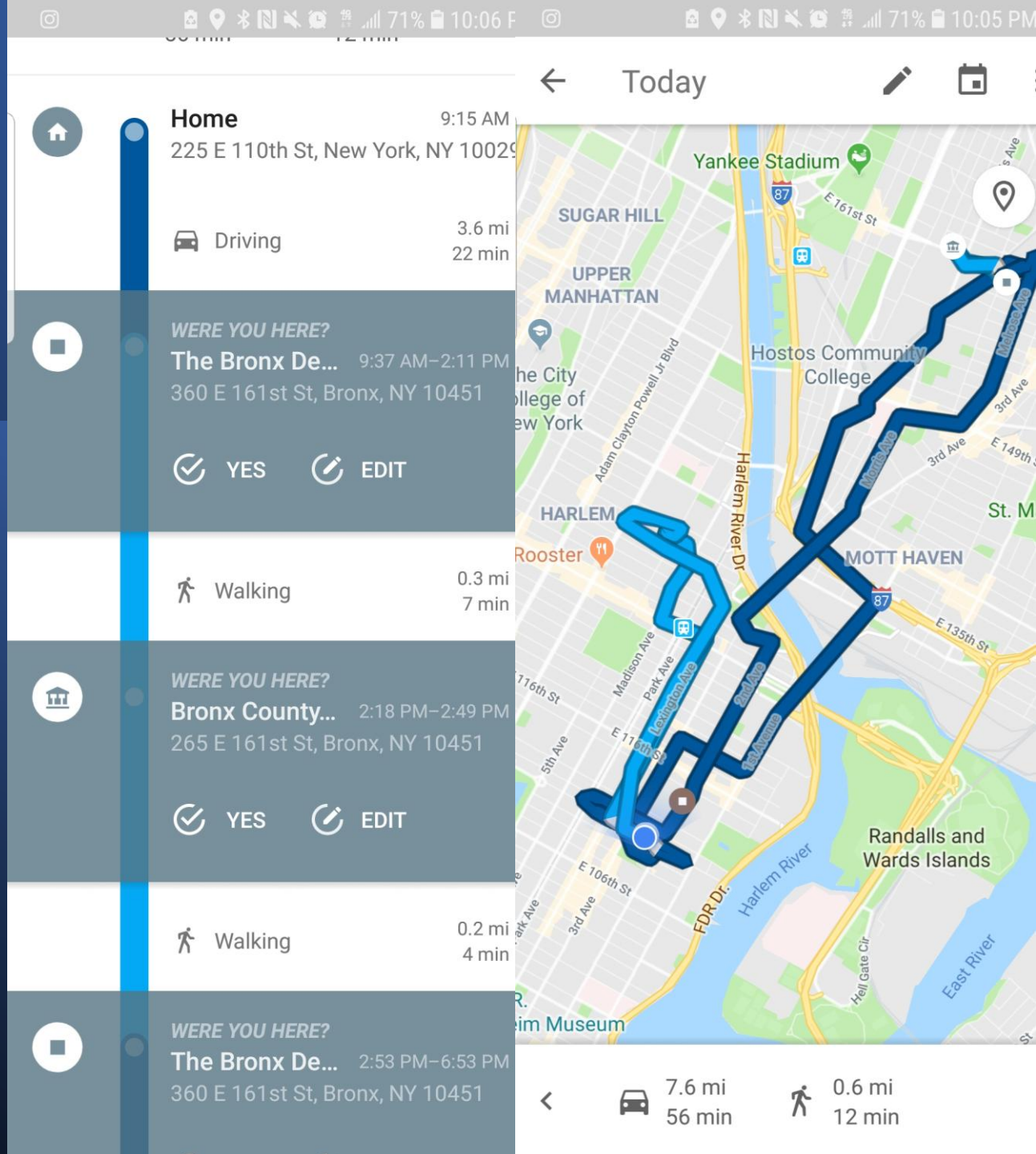
Cell Site Location Data: Defense



Cell Site Location Data: Defense



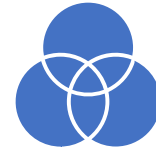
Google Maps Location



Cloud-Based Evidence



Evidence stored in Google Drive, iCloud, Dropbox, OneDrive



Data spans multiple jurisdictions; cross-border privacy conflicts



Providers require formal legal process (warrants and/or subpoenas)



