

Criminal Machine Learning

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Privacy, Security and ethical aspects of data

Université Cote d'Azur

Criminal Machine Learning



The following slides are from the instructors Carl T. Bergstrom and Jevin West

Course: INFO 198 / BIOL 106B. University of Washington

Available online:

- <https://www.youtube.com/watch?v=rga2-d1oi30>
- <https://www.youtube.com/watch?v=4u6HGax90A>

Are you a criminal based on your face?

Automated Inference on Criminality using Face Images

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(a) Three samples in criminal ID photo set S_c .



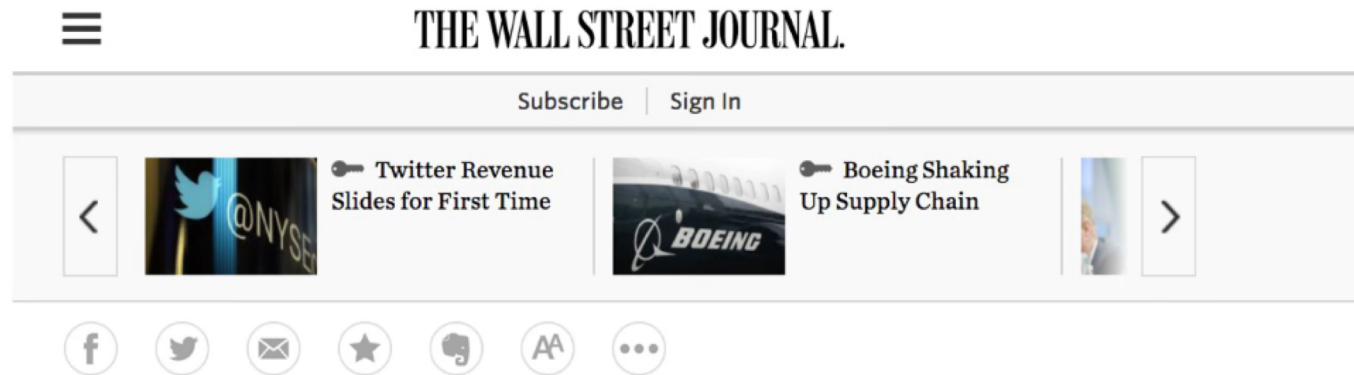
(b) Three samples in non-criminal ID photo set S_n

Algorithms are as biased as the training data coming from humans!

“Unlike a human examiner/judge, a computer vision algorithm or classifier has absolutely no subjective baggages [sic], having no emotions, no biases whatsoever due to past experience, race, religion, political doctrine, gender, age, etc., no mental fatigue, no preconditioning of a bad sleep or meal. The automated inference on criminality eliminates the variable of meta-accuracy (the competence of the human judge/examiner) all together.”

—Wu & Zhang(2017)

One possible reason: your attractiveness influences your chance of being convicted...



LAW BLOG

U-G-L-Y, You Might Have an Alibi, But You're Guilty, You're Guilty!

By [ASHBY JONES](#)

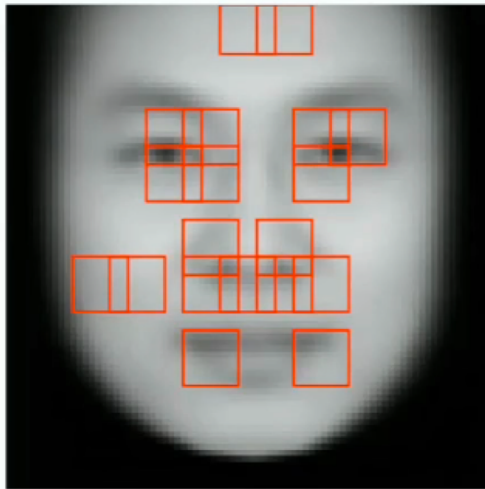
May 17, 2010 1:25 pm ET

A new study from Cornell reveals something rather disturbing: physically unattractive criminal defendants are 22 percent more likely to be convicted and hit with longer sentences than physically attractive defendants.

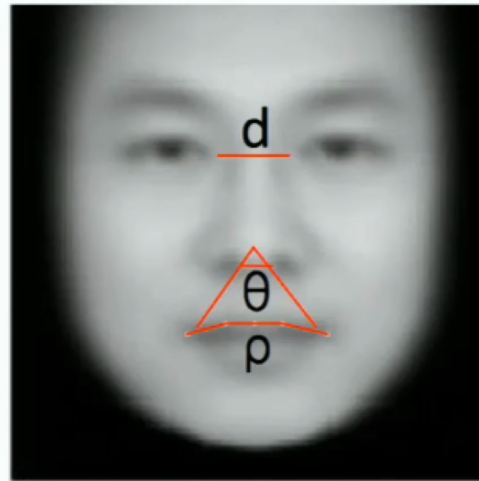
Click [here](#) for the story from the Cornell Chronicle; [here](#) for a story from the Cornell Daily Sun.



