# Weapons of math destruction

## Chapter 1

- Must ask who designed the model but also what that person or company is trying to accomplish
- A model built today will work a bit worse tomorrow - stale
- Good models can be primitive - ex, model for detecting fires weighs only one strongly correlated variable - the presence of smoke
- Racism - on the individual level can be seen as a predictive model in human minds, built from faulty incomplete or generalized data, data indicates that certain types of people behave badly - generates a binary prediction that all people of that race will behave the same way - one model morphs into a belief, it becomes hardwired and generates poisoned assumptions yet rarely tests them settling instead for data that seems to confirm and fortify them
- Racism is the most slovenly of predictive models - powered by haphazard data gathering and specious correlations reinforced by institutional inequalities and polluted by confirmation bias
- You might think computerized risk models Fed by data would reduce the role of prejudice in sentencing and contribute to more even handed treatment - courts have turned to recidivism models _ helps judges assess the danger posed by each convict - an improvement keeping sentences more consistent + save money by nudging down length of average sentence
- Still remains a question is we have eliminated human bias or simply camouflaged it with technology - complicated and mathematical + have bias that is not written in words but in algorithms which is intelligible to only a few elite
- 3 types of models: baseball = healthy(transparent and continuously updated with both assumptions and the conclusions clear for all to see - feed an stats not proxies, people being modeled understand the process and share the model's objective ) , family meal plan = healthy because not enforced an others, recidivism = bad
- WMD taxonomy exercise:
    - Even if the participant is aware of being modeled, or what the model is used for, is the model opaque, or even invisible?
    - Even when models behave themselves, opacity can lead to a feeling of unfairness - transparency matters
    - [illegible]

- Many companies hide results of models - business secrets (intellectual property)
- WMDs are by design black boxes
- Does The model work against the subjects interest? Is it unfair? Does it damage or destroy lives?
- Does a model have the capacity to grow exponentially (can it scale)? - establishing broad norms that exert upon us something close to the power of law
- 3 elements of WMD: opacity, scale, damage
- Universally damaging?

## Chapter 4

Propaganda machine: online advertising

- One perspective is that most people objected to advertisements because they were irrelevant to them
- Internet as great equalizing and democratizing force - universities targeting poorer populations advertising upward mobility
- Ads that pinpoint people in great need and sell-them false or overpriced promises - feasting on inequality
- Perpetuating our existing social stratification
- Anywhere you see great need and ignorance = predatory ads
- Predatory advertiser
- False road to prosperity + immense and nefarious feedback loops
- Targets (victims) have little idea how they were scammed because the campaigns are opaque
- isolated, impatient, individuals with low self esteem, low familial support, stack, unable to plan well for the future
- Unlawful, unfair, and fraudulent
- Venerability is worth gold
- Predatory advertisers, customer ignorance
- Use private information against them
- Find where they suffer the most, pain point - most people disclose pain points when googling
- Deal with people who live in the moment for the moment
- Decisions are based more on emotion than logic
- To optimize recruiting and revenue they need to know whom their messages reach and impact they had
- Data scientists use a Bayesian approach (stats) -rank variables with the most impact on desired outcome
- Effectiveness of strategy = probability
- Because various messaging campaigns all interact - much impact therefore cannot be measured
- Easier to track online messaging
- Mail = 1% response rate is a win

- Internet provides advertisers with the greatest laboratory for consumer research and lead generation
- Machine learning = arm of ai
- Foreign language students = language teems with exceptions slang and sarcasm
- Complexity of language is a programmers nightmare
- Internet has produced words about over life and work = greatest training corpus for natural language machines
- Program learns patterns of people and predicts next move
- If the program is predatory, it gauges their weakness and vulnerabilities and pursues the most efficient path to exploit them
- "lead generation " online targeting - goal is to come up with lists of prospects that can be sold
- Crucial metric is the 90-10 rule included in the higher education act of 1965 - stipulates that colleges cannot get more than 90% of funding from federal aid - belief that students would take education more seriously if they had shinin to game

1. Color (Civil Rights Act of 1964, 1991)
2. Sex (Equal Pay Act of 1963; Civil Rights Act of 1964, 1991)
3. Religion (Civil Rights Act of 1964, 1991)
4. National origin (Civil Rights Act of 1964, 1991)
5. Citizenship (Immigration Reform and Control Act)
6. Age (Age Discrimination in Employment Act of 1967) (over 40)
7. Pregnancy (Pregnancy Discrimination Act)
8. Familial status (Civil Rights Act of 1968)
9. Disability status (Rehabilitation Act of 1973; Americans with Disabilities Act of 1990)
10. Veteran status (Vietnam Era Veterans' Readjustment Assistance Act of 1974; Uniformed
11. Services Employment and Reemployment Rights Act)
12. Genetic information (Genetic Information Nondiscrimination Act)

Chapter 3

- Ranking colleges
    - Started sending surveys to college professors - opinion surveys
    - College admin unhappy with rankings
    - Models ideal because focused an outcomes
    - Picked proxies that correlated with success
    - Rankings were self-reinforcing
    - When you create a model from proxies, it is far simpler for people to game it because proxies are easier to manipulate than the complicated reality tag represents - can cause a false positive
    - Collection of human opinion - prejudice and ignorance -ie favors older institutions

with long standing reputations over smaller institutions

- "the flutie" effect - hail many - winning athletic programs boostsapplicants - proud to wear schools name
- A model can force everyone to shoot for exactly the same goals -ratrace - harmful unintended consequences
- Proxies can follow market movement - but that market can be manipulated
- What is the objective of the modeler?
  - how would you know when it worked?
  - It could start with a lat more credibility it it reflected the established hierarchy
  - Validate models, replicating informal models that customers or modelers carried in their own head
- Manage populations like an investment portfolio
  - each item in the model represents a series of assets and a liability or 2,
- Entire industries can thrive off of false feedback loops and anxiety it engenders -