Risks: broad data sweeps, over-collection, and incomplete returns



In widespread use for advertising purposes

Accessible to law enforcement

Google was receiving more than 200 per week until they stopped responding in 2024

Geofence Tracking



Social Media



Signal

Encrypted Messaging Apps

Cameras and Video



Smart Home Devices

Smart home devices (Alexa, Ring, Nest, Fitbit, smart TVs) log user behavior

Evidence: location, activity levels, home entry/exit, voice commands

Device ecosystems often sync with cloud storage

Challenges: data sprawl, privacy concerns, proprietary formats

Body Worn Cameras



Body Worn Cameras

BODY-WORN CAMERA POLICIES SHOULD STRIKE THE RIGHT BALANCE OF

- ✘ **PRIVACY,**
- ✘ **PUBLIC ACCESS &**
- ✘ **ACCOUNTABILITY.**

IN MISSISSIPPI, POLICIES LARGELY FAIL TO COMPLY WITH THESE PRINCIPLES.

#BODYCAMSPOLICY



FAIL

Axon Body 4: Not just a camera

Watch Me

Bi-Directional
Communications

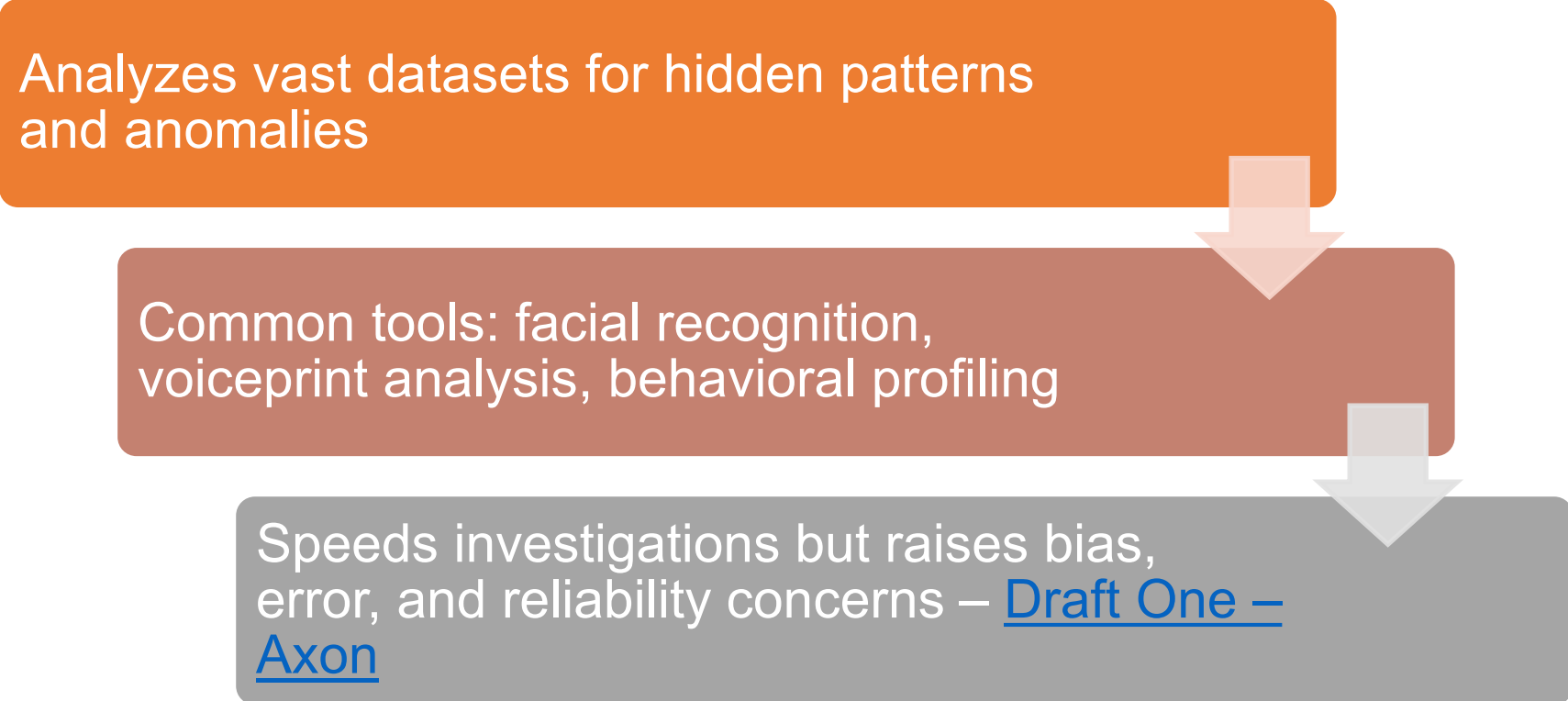
Body 4 Camera User Guide



Models: AX1037, AX1038

AI in Digital Forensics

Analyzes vast datasets for hidden patterns and anomalies



```
graph TD; A[Analyzes vast datasets for hidden patterns and anomalies] --> B[Common tools: facial recognition, voiceprint analysis, behavioral profiling]; B --> C[Speeds investigations but raises bias, error, and reliability concerns – Draft One – Axon];
```

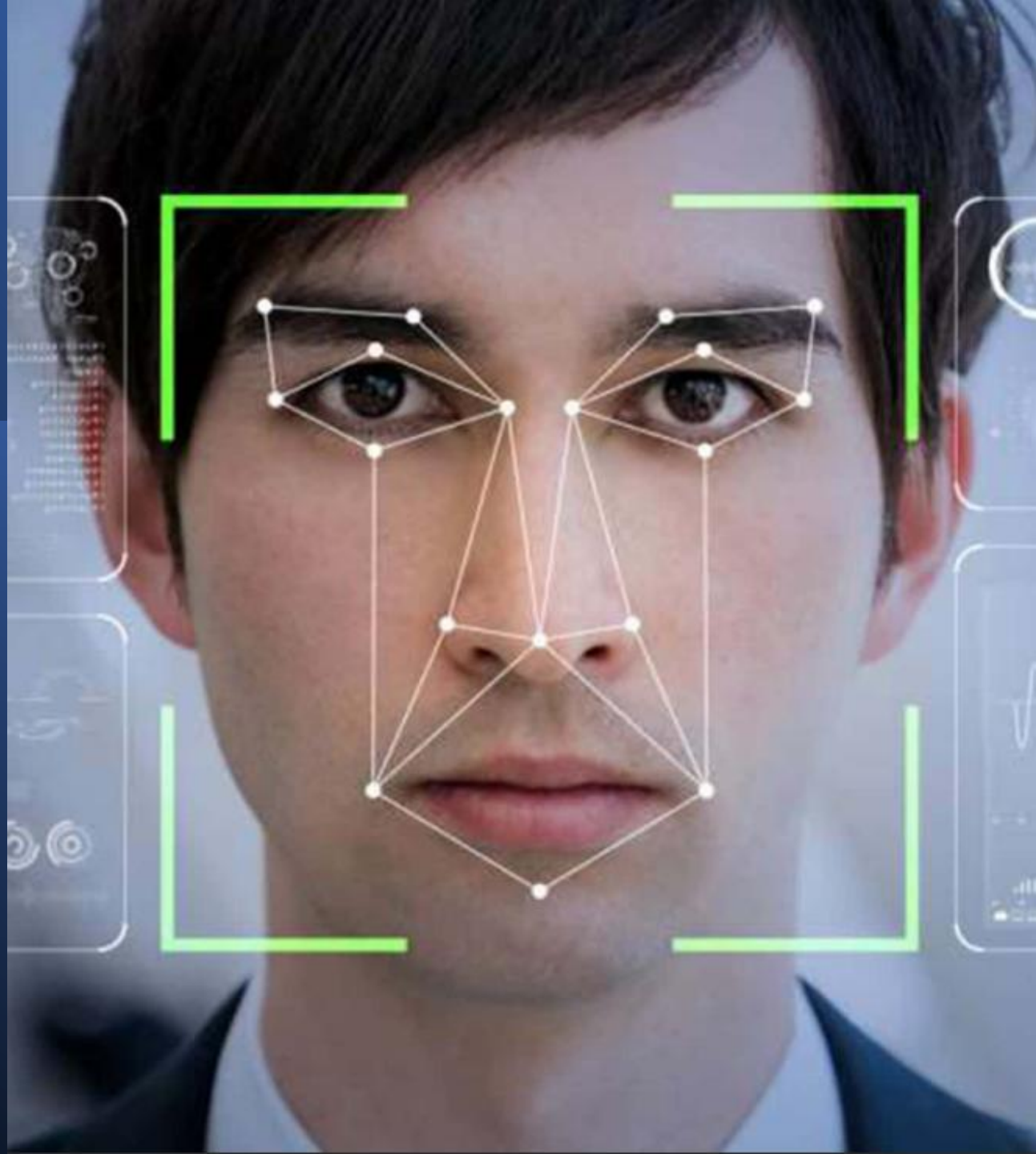
Common tools: facial recognition, voiceprint analysis, behavioral profiling

