

Gov 50: 1. Introduction

Matthew Blackwell

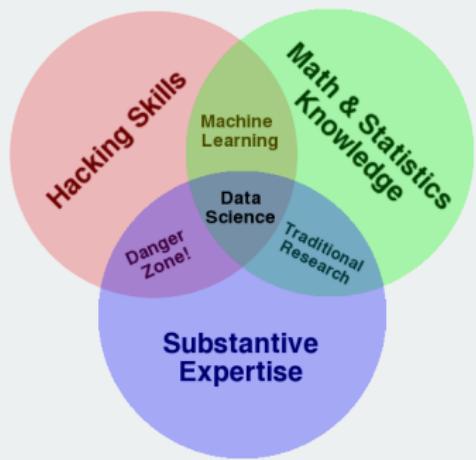
Harvard University

Roadmap

1. Welcome and Motivation
2. Course Details

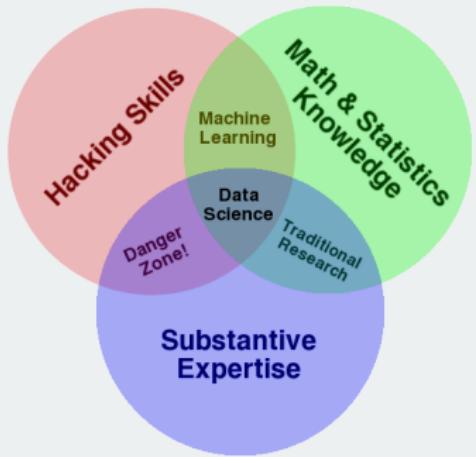
1/ Welcome and Motivation

What is data science?



- **Data science:** wrangling, visualizing, and analyzing data to understand the world

What is data science?



- **Data science:** wrangling, visualizing, and analyzing data to understand the world
- Who does data science? Tech companies, non-tech companies, nonprofits, governments.

Glassdoor's No. 3 best job in the U.S. has seen job growth surge 480%

BY MEGHAN MALAS

March 08, 2022, 1:12 PM

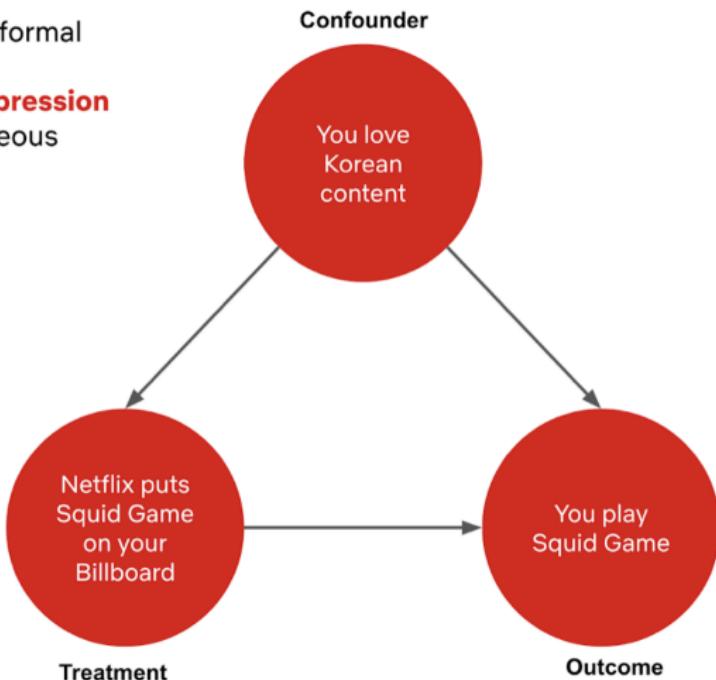


A COMMUTER BOARDS A BAY AREA RAPID TRANSIT (BART) TRAIN IN THE NEW MONTGOMERY STATION IN SAN FRANCISCO, CALIFORNIA, AS SEEN IN MARCH 2022. (PHOTOGRAPHER: DAVID PAUL MORRIS—BLOOMBERG/GETTY IMAGES)

What problems are data scientists working on?