Criminals have smaller angle θ , larger curvature ρ than non-criminals.



(a)



(b)

Figure 8. (a) FGM results; (b) Three discriminative features ρ , d and θ .

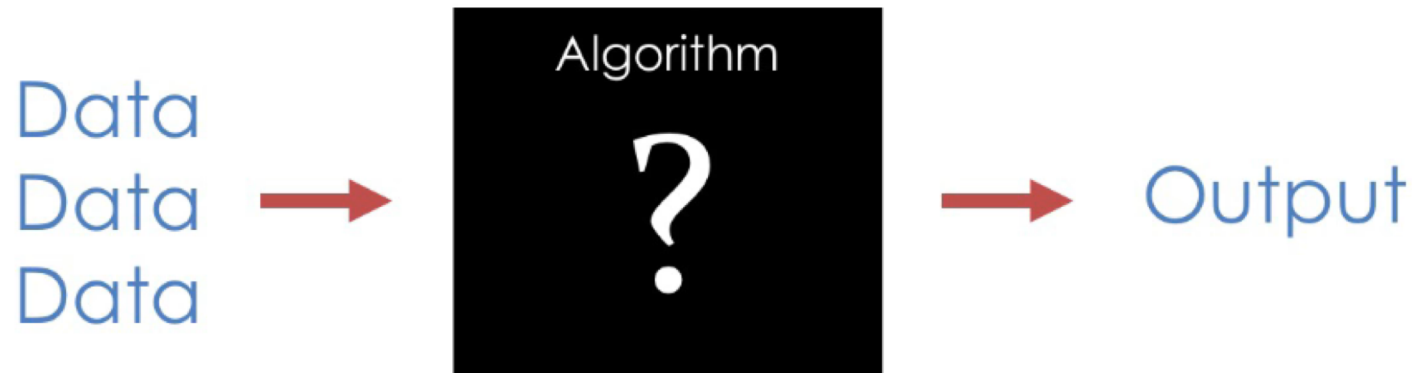
Because they are smiling!



(a) Three samples in criminal ID photo set S_c .



(b) Three samples in non-criminal ID photo set S_n



Even when you don't know how an algorithm or statistical test works, you can spot bullshit by looking carefully at what goes in and what comes out.

Garbage In, Garbage Out



Algorithms are as biased as the training data coming from humans!

“Unlike a human examiner/judge, a computer vision algorithm or classifier has absolutely no subjective baggages [sic], having no emotions, no biases whatsoever due to past experience, race, religion, political doctrine, gender, age, etc., no mental fatigue, no preconditioning of a bad sleep or meal. The automated inference on criminality eliminates the variable of meta-accuracy (the competence of the human judge/examiner) all together.”

—Wu & Zhang(2017)

Algorithmic Bias



Ad Discrimination

Ads related to latanya farrell

Latanya Farrell Arrested?
www.instantcheckmate.com/
 1) Enter Name and State. 2) Access Full Background Checks Instantly.

Latanya Farrell
www.publicrecords.com/
 Public Records Found For: Latanya Farrell. View Now.

(a)

checkmate Instant Background Checks DASHBOARD EDIT ACCOUNT INFO LOGOUT

LATANYA FARRELL
 40 Lexington Rd
 West Hartford, CT 06119
 DOB: Jun 10, 1972 (40 years old)

Personal
 Name, aliases, birthdate, phone numbers, etc.

Location
 Decided address history and related data, maps, etc.

Related Persons
 Known family members, business associates, roommates, etc.

Marriage / Divorce
 Marriage and divorce records on file...

Criminal History
 Arrest records, speeding tickets, mugshots, etc.

Licenses
 FAA licenses, DEA licenses, Other Licenses, etc.

Sex Offenders
 Sex offenders living near Latanya Farrell's primary location.

Criminal History Rate This Content: ☆☆☆☆☆

This section contains possible citation, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clean slate here should not be interpreted as a guarantee that Latanya Farrell has never been arrested; it simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
No matching arrest records were found.			

Ads related to Jill Schneider

Jill Schneider Ad
www.posters3prints.com/
 Custom Frame Prints and Canvas. Shop Now, SAVE Big + Free Shipping!

