

Big Data: New challenges for law and ethics,

Ljubljana, 22-23 May 2017

Algorithmic prediction in crime control

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Content

1. Big data semantics
1. Automated automated governance
1. Towards automated justice
1. Big data and its discontents



Content

1. Big data semantics

1. Towards automated governance
1. Towards automated justice
1. Big data and its discontents



1 “Big data” semantics

- “meaning extraction”
- “sentiment analysis”
- “opinion mining”
- “computational treatment of subjectivity in text”
- »actionizing« data (real-time & near real-time
intervent.)
- “monetizing” data (“doing more with less”)



1 “Big data” semantics

- “person of interest”
- “escalating behavior”
- “sleeping terrorist”
- “signature strike”



1 “Big data” semantics

- Knowledge production
 - “the end of theory”
 - insight “born from the data”
 - “the data speak for themselves”



1 “Big data” semantics

Consequences:

- Crime-relevant knowledge = database
- Proper reasoning = algorithms
- How to tackle crime = predictive policing
- How to prosecute cases = automated justice



1 “Big data” semantics

Consequences:

- “suspect”, “reasonable doubt”, “the presumption of innocence”,... confine agencies and prevent abuses of power
- “automatic justice minimise[s] human agency and undercuts the due process safeguards built into the traditional criminal justice model.” (Marks et

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2 Automated governance

- From narrative to database (Franko)
- From database to automated decision-making



2 Automated governance

- Implications for Democracy
 - Cambridge Analytica (USA)
 - Total information awareness system (Singapore)



2 Automated governance

- Implications for Democracy
 - Cambridge Analytica (USA)
 - Total information awareness system (Singapore)
- “Robotopticon” (Pasquale)



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1. Towards automated
justice?

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3 Towards automated justice?

Big data in the crime control domain:

- 1) intelligence agencies
- 2) law enforcement agencies
- 3) criminal courts through remand and parole procedures
- 4) probation commissions
- 4) offices of legal counsellors



3 Towards automated justice?

- To predict the outcomes of legal problems (Ashley and Brüninghaus, 2006)
- To decide on co-financing litigations (e.g. Legalist.us),
- To help human lawyers conduct research more quickly (e.g. rossintelligence.com)
- To predict the judicial decisions



To predict the judicial decisions of the Supreme Court of the U S A

ars TECHNICA



BIZ & IT

TECH

SCIENCE

POLICY

CARS

GAMING & CULTURE

FORUMS

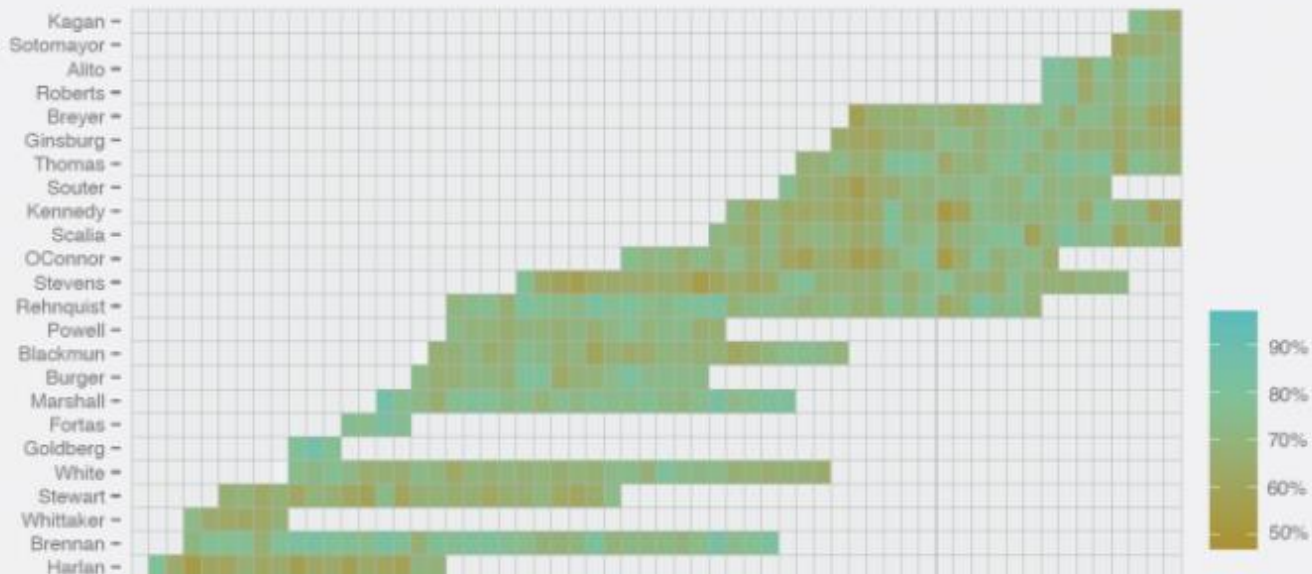


SCIENTIFIC METHOD —

Algorithm predicts US Supreme Court decisions 70% of time

Supreme Court fantasy league to compete against computer model in upcoming term.

