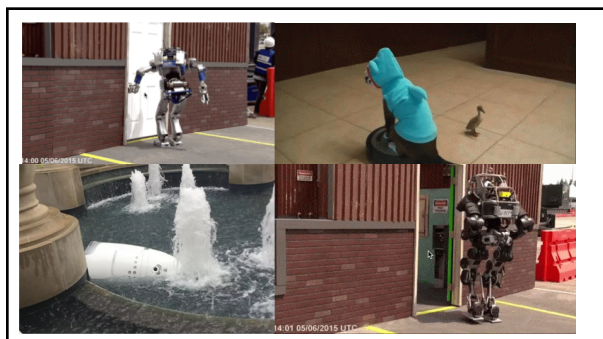
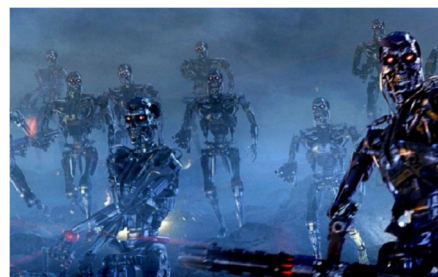


Data Science 100

Lecture 27: Ethics in Data Science

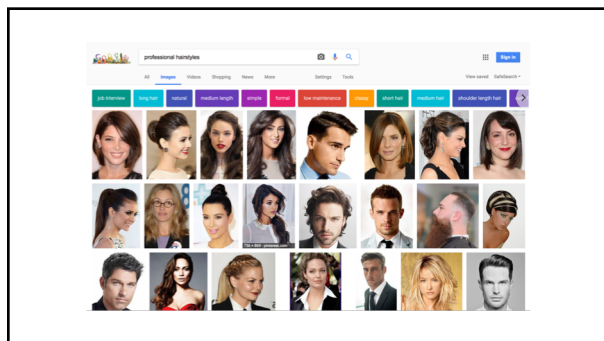
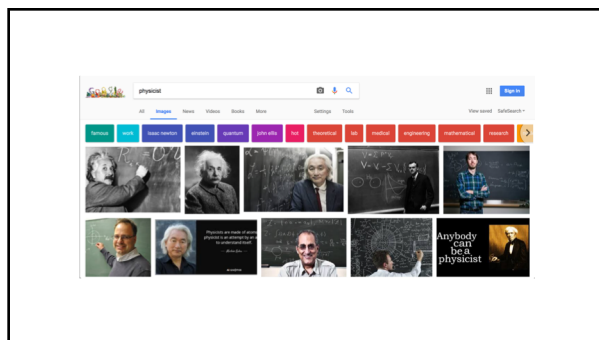
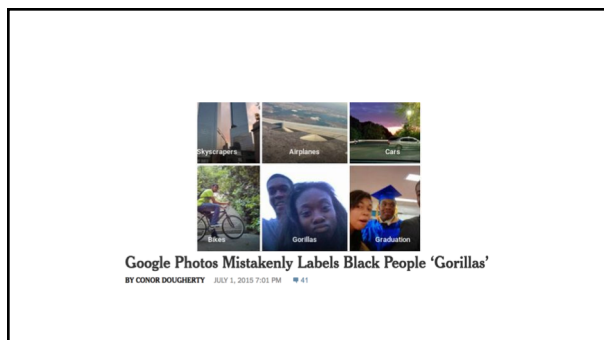
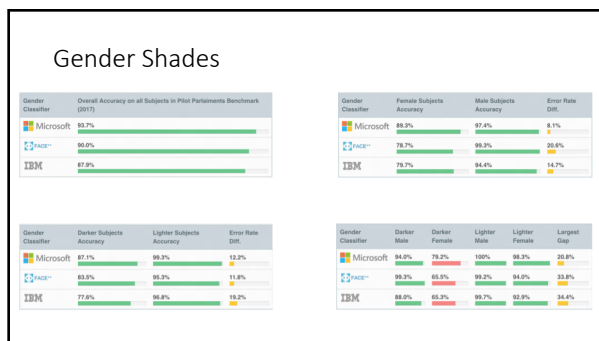
Slides by:
Joshua Kroll
kroll@berkeley.edu