Speeds investigations but raises bias, error, and reliability concerns – [Draft One – Axon](#)

License Plate Readers



Facial Recognition Technology





Prevalence of U.S. law enforcement face recognition

www.banfacialrecognition.org



**The Mississippi
Department of
Public Safety
(MDPS) uses FACES**

Facial Recognition Technology

Identifier: 1400 Add Probe Search Refresh Session Show Last Removed

Description: Add Data File Search All Show Session Show All Removed Print

Save Description Sessions New Session Delete Session Close

Combined Results: ☐ Add Minimum Threshold Side By Side Comparison



Score	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review
927.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review
941.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review
915.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review
758.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review
706.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review

1 of 5

Searches: ☐ Display Probe Beside Each Row Search Type:

Probe(s)



NEC

Score	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
927.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
941.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
915.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
758.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
706.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
641.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
618.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove
580.000	Compare	Chart Compare	Data and Images	Linked Images	Mark for Review	Remove

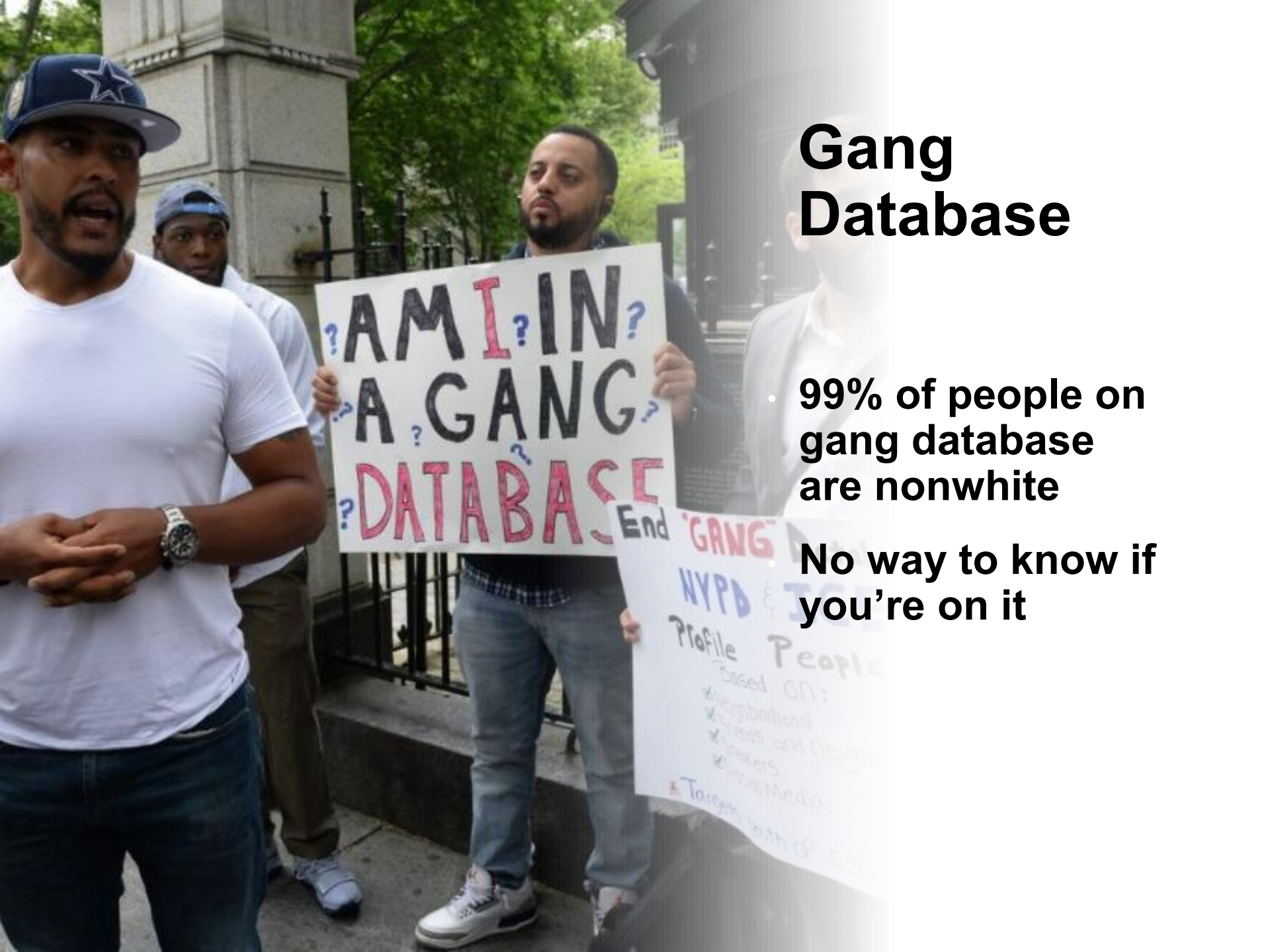
1 of 243

Side By Side Comparison

Edit and Add Probe Edit and Replace Probe Delete Probe Select Probe Add Link Comment

**Predictive policing
and digital
surveillance**





Gang Database

- 99% of people on gang database are nonwhite

No way to know if you're on it

Criteria

maintain the integrity of the Gang Division's Membership data base, the following is the criteria which will be adhered to for an individual to be qualified for entry into the D.S. data base as an identified gang member:

- ☐ An individual will be entered if he/she admits to membership during a debriefing
- Or**
- ☐ Through the course of an investigation an individual is reasonably believed to belong to a gang and is identified as such by two independent sources. (Ex. Pct. Personnel, Intell, School Safety, Dept. of Correction, Outside Agency) Sources: _____
- Or**
- ☐ Meets any **Two** below mentioned Criteria:

