From Raw Data to Models

Albert Wendsjö

University of Gothenburg

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- Not so obvious if you want complicated annotations

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  - You know what a regression is

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  - Is this text about sports?
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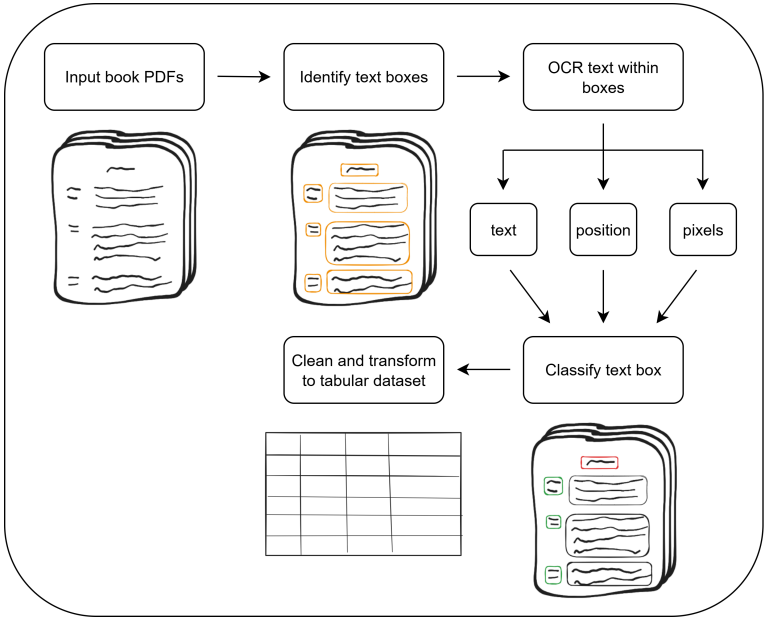
- In both cases the model learns the pattern between words/pixels (X) and sports/football (Y)?
- The model will learn the best pattern given the data

Why?

- This allows us to transform unstructured data into structured (tabular) data at scale
- Why is this good?
- We get more statistical power, more subgroup analysis, can fit complicated statistical models...



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- Recent trends suggest we need less data for training ($n \leq 500$), but we still need data for validation
- Model accuracy is a population parameter; we need sufficient sample size to estimate it!
- Measurement error reduces statistical power, requiring annotated data to adjust for it

Running Example

- How can we classify texts? Words?
- How can we classify images? Parts of images?

Running Example

- The Snap Political Ads library contain 72146 political ads (2018-2025) from 54 countries
- We will limit us to the United States and images ($n = 9207$)
- (I provide full script for downloading, structuring and OCR:ing the ads.)

The tasks

- Texts
  - Classify topic (about voting or not)
  - Extract candidates and detect stance toward them
- Images
  - Extract faces
  - Classify faces
    - Gender (male, female)
    - Age (young, middle-age, old)
    - Ethnicity (white, non-white)

What can we do with this?

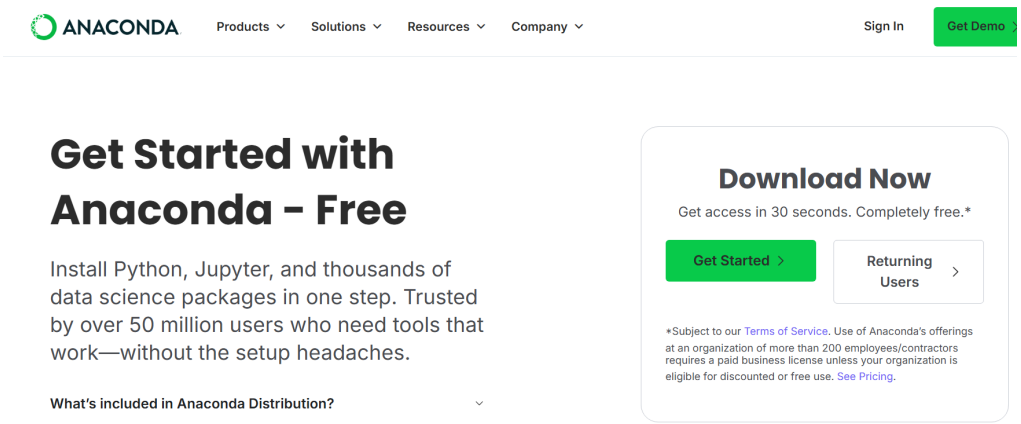
- How much money is allocated to positive and negative campaigns?
- When do political ads target specific demographics? (Visual group appeals)
- What type of ads generates the most interactions?
- For which groups do they encourage voting registrations?

How we will do it

- For annotation we will use Label Studio. It is an open source software that can be applied to many types of annotation tasks
- For training models, we will use Google Colab. I have prepared a notebook with scripts that show how you can import and apply annotated data to train and use various models

How to install Label-Studio

Step 1. Download Anaconda (a Python distributor)



How to install Label-Studio

Step 2. Install Label-Studio the Anaconda prompt (terminal)
Step 3. Start Label-Studio in the Anaconda prompt (terminal)