

UVA DS2003 Communicating with Data

Fall 2026

Storytelling with Data

Narrative Visualization

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based on materials by Hannah Bako and a lot of other people

Project 2: Interactive Notebook & Infographic/Science Visualization

- *Explanatory analysis*: together, your notebook and final deliverable will tell a story about a dataset
- This will require you to:
 - First *explore* the data (a short EDA)
 - Determine what *story* you are interested in telling
 - Put together *interactive* visualizations into a notebook *report*
 - Pick a single message you will emphasize in a single *graphic* (infographic or scivis)
- *Present* the notebook and graphic to the class
- Unlike the first project, where you asked questions of the dataset and reported what you found, you will need to identify a key message to persuade the audience based on your analysis of the data
 - This is not a modeling class, so no sophisticated modeling is necessary. However, your analysis should lead to a primary argument you want to make that is sufficiently supported by the data

Project 2: deadlines

- This **Wednesday**: Pick your groups (3 people per group) by 10am on Wednesday; at 10, I will finish sorting the groups