IDS

☐ N

☐ P

☐ **Known Gang Location**

☐ **Scars/Tattoos Associated W/Gangs**

☐ **Gang Related Documents**

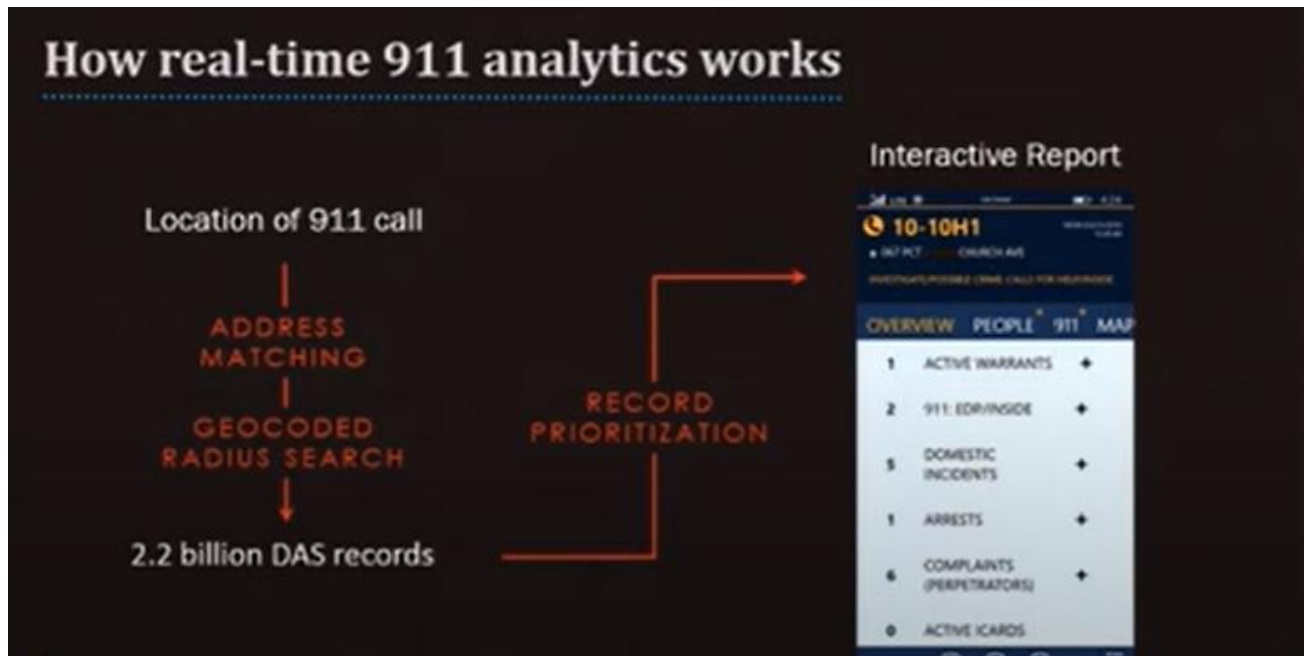
☐ **Colors Associated W/Gangs**

☐ **Association W/ Known Gang members**

☐ **Hand Signs Associated W/Gangs**

Gang Database

Over inclusive and
vague criteria



Address; Caller name and phone number;

Linked to full database

Screen shots from NYPD video at: [\(98\) 2016 Edelman Finalist NYPD - YouTube](#)