HP Face-Tracking Webcams Don't Recognize Black People

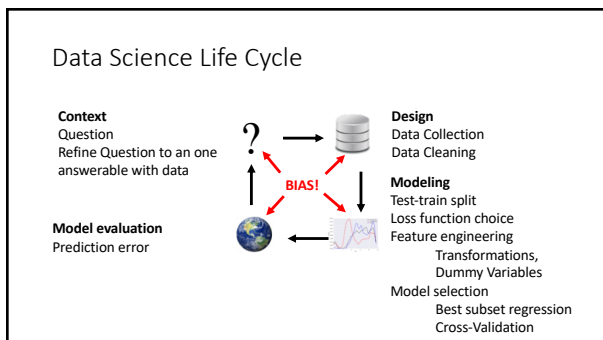
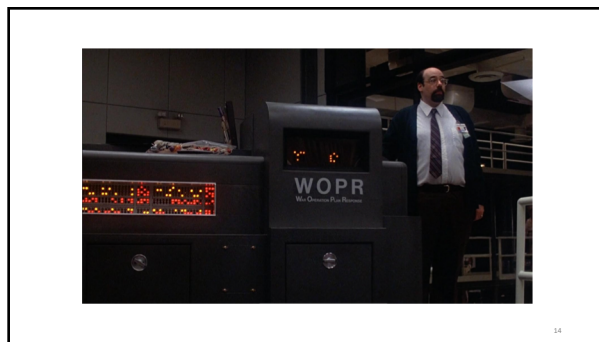
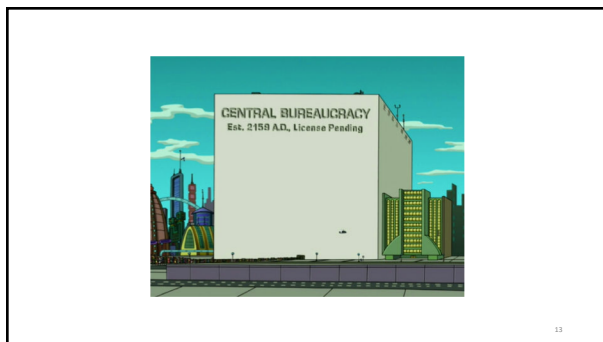
Adam Fraczi
12/21/09 10:00am • Filed to: WEBCAMS

154.6K 291



Data science is everywhere...

- Scoring Systems: FICO
- Lotteries: [Logo]
- Criminal Justice & National Security: TSA Pre✓, [Logo]
- ChexSystems
- News: ai AUTOMATED INSIGHTS
- Lending: zest finance, earnest
- Hiring: gild, TolentBin, GJ
- NarrativeScience
- Kabbage
- Affirm
- entelo



Context & Refinement

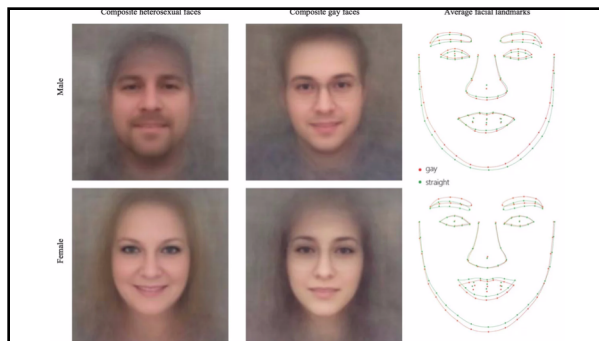
Extreme Digital Vetting of Visitors to the U.S. Moves Forward Under a New Name

ICE officials have invited tech companies, including Microsoft, to develop algorithms that will track visa holders' social media activity.

by George Joseph, Nov. 22, 8 a.m. EST

Context & Refinement

A Stanford scientist says he built a gaydar using "the lamest" AI to prove a point



Proxies

Automated Inference on Criminality using Face Images

Xiaolin Wu
McMaster University
Shanghai Jiao Tong University
wuxl30@gmail.com

Xi Zhang
Shanghai Jiao Tong University
zhangxi.19930818@sjtu.edu.cn

High IQ Academic Researcher Professional Poker Player Terrorist

Data Collection

Street Bump About

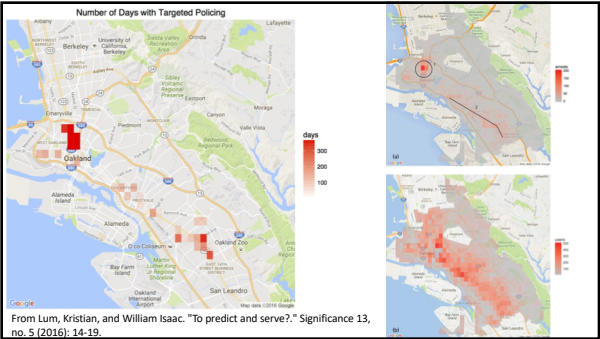
Help keep your streets smooth

RECORD A TRIP

MY TRIPS

Data Collection

<http://bit.ly/ds100-sp18-eth>





Data Cleaning






PAUL REUBENS PETER PAUL RUBENS ZAREK SAREK ZAREK

Data Cleaning

Data Cleaning


Test-Train Split



Loss Function Choice

DOES UNCONSCIOUS RACIAL BIAS AFFECT TRIAL JUDGES?