We Found Jill Schneider
www.intellus.com/
 Current Phone, Address, Age & More. Instant & Accurate Jill Schneider
 10,256 people + 111 this page
[Reverse Lookup](#) - [Reverse Cell Phone Directory](#) - [Data Check](#) - [Property Records](#)

Located: Jill Schneider
www.instantcheckmate.com/
 Information found on Jill Schneider Jill Schneider found in database.

(a)

checkmate Instant Background Checks DASHBOARD EDIT ACCOUNT INFO LOGOUT

JILL SCHNEIDER
 11917 79th St
 Kansas City, MO 64118
 DOB: Mar 31, 1963 (43 years old)

Personal
 Name, aliases, birthdate, phone numbers, etc.

Location
 Decided address history and related data, maps, etc.

Related Persons
 Known family members, business associates, roommates, etc.

Marriage / Divorce
 Marriage and divorce records on file...

Criminal History
 Arrest records, speeding tickets, mugshots, etc.

Licenses
 FAA licenses, DEA licenses, Other Licenses, etc.

Sex Offenders
 Sex offenders living near Jill Schneider's primary location.

Criminal History Rate This Content: ☆☆☆☆☆

This section contains possible citation, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clean slate here should not be interpreted as a guarantee that Jill Schneider has never been arrested; it simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
1 Jill E Schneider	WI Admin Office of Courts(CM)	Criminal Traffic	View Details
2 Jill E Schneider	WI Admin Office of Courts(CM)	Criminal Traffic	View Details
3 Jill E Schneider	WI Admin Office of Courts(CM)	Criminal Traffic	View Details
4 Jill E Schneider	WI Admin Office of Courts(CM)	Criminal Traffic	View Details

Sweeney, Latanya. "Discrimination in online ad delivery." Queue 11.3 (2013): 10.

Ad Discrimination

Google search for
Latanya Farrell,
Latanya Sweeney, and
Latanya Lockett

FIGURE 1

Sample Ads and Criminal Reports

A

Ads related to latanya farrell ①
[Latanya Farrell, Arrested?](http://www.instantcheckmate.com/)
www.instantcheckmate.com/
1) Enter Name and State. 2) Access Full Background Checks Instantly.

[Latanya Farrell](http://www.publicrecords.com/)
www.publicrecords.com/
Public Records Found For: **Latanya Farrell**. View Now.

C

Ad related to latanya sweeney ①
[Latanya Sweeney Truth](http://www.instantcheckmate.com/)
www.instantcheckmate.com/
Looking for **Latanya Sweeney**? Check **Latanya Sweeney's** Arrests.

D

Latanya Sweeney
1840 Cedar Ave
Peabody, MA 01960
DOB: Dec 27, 1989 (35 years old)

Criminal History
This section contains possible citation, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clean state here should not be interpreted as a guarantee that Latanya Sweeney has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
No matching arrest records were found.			

F

Latanya Lockett
1840 Cedar Ave
Peabody, MA 01960
DOB: Sep 11, 1979 (37 years old)

Criminal History
This section contains possible citation, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clean state here should not be interpreted as a guarantee that Latanya Lockett has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
1. Latanya Lockett Lockett	OK Crime Cases (Courtbook) data	Connecticut	View Details
2. Latanya Lockett Lockett	OK Crime Cases County	Connecticut	View Details
3. Latanya Lockett Lockett	OK Crime Superior Court	Connecticut	View Details
4. Latanya Lockett Lockett	OK Crime Superior Court	Connecticut	View Details

B

Latanya Farrell
1840 Cedar Ave
Peabody, MA 01960
DOB: Jan 15, 1972 (39 years old)

Criminal History
This section contains possible citation, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clean state here should not be interpreted as a guarantee that Latanya Farrell has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
No matching arrest records were found.			

C

Ads by Google
[Latanya Sweeney, Arrested?](http://www.instantcheckmate.com/)
1) Enter Name and State. 2) Access Full Background Checks Instantly.
www.instantcheckmate.com/

[Latanya Sweeney](http://www.publicrecords.com/)
Public Records Found For: **Latanya Sweeney**. View Now.
www.publicrecords.com/

[La Tanya](http://www.ask.com/La+Tanya)
Search for La Tanya Look Up Fast Results now!
www.ask.com/La+Tanya

E

Ads related to latanya lockett ①
[We Found:Tanya Lockett](http://www.peoplesmart.com/)
www.peoplesmart.com/
1) Get Tanya **Lockett's** Info - Try Free! 2) Current Phone, Address & More.

[Latanya Lockett, Arrested?](http://www.instantcheckmate.com/)
www.instantcheckmate.com/
1) Enter Name and State. 2) Access Full Background Checks Instantly.