911 Analytics

All 911 calls routed
to all officer's
phones

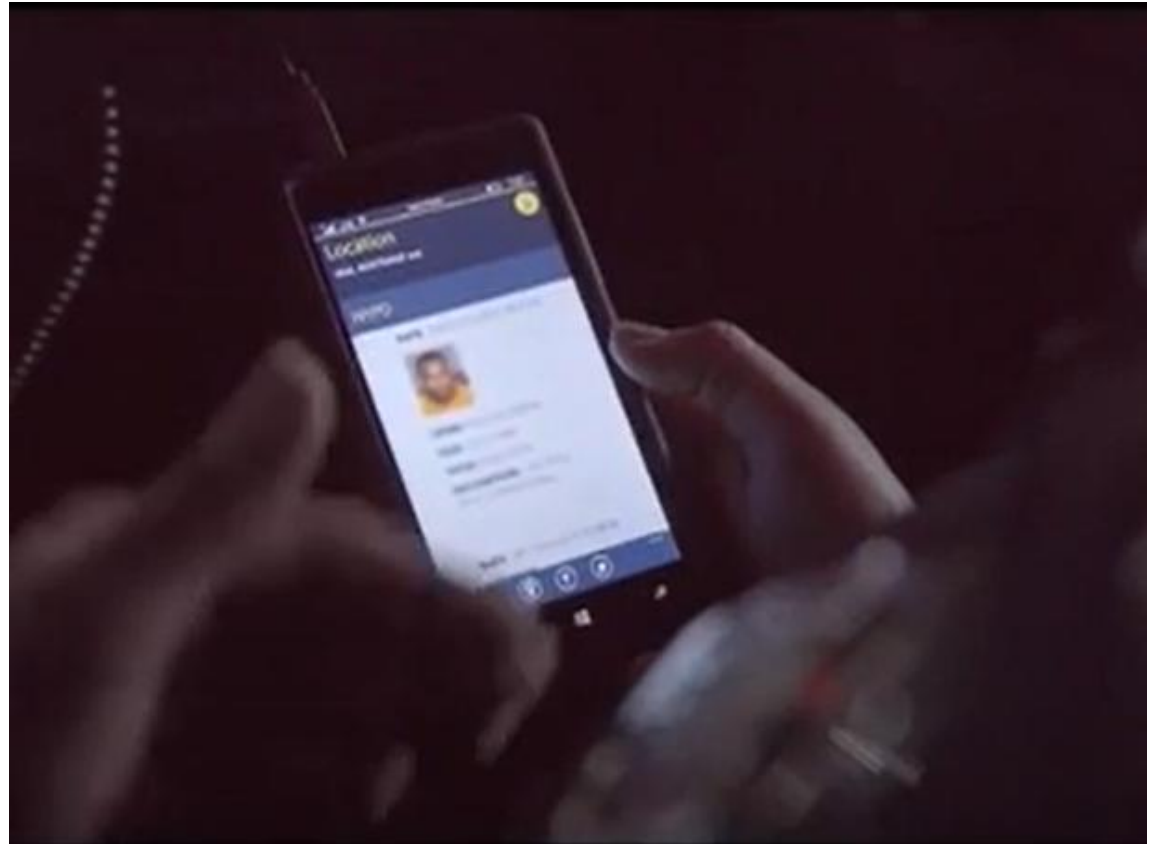
911 Analytics



911 Analytics



911 Analytics



PATTERNIZR

Algorithmically finds “patterns” linking complaints

Initially just burglary, robbery, and grand larceny

Built in-house by the NYPD

NYPD boasts it's no more discriminatory than random pair of NYPD arrests

AI Report
Writing

REWRITE REPORT WRITING