Causality

Causal Inference provides formal tools to tease out the true **incremental** value of an **impression** for each profile: Heterogeneous Treatment Effect (**HTE**)



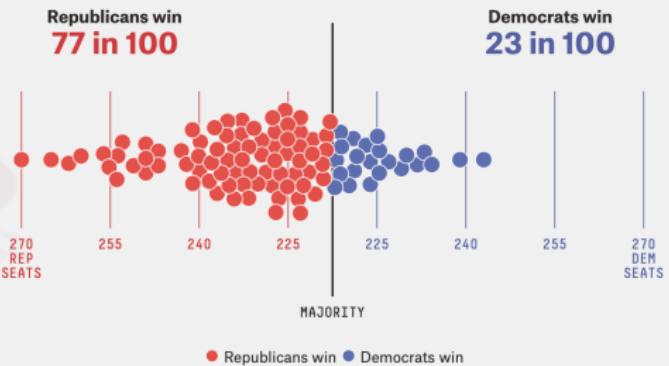
Compared to machine learning, causal inference allows us to build a robust framework that controls for confounders in order to estimate the true incremental impact to members

Prediction

UPDATED 17 MINUTES AGO

Republicans are *favored* to win the House

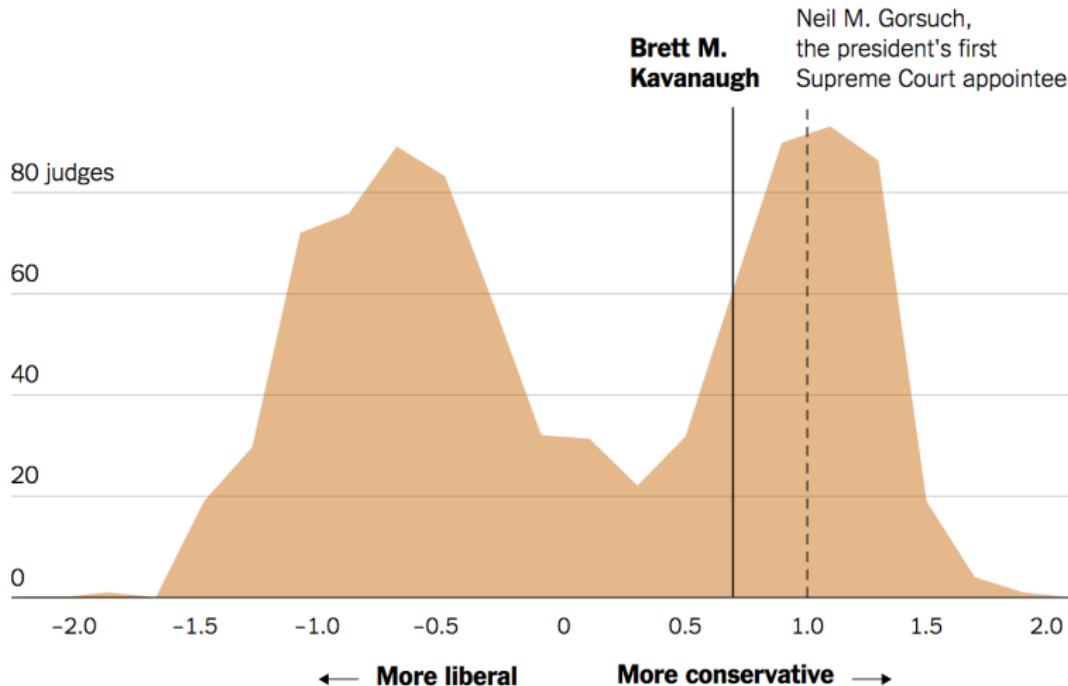
The Deluxe version of our model simulates the election 40,000 times to see which party wins the House most often. This sample of 100 outcomes gives you an idea of the range of scenarios the model considers possible.