Jeffrey J. Rachlinski, Sheri Lynn Johnson,† Andrew J. Wistrich,‡ & Chris Guthrie††*

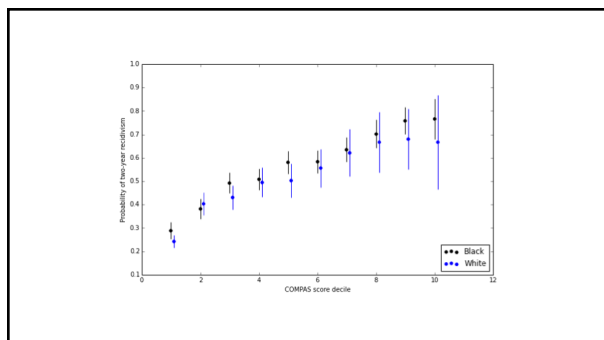
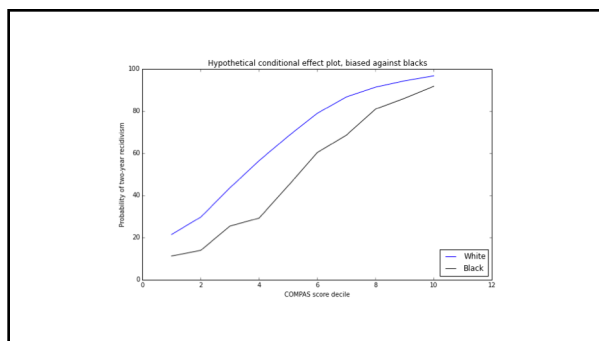
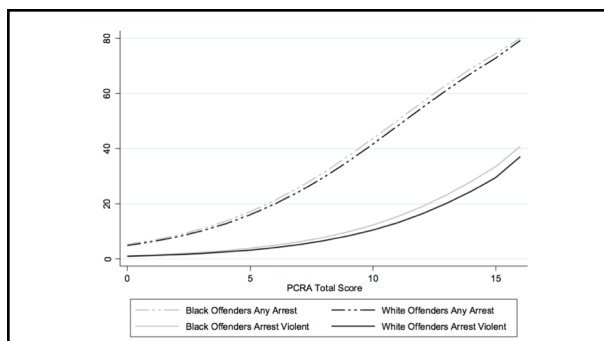


Machine Bias

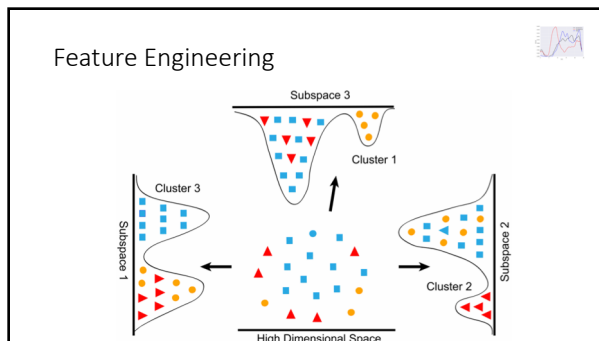
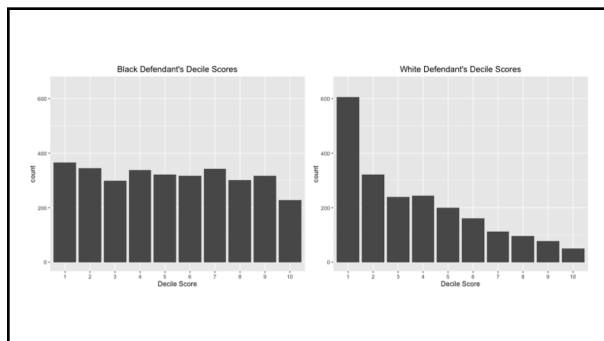
There's software used across the country to predict future criminals. And it's biased against blacks.