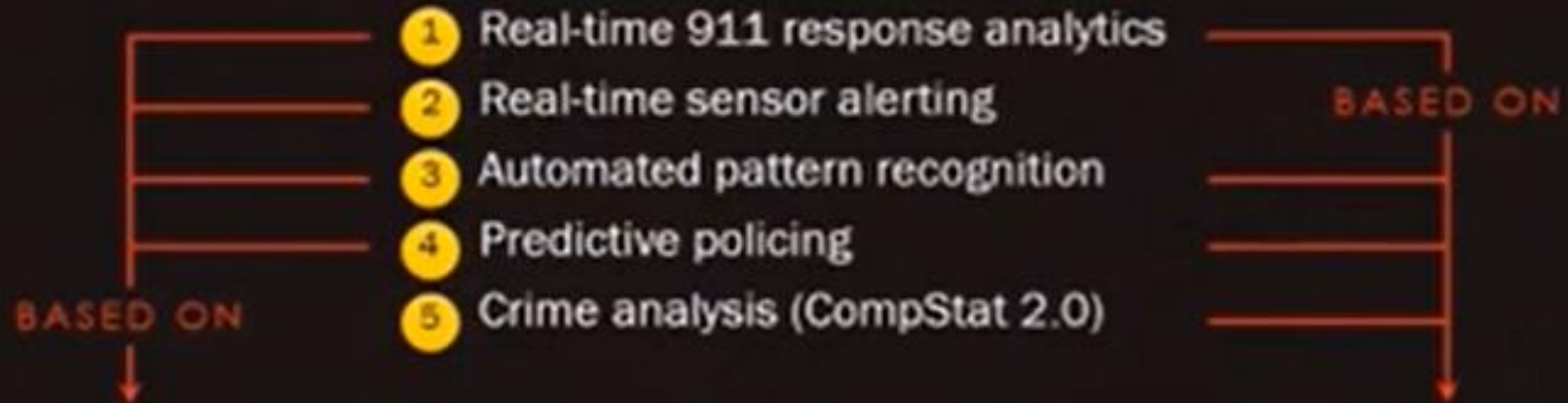


WATCH THE VIDEO

**BIG DATA:
DOMAIN
AWARENESS
SYSTEM
(DAS)**



Analytic Techniques Delivered Through DAS



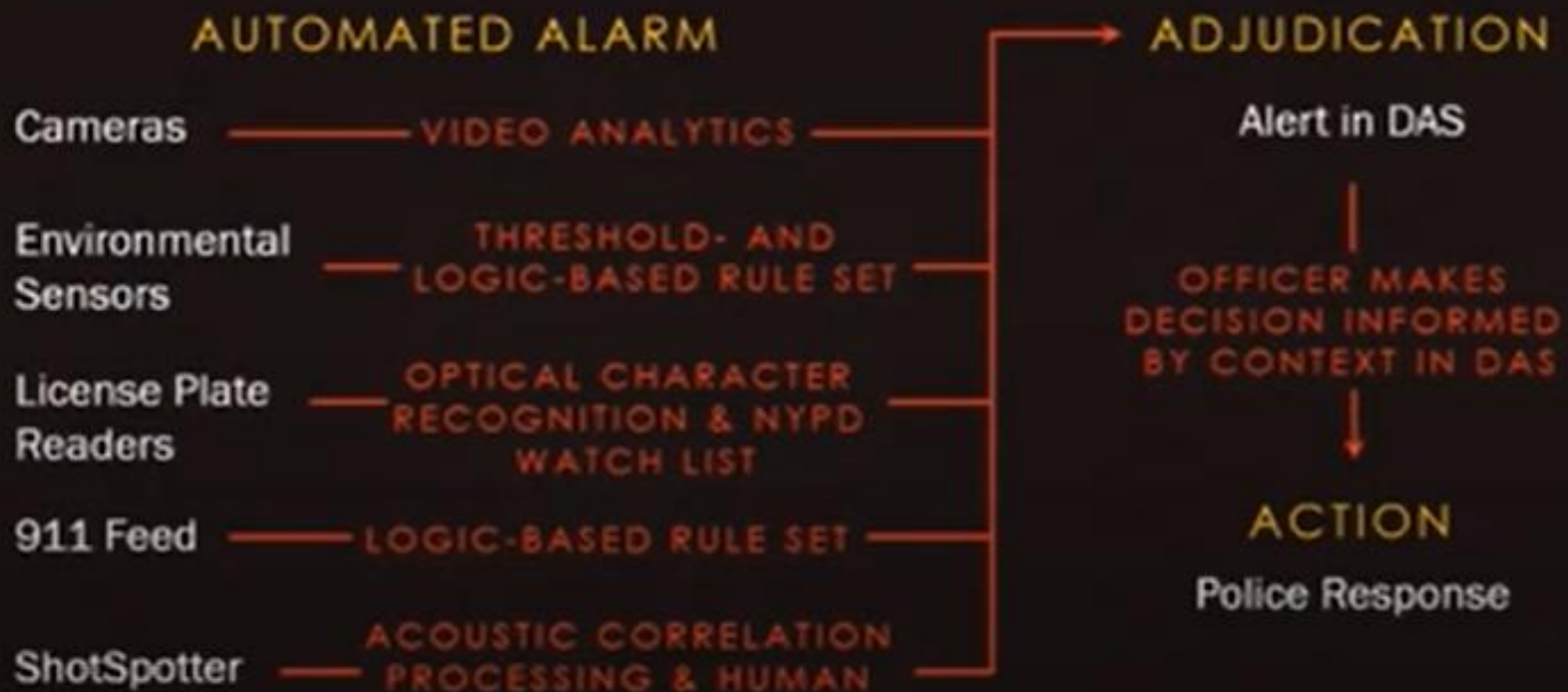
Real-time Sensor Data

Closed-circuit television cameras
License plate readers
Radiation and chemical sensors
Audio gunshot detectors
911 calls

Geo-coded Records Data

Arrests
Warrants
Complaints
Domestic incident reports
Etc...

Real-time sensor alerting is a three-step process





Domain Awareness System = NYPD/Microsoft joint initiative

Licensed out to other cities with 30% cut to New York

NYPD's Big Data is for sale

2025 Fall OSPD & MPDA Public Defender Conference

Session Eight:
Digital Forensic Evidence: An Overview of
the Available Technologies and How They
Appear in Cases

Thursday, October 23, 2025
2:05- 3:35 p.m.
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