DAVID KRAVETS - 7/30/2014, 6:41 PM



Predicting judicial decisions of the European Court of Human Rights: a Natural Language Processing perspective

Artificial Intelligence

Computational Linguistics

Data Mining and Machine Learning

Data Science

Natural Language and Speech

Nikolaos Aletras[✉]1,2, Dimitrios Tsarapatsanis³, Daniel Preoțiu-Pietro^{4,5}, Vasileios Lamos²

October 24, 2016

> Author and article information

✓ Abstract

“Our models can predict the court’s decisions with a strong accuracy (79% on average).”

3 Automated policing

- Preventive screening of Muslims in Germany
- Police Twitter analysis in Slovenia
- Card payment fraud prevention (e.g. skimming cases)
- Identification of members of violent criminal groups (UK)
- Etc.
- Crime predictive software (e.g. *BlueCrush*, *TrapWire*)



3 Automated policing

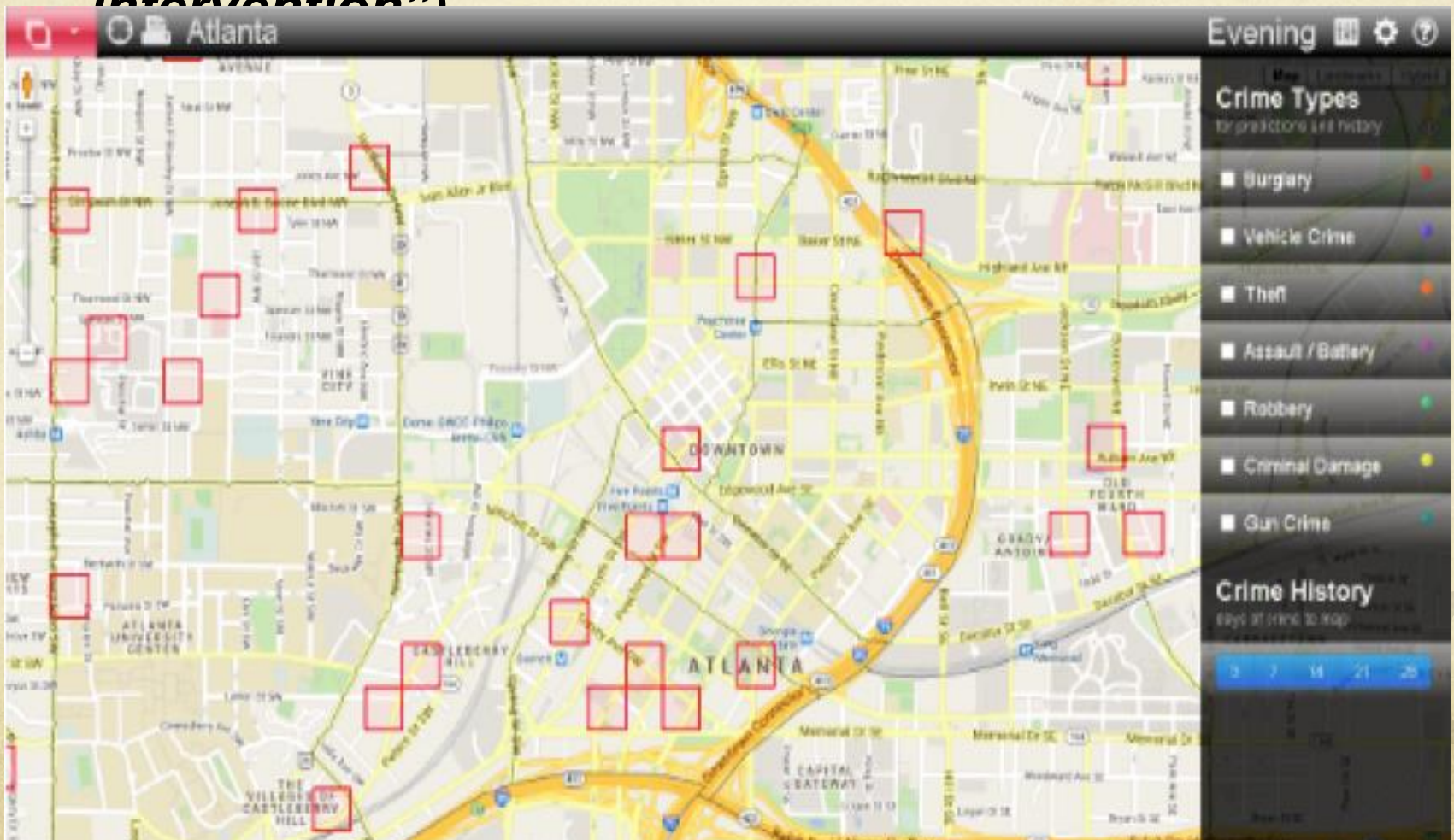
Crime predictive software **Blue Crush**
(**Criminal Reduction Utilizing Statistical History**):