[Latanya Lockett Found](http://www.whitepages.com/Latanya+Lockett)
www.whitepages.com/Latanya+Lockett
Don't Pay for Info that's Free, Get Address, Phone, Photos, & More!
Name Popularity & Facts - Neighbor Search - Reverse Phone Lookup

Ad Discrimination

Google search for
Jill Foley,
Jill Schneider, and
Jill James

FIGURE 3

Sample Ads and Criminal Reports for Names that Include the First Name “Jill”

A

Ads by Google

Located: Jill Foley
Information found on Jill Foley Jill Foley found in database.
www.instantcheckmate.com/

Macy's® Wedding Registry
Official Site. Create a Registry or Buy a Wedding Gift at Macy's!
www.macys.com/Registry/Wedding
macys.com is rated ★★★★★ (82 reviews)

Dr. Jill Foley
View Credentials, Malpractice, Bio, Ratings, Reviews & Background Now!
www.lifescript.com/MD

B

JILL FOLEY
1610 S. 10th St.
Tomball, TX 77375
DOB: Jul 31, 1964 (59 years old)

Criminal History
This section contains possible criminal, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clear state here should not be interpreted as a guarantee that Jill Foley has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
1. Jill Lee Foley	TX, Pinellas County	Domestic Violence	View Details
2. Jill Lee Foley	TX, Pinellas County	Domestic Violence	View Details

C

Ads related to Jill Schneider ⓘ

Jill Schneider Art
www.posters2prints.com/
Custom Frame Prints and Canvas. Shop Now, SAVE Big + Free Shipping!

We Found Jill Schneider
www.intelius.com/
Current Phone, Address, Age & More. Instant & Accurate Jill Schneider
10,256 people + 1'd this page
Reverse Lookup - Reverse Cell Phone Directory - Date Check - Property Records

Located: Jill Schneider
www.instantcheckmate.com/
Information found on Jill Schneider Jill Schneider found in database.

D

JILL SCHNEIDER
Vista Ridge Dr.
Kennesaw, GA 30144
DOB: Mar 21, 1969 (55 years old)

Criminal History
This section contains possible criminal, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clear state here should not be interpreted as a guarantee that Jill Schneider has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
1. Jill E Schneider	GA, Adams Office of Court/CDC	Domestic Violence	View Details
2. Jill E Schneider	GA, Adams Office of Court/CDC	Domestic Violence	View Details
3. Jill E Schneider	GA, Adams Office of Court/CDC	Domestic Violence	View Details
4. Jill E Schneider	GA, Adams Office of Court/CDC	Domestic Violence	View Details

E

Ad related to Jill James ⓘ

Located: Jill James
www.instantcheckmate.com/
Information found on Jill James Jill James found in database.

F

JILL JAMES
1610 S. 10th St.
Tomball, TX 77375
DOB: May 31, 1965 (59 years old)

Criminal History
This section contains possible criminal, arrest, and criminal records for the subject of this report. While our database does contain hundreds of millions of arrest records, different counties have different rules regarding what information they will and will not release.

We share with you as much information as we possibly can, but a clear state here should not be interpreted as a guarantee that Jill James has never been arrested. It simply means that we were not able to locate any matching arrest records in the data that is available to us.

Possible Matching Arrest Records

Name	County and State	Offenses	View Details
1. Jill S James	NC, Adams Office of Court/CDC	Domestic Violence	View Details
2. Jill James	NC, Adams Office of Court/CDC	Domestic Violence	View Details
3. Jill James	Individual NC courts	Domestic Violence	View Details
4. Jill S James	Individual NC courts	Domestic Violence	View Details
5. Jill Pats James	Individual NC courts	Domestic Violence	View Details
6. Jill Pats James	NC, Adams Office of Court/CDC	Domestic Violence	View Details
7. Jill Pats James	NC, Adams Office of Court/CDC	Domestic Violence	View Details

Gender Bias



Percentage of women in top 100 Google image search results for CEO: 11%

Percentage of U.S. CEOs who are women: 27%

Kay, Matthew, Cynthia Matuszek, and Sean A. Munson. "Unequal representation and gender stereotypes in image search results for occupations." *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM, 2015.

Translation Bias



Caliskan, Aylin, Joanna J. Bryson, and Arvind Narayanan. "Semantics derived automatically from language corpora contain human-like biases." *Science* 356.6334 (2017): 183-186.

Calling Bullshit on Machine Injustice

*Scientific method is not dead
Machines are NOT bias-free
Garbage in, Garbage out
Fallibility of machines
Algorithmic Ethics*

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