We use numbers to express uncertainty. Upset wins are surprising but not impossible.

Measurement

How Kavanaugh's Ideology Compares With Other Federal Judges



Based on the campaign finance scores of all current and former federal district and court of appeals judges nominated since 1980. | Source: Database on Ideology, Money in Politics, and Elections; Adam Bonica, Stanford University

Department of Political Science, Maria Sear, Harvard University, Kennedy School of Government; Adam Chilton and Kyle

Understanding the socioeconomic world

HOME SEARCH

The New York Times

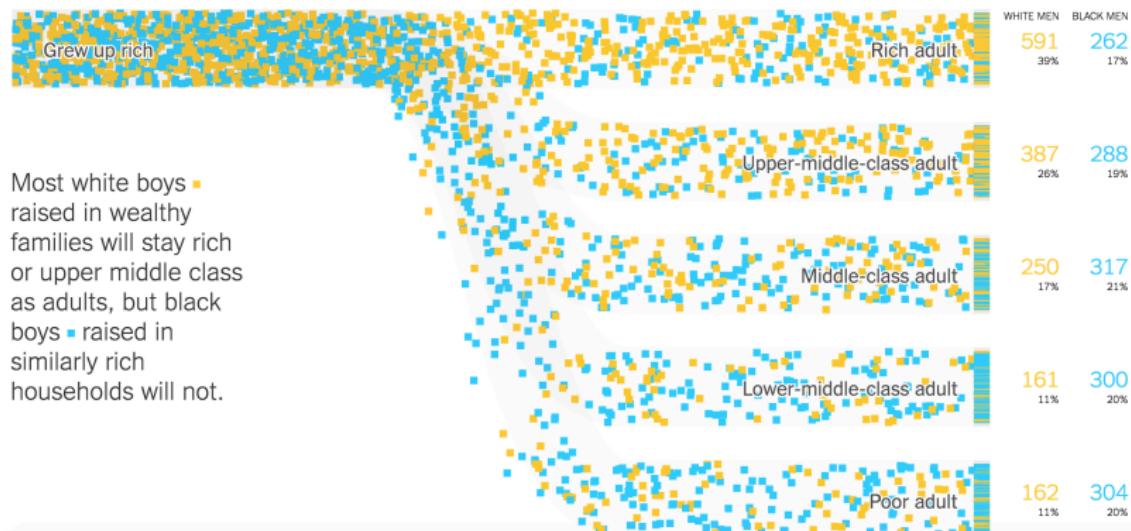
SHARE

Extensive Data Shows Punishing Reach of Racism for Black Boys

By EMILY BADGER, CLAIRE CAIN MILLER, ADAM PEARCE and KEVIN QUEALY MARCH 19, 2018

Follow the lives of 5,734 boys who grew up in rich families ...

...and see where they end up as adults:



Adult outcomes reflect household incomes in 2014 and 2015.

Making government work better

The screenshot shows the CityScore homepage. At the top, there's a navigation bar with links for 'HOME', 'CITYSCORE', 'PUBLIC NOTICES', 'PAY AND APPLY', 'FEEDBACK', and 'TRANSIT'. Below the navigation is a large banner with the 'CITY SCORE' logo. The main content area features a large 'CITYSCORE' heading and a sub-section titled 'THE SCORE' which displays a horizontal scale from 0.0 to 1.0 with a current score of 1.02. A note below the scale says 'Scores below 1 indicate that performance is below the target'.

CITYSCORE

CityScore is an initiative designed to inform the Mayor and city managers about the overall health of the City at a moment's notice by aggregating key performance metrics into one number. Here we will provide you with an overview of the CityScore tool and data, but more importantly we will show you how we are using CityScore to make improvements across the City.