- incorporates fresh crime data from sources that range from the MPD's records management system to video cameras monitoring events on the street
- multilayer maps with crime hot spots: "current activity levels, and also any shifts in such activities"
- granularity: "Granular tracking crime of crime patterns enables MPD *to predict future crime hot spots* and direct police resources there proactively."



3 Automated policing

Crime predictive software **PredPol** (“*evidence-based intervention*”)





IN YOUR CORNER

PREDICTIVE POLICING
STOPPING CRIMES BEFORE THEY HAPPEN



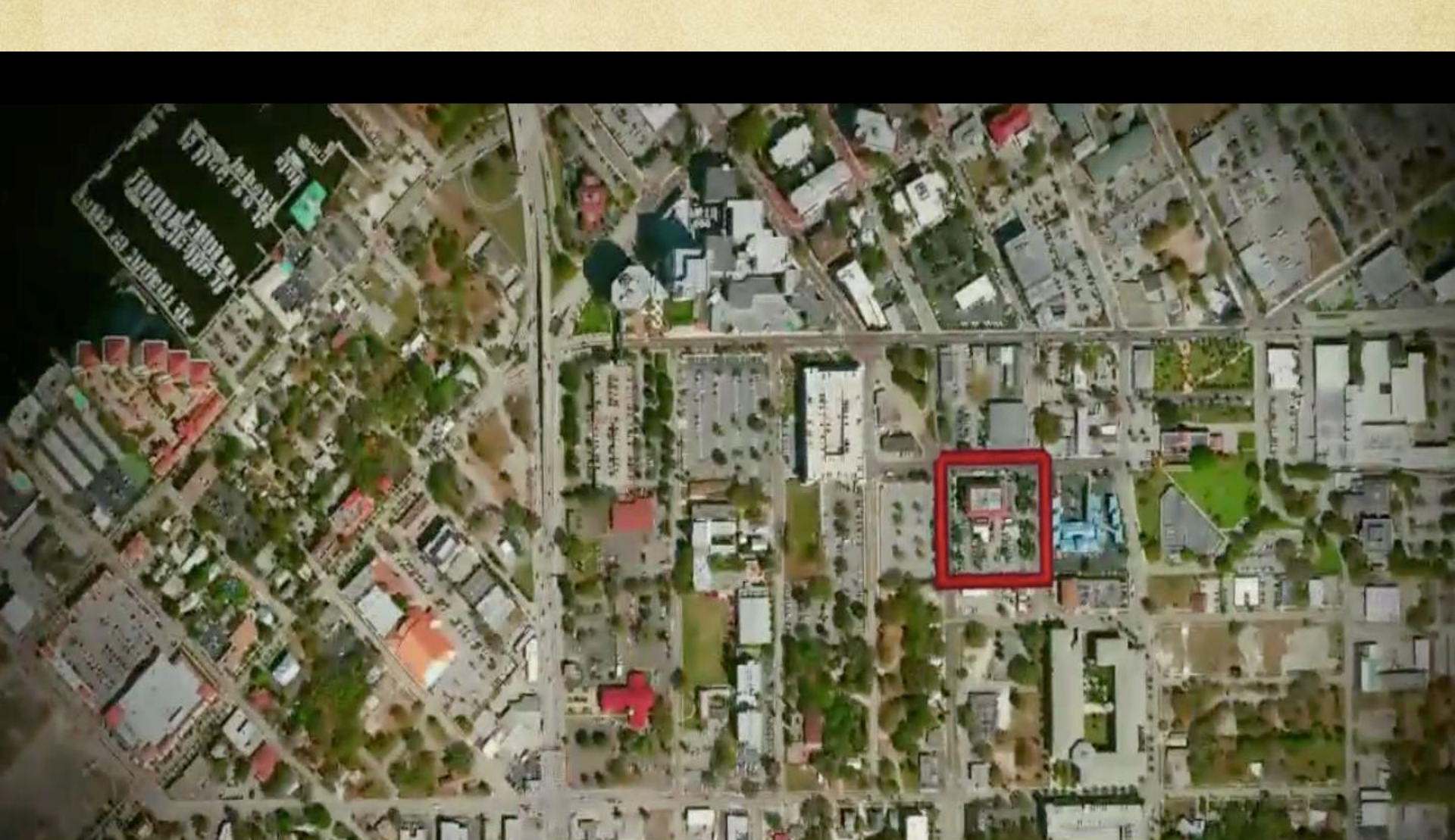
10:16 70°

Map Satellite Heat Map

01:54

03:26

HD



**IN
YOUR
CORNER**

PREDICTIVE POLICING
STOPPING CRIMES BEFORE THEY HAPPEN

FOX 4

10:17 70°

Digital Globe



02:43

03:26



BeWare Programme

The new way police are surveilling you: Calculating your threat 'score' - The Washington Post

17/08/16 13:35

The Washington Post

Public Safety

The new way police are surveilling you: Calculating your threat 'score'

By **Justin Jouvenal** January 10

