

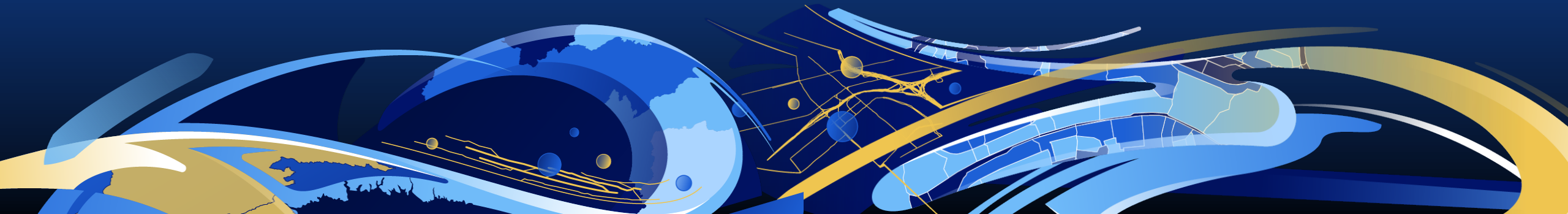
Applied Spatial Data Science: A Complete Workflow

Lauren Bennett

Alberto Nieto

Flora Vale

esriurl.com/spatialstats



Let's get started!

What's our goal?

What's our goal?

Get everyone to vote

How do we want to accomplish this?

How do we want to accomplish this?

Talk to communities who are less likely
to vote

So what's our analysis question?

So what's our analysis question?

Where are the communities that
are less likely to vote?

What data do we need?

What data do we need?

Voter turnout data

What data do we have?



What data do we have?

**Voter turnout data at
the county level**



What do *we really* need?

A map of a city, likely Los Angeles, showing various district boundaries. The map is mostly white with black outlines for the districts. A large, dense area in the center is highlighted with a blue grid pattern, representing a specific geographic area of interest. The text is overlaid on the left side of the map.

What do we *really* need?

Voter turnout data at an
actionable scale

How do we get it?

How do we get it?

Model voter turnout

...so that we can use county level data to predict tract level data (downscale)

Then what?

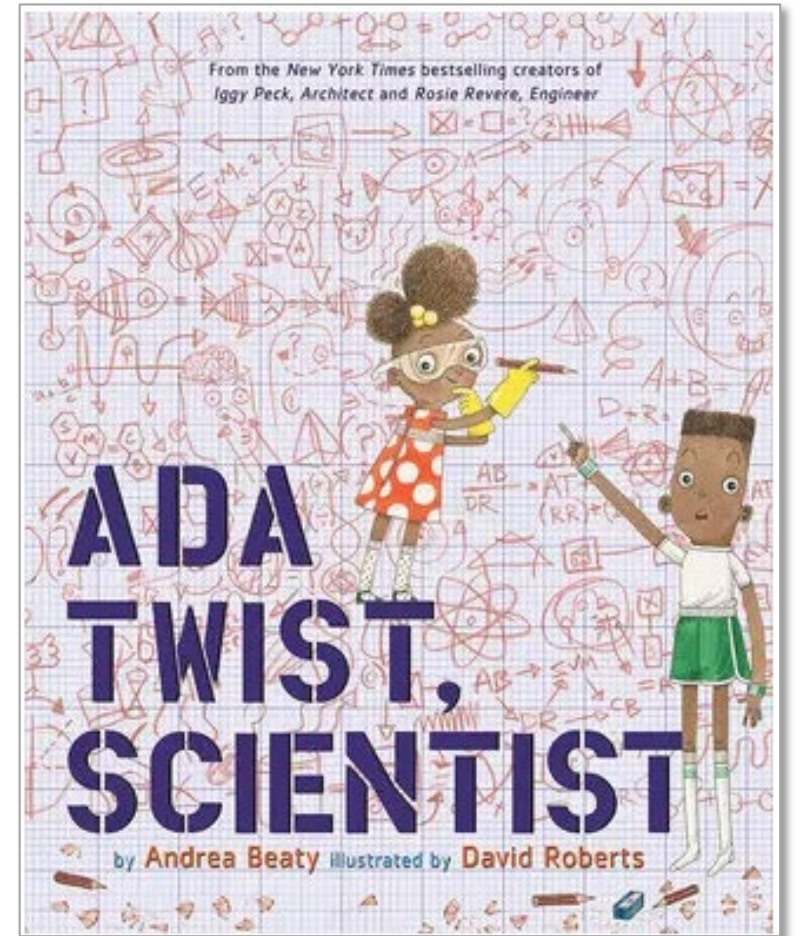
Then what?

Canvas in communities where
we expect low voter turnout

“Ada Marie did what scientists do:
She asked a small question, and
then she asked two.

And each of those led her to three
questions more,
and some of *those* questions
resulted in four.”

Andrea Beaty



Today's analysis workflow

- Define goal ✓
- Gather and prepare data
- Visualize and explore data
- Model voter turnout*
- Use model predictions to plan canvassing route

Gathering and preparing data



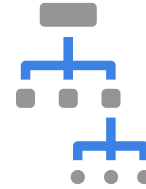
Exploring and visualizing available data



Modeling voter turnout



Modeling workflow



Step 0. **Prepare** your data

Step 1. **Train** a model

Step 2. **Evaluate** model performance

Step 3. **Train again** with different parameters

Step 4. **Compare** models

Step 5. **Repeat...** ∞

Step 6. Use best model to **predict unknown values**

Modeling voter turnout



What's our goal?

How do we want to accomplish this?

So what's our analysis question?

Canvas planning



THANK YOU!

esriurl.com/spatialstats

esriurl.com/spatialdatasciencemooc

HOME PRESENTATIONS HANDS-ON TOOL OVERVIEW ADDITIONAL RESOURCES R-AROGIS BRIDGE ADD-IN

Spatial Statistics Resources

The latest from the Spatial Statistics team

Presentations

Find our presentations from UC and more

Machine Learning in ArcGIS
Traditional and spatial Machine Learning (ML) algorithms in ArcGIS. These data-driven algorithms and techniques are used for prediction, classification, and clustering of data. Examples include image classification, spatial pattern analysis, and prediction and more.

Data Visualization for Spatial Analysis
Data visualization techniques within ArcGIS can help you explore your data, interpret the results of analysis, and communicate your findings. Using maps, charts and 3D scenes can help you compare categories and amounts, visualize distributions and frequency, explore relationships and correlations, and understand change over time or distance. | [2019 UC Slides](#)

Essentials of Cluster Analysis: Pattern Mining in Space and Time
Measuring and quantifying the patterns that we see is crucial for informed decision making. This workshop will explore the powerful spatial statistics techniques designed to quantify spatial and spatiotemporal patterns. Concepts covered include aggregating data spatially and temporally; identifying clusters and outliers in both space and in time; and best practices for interpreting and sharing your results. | [Slides](#) | [2019 UC Slides](#)

Local R-Square Coefficients

MOOC

Spatial Data Science: The New Frontier in Analytics

Register



Duration: 6 Weeks (2-3 hours of study per week)

Cost: Free

About this MOOC

OCT 28 - DEC 9, 2020

Use location to find patterns and tackle complex problems.

Spatial data science allows analysts to extract deeper insight from data using a comprehensive set of analytical methods and spatial algorithms, including machine learning and deep learning techniques. This course explores the application of spatial data science to uncover hidden patterns and improve predictive modeling. You'll work with powerful analytical tools in Esri's ArcGIS software and learn how to integrate popular open data science packages into your analyses.



esri®

THE
SCIENCE
OF
WHERE®