THE SCORE



Topic	Day	Week	Month	QTR
311 CALL CENTER PERFORMANCE			0.94	0.93
CODE ENFORCEMENT ON-TIME %	1.23	1.24	1.24	1.24
CODE ENFORCEMENT TRASH COLLECTION	1.25	1.18	1.15	1.10
GRAFFITI ON-TIME %	0.33	0.13	0.20	0.27
MISSSED TRASH ON-TIME %	1.21	1.20	1.20	1.20
PARKS MAINTENANCE ON-TIME %	0.82	0.83	0.90	0.88
POTHOLE ON-TIME %	1.25	0.88	0.69	0.67
SIGN INSTALLATION ON-TIME %	1.00	0.23	0.24	0.49
SIGNAL REPAIR ON-TIME %	1.25	1.25	1.10	1.09
STREETLIGHT ON-TIME %	0.55	0.60	0.56	0.54
TREE MAINTENANCE ON-TIME %	1.19	1.18	1.17	1.13
ON-TIME PERMIT REVIEWS	0.88	0.88	0.85	0.81
LIBRARY USERS	1.51	1.42	1.43	1.42
BPS ATTENDANCE				0.90
BFD RESPONSE TIME	0.91	0.94	0.94	0.94
BFD INCIDENTS	1.03	0.92	0.93	0.94
EMS RESPONSE TIME	0.90	0.84	0.84	0.84
PART 1 CRIMES	2.26	1.48	1.41	1.40

Combining art and data to inform

Who Gets Miscounted In The Census ?