FRESNO, Calif. — While officers raced to a recent 911 call about a man threatening his ex-girlfriend, a police operator in headquarters consulted software that scored the suspect's potential for violence the way a bank might run a credit report.

The program scoured billions of data points, including arrest reports, property records, commercial databases, deep Web searches and the man's social-media postings. It calculated his threat level as the highest of three color-coded scores: a bright red warning.

The man had a firearm conviction and gang associations, so out of caution police called a negotiator. The suspect surrendered, and police said the intelligence helped them make the right call — it turned out he had a gun.

23

BeWare Programme

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Automated Inference on Criminality using Face Images

- automated face-induced inference on criminality
- based on still face images of 1856 real persons (half convicted)
- Computer vision and pattern recognition

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Automated Inference on Criminality using Face Images



(a)



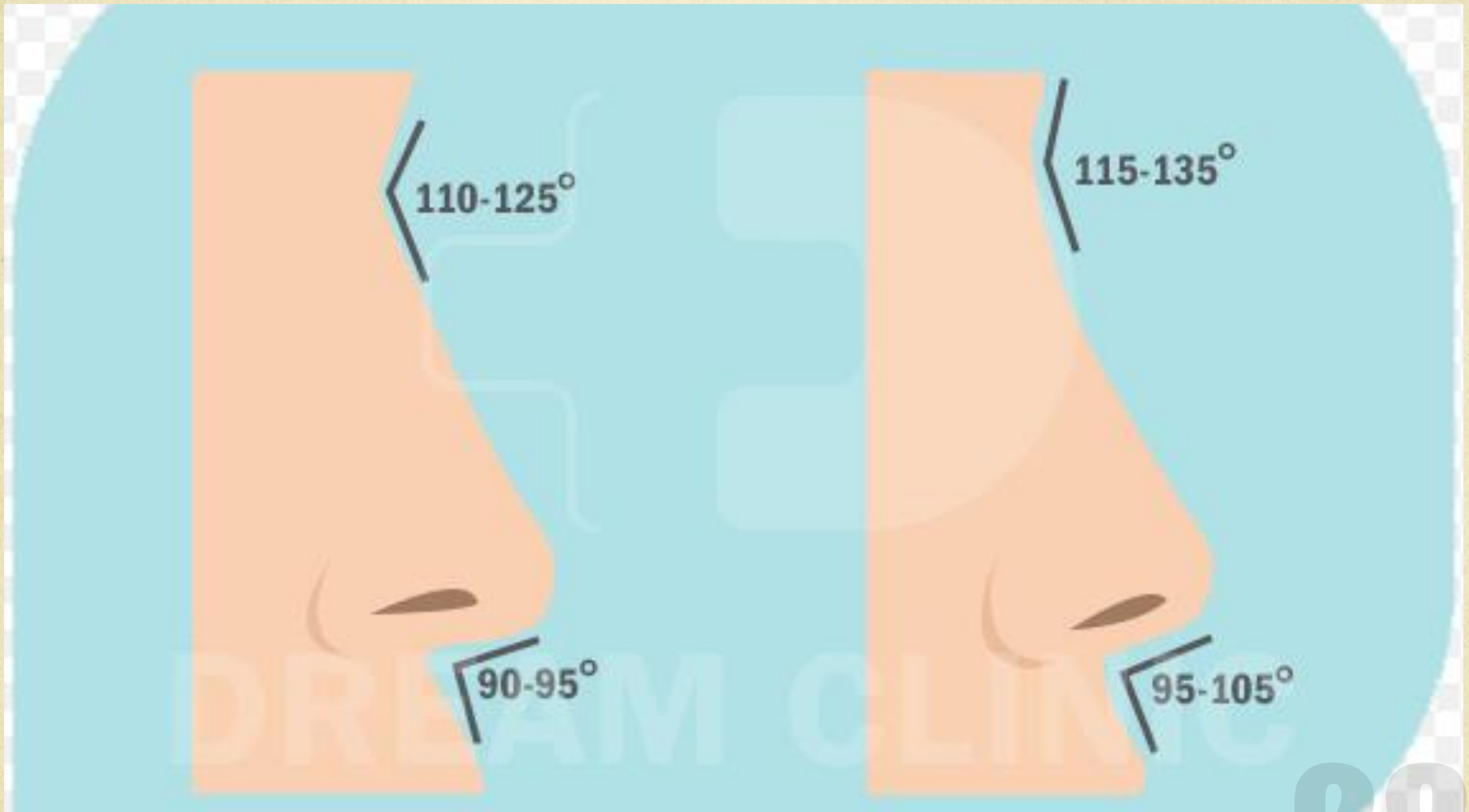
(b)