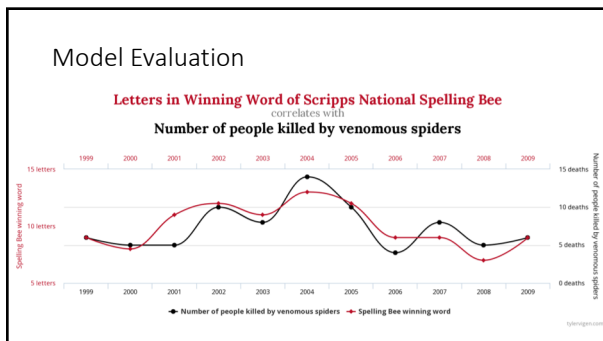
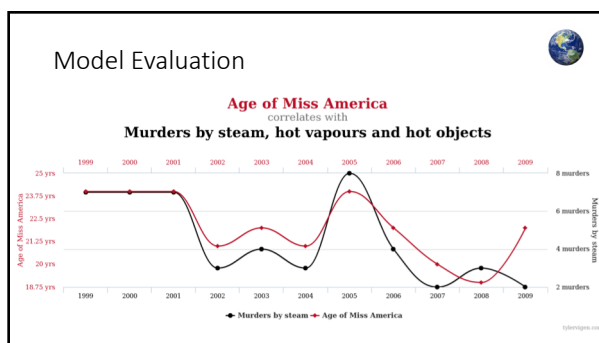
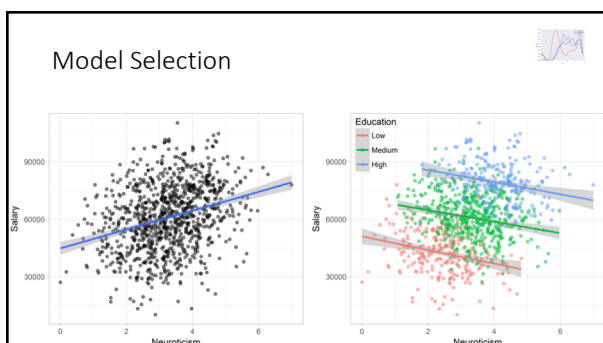
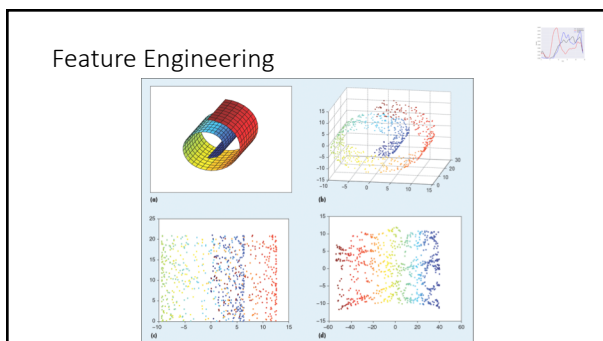
by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica
May 23, 2016

ON A SPRING AFTERNOON IN 2014, Brisha Borden was running late to pick up her god-sister from school when she spotted an unlocked kid's blue Huffy bicycle and a silver Razor scooter. Borden and a friend grabbed the bike and scooter and tried to ride them down the street in the Fort Lauderdale suburb of Coral Springs.



So why does ProPublica think COMPAS is biased?





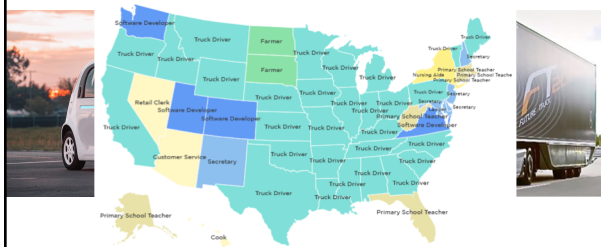
So what do we do about this?

Ethical Lessons

1. Know what the data are telling you
 - Understand your model, and validate it
 - Involve domain experts; "raw data" is an oxymoron
 - Communicate not just model *capabilities*, but also *limits* and *assumptions*
2. Data about people are about people
 - The data do not exist on their own, someone made them
3. Always consider why your model might be wrong in systematic ways
 - Don't just **trust** the technology, make it **trustworthy**
 - **Close** the data science lifecycle: the world changes, and so should your models

Ethics beyond the Data Science Lifecycle

Should we deploy technology at all?



When is it ethical to collect data?



When is it ethical to collect sensitive data?

- Without knowing sensitive attributes, it's not possible to know how to make good decisions.
 - E.g., in a credit-granting context, there's no reason to believe that qualified minority applicants will be similar to qualified members of the majority
- But having sensitive data means it can be repurposed for other uses

Inclusion and Representation



Resources

- Take a course at Berkeley on people and technology
- Visit <https://fatml.org> and <https://fatconference.org>
 - Reading list
 - Principles for Accountable Algorithms
- Books
 - *Weapons of Math Destruction*, by Cathy O'Neil
 - *How to Lie With Statistics*, by Darrell Huff
- Courses around the world: tinyurl.com/ethics-classes

*"Remember that all models are wrong;
the practical question is how wrong do
they have to be to not be useful."*

-George E. P. Box