Black

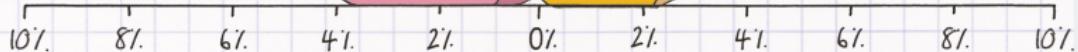


Hispanic

Native
American

Asian

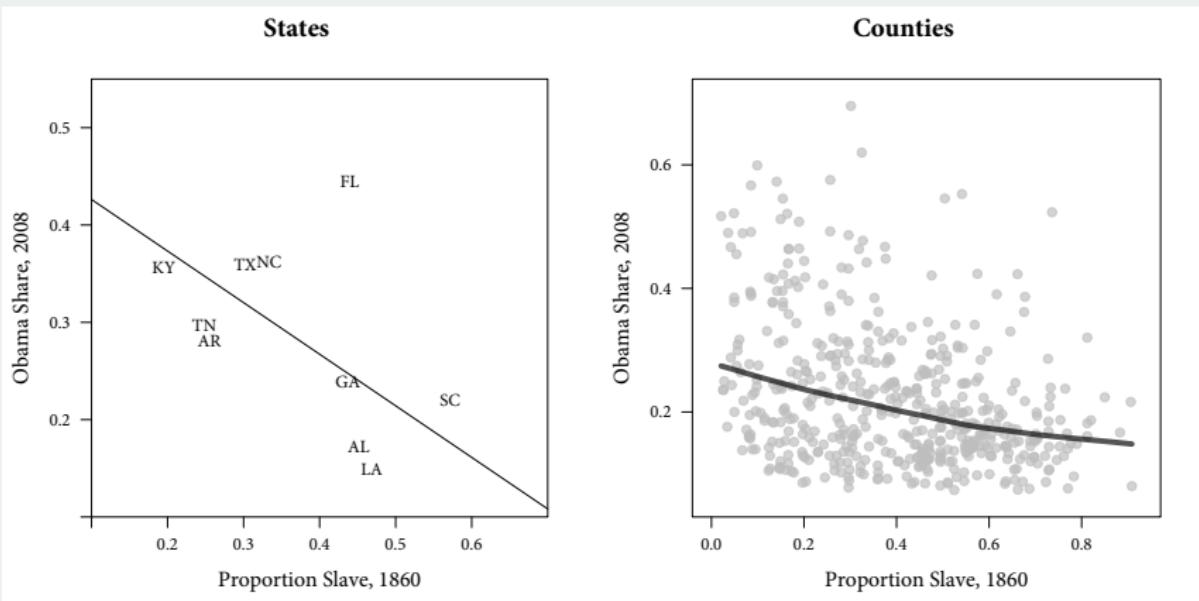
White



%. NOT COUNTED

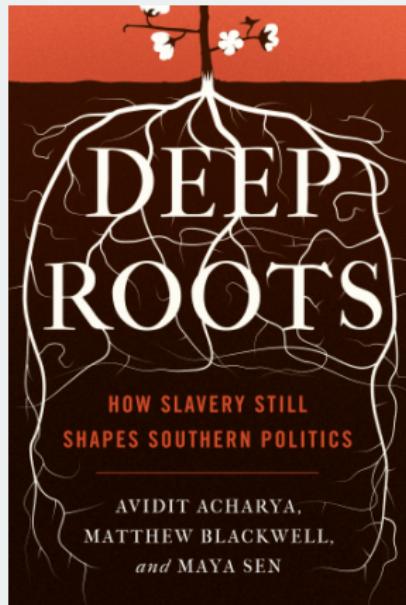
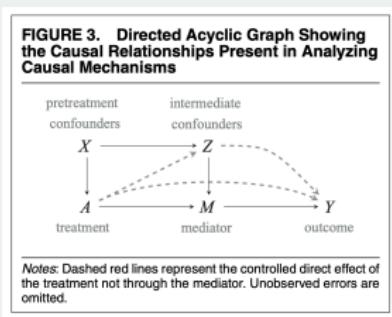
%. DOUBLE COUNTED OR FOUND

Understanding how the past matters



2/ Course Details

About me



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- Understand uncertainty in data analysis and how to quantify it
- Use professional tools like R, RStudio, git, and GitHub

Teaching philosophy

- Deliberate pacing and tons of support.

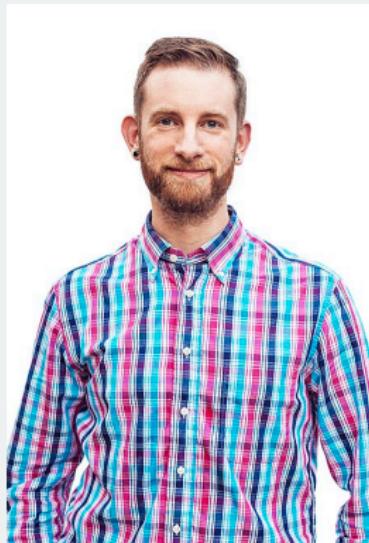
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- Deliberate pacing and tons of support.
- Emphasize intuition and computational approaches over mathematical equations.
- Practice, practice, practice.

Pep talk, part I



Hadley Wickham (chief
data scientist at RStudio)

It's easy when you start out programming to get really frustrated and think, "Oh it's me, I'm really stupid," or, "I'm not made out to program." But, that is absolutely not the case. Everyone gets frustrated. I still get frustrated occasionally when writing R code. It's just a natural part of programming. So, it happens to everyone and gets less and less over time. Don't blame yourself. Just take a break, do something fun, and then come back and try again later.

Pep talk, part II



Hadley Wickham

@hadleywickham

...

The only way to write good code is to write tons of shitty code first. Feeling shame about bad code stops you from getting to good code

10:11 AM · Apr 17, 2015 · Echofon

892 Retweets 55 Quote Tweets 1,144 Likes

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- Material useful to students interested in political science, sociology, economics, public policy, health policy, and many other fields in the social sciences.

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 - Material in section will closely mirror assignments.
- Optional speaker series with industry data scientists, TBA!

Teaching fellows



Angelo Dagonel



Dorothy Manevich



Sooahn Shin



Dominic Valentino

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- Problem Set 0 on the website helps get everything installed.
- Lots of help in section, study halls, office hours.

git and GitHub



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git and GitHub

THIS IS GIT. IT TRACKS COLLABORATIVE WORK ON PROJECTS THROUGH A BEAUTIFUL DISTRIBUTED GRAPH THEORY TREE MODEL.