Figure 9. (a) The four subtypes of criminal faces; (b) The three subtypes of non-criminal faces.

Automated Inference on Criminality using Face Images

Features for predicting criminality:

- lip curvature
- eye inner corner distance, and
- nose-mouth angle



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Challenges and risks

1

Building algorithms: humans craft them; may encode errors and biases; data needs to be collected, cleaned, data sets gathered; several prior decisions have to be made.

Challenges and risks

2

Functioning of algorithms:

e.g. discrimination may be an artefact of the data mining process itself, rather than a result of programmers assigning certain factors inappropriate weight. Biases may be directly excluded, but can be calculated indirectly. (cf. Barocas & Selbst, 2015)

Challenges and risks

1 Building of algorithms – CASE

- Natural language necessarily contains human biases (Caliskan-Islam, Bryson, Narayanan, 2016)
- Sentencing prediction instruments (ProPublica, 2016)

Challenges and risks

ProPublica

Florida risk scores algorithm (Northpointe)

assessment tool correctly predicts recidivism 61 percent of the time

Challenges and risks

ProPublica: Machine Bias

But blacks are almost twice as likely as whites to be labeled a higher risk but not actually re-offend. The opposite mistake among whites: They are much more likely than blacks to be labeled lower risk but go on to commit other crimes.

Prediction Fails Differently for Black Defendants

	WHITE	AFRICAN AMERICAN
Labeled Higher Risk, But Didn't Re-Offend	23.5%	44.9%
Labeled Lower Risk, Yet Did Re-Offend	47.7%	28.0%

Challenges and risks

- Ad infinitum problem

Challenges and risks

- Ad infinitum problem
- “The eternal past” or vicious circle effect
- Self-fulfilling prophecies

Challenges and risks

Blurring probability, causality, and certainty

- “risk assessment”
- Correlation v. certainty

5 Concluding...

Blurring boundaries:

- suspect, accused, convicted
- Due process safeguards

Transition from *ex post facto* punishment system

to *ex ante* preventive measures



5 Concluding...

Consequences

- Legal evolution
- Place of subjectivity and case-specific narrative
- Division of power



Thank you
for your attention!

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Criminology: living by its early promises?



Criminology: early promises?

- Statistics as a cornerstone of early criminology (Garland, 1985)
- Scientific understanding of crime v. *ancient regime* superstition



Positivist school

Auguste Comte (1798-1857), sociologist

Adolphe Quetelet (1796-1874), mathematician

André-Michel Guerry (1802-1866), lawyer, statistician

Crimes contre les personnes

Essay on moral statistics of France

(Guerry, 1832)

Choropleth map