COOL. HOW DO WE USE IT?

NO IDEA. JUST MEMORIZIZE THESE SHELL COMMANDS AND TYPE THEM TO SYNC UP. IF YOU GET ERRORS, SAVE YOUR WORK ELSEWHERE, DELETE THE PROJECT, AND DOWNLOAD A FRESH COPY.



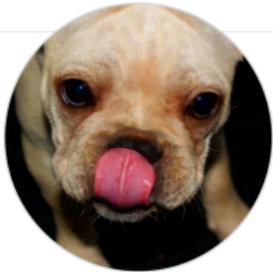
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- Why learn this now?
 - Knowing git/GitHub is a huge plus for data jobs.
 - Your GitHub profile can showcase your amazing new skills with data!

Sample GitHub profile



Mara Averick
batpigandme

[Follow](#)

At 742 followers · 136 following

[@tidyverse](#)
[Missoula, MT](#)
[@dataandme](#)

Achievements



Beta [Send feedback](#)

Overview Repositories 227 Projects Packages Stars 808

batpigandme / README.ind

Hieeeee! I'm Mara. 🐶

```
> # I'm the tidyverse developer advocate
> tidyverse::tidyverse_logo()

```

[Followers 742](#) [Follow @dataandme 47k](#)

Popular repositories

night-owlish Public

An RStudio, tmThemes, and Ace editor adaptation of @sdraa's Night Owl VS Code theme...

1 CSS 125 49

tverse_contributing Public

contributing to the tidyverse from rstudio::conf(2018)

23

GovCodes workshops

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 - Good to attend if Problem Set 0 is giving you trouble.

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- Sometimes same material in two/three different books. Choose which helps most!

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- Final project: a data essay
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 - First item in your public data portfolio

Tutorials

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- Lecture/HW won't be the first time you're trying some code!

Ed discussion board

The screenshot shows the ed platform interface. On the left, there's a sidebar with navigation links like 'New Thread', 'Courses' (with 'GOV 50' selected), 'Drafts' (1), 'Scheduled', 'Categories' (General, Lectures, Sections, Problem Sets, Assignments, Social), and 'GOV J-LAR'. The main area has a search bar at the top. Below it, a 'Welcome' thread from 'General' by Matt Blackwell is listed. A 'New Post' dialog is open, showing tabs for 'Question', 'Post' (selected), and 'Announcement'. It includes fields for 'Title', 'Category' (General, Lectures, Sections, Problem Sets, Assignments, Social), and a rich text editor toolbar. A preview of code input ('mean(some_data)') is shown. At the bottom, there are checkboxes for 'Pinned', 'Private', 'Anonymous', 'Anonymous Comments', and 'Megathread', along with a 'Draft saved' message and a 'Post' button.

ed GOV 50 – Ed Discussion

New Thread

COURSES

GOV 50

Gov J-LAR

Drafts 1

Scheduled

CATEGORIES

- General
- Lectures
- Sections
- Problem Sets
- Assignments
- Social

Search

Cancel

New Post

Schedule Post

Welcome

General Matt Blackwell 2w

Filter

Question Post Announcement

Title

Category General Lectures Sections Problem Sets Assignments Social

Code

I can use **markdown** and insert code easily:

```
mean(some_data)
```

Pinned Keep at top of thread list

Private Visible to you and staff only

Anonymous Hide your name from students

Anonymous Comments Allow anonymous comments

Megathread Resolvable comments

Draft saved

Post

Grades

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- **Bump-up:** we bump up grades of students close to the cutoff who make valuable contributions to the course.

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 - Best to come in groups and work together, grab a tutor when stuck.
- Bottom line: **we want you to succeed in this class!**

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- Respond to sign-up requests for GovCodes and section times.
- **Tell your friends:** data science is more fun with friends along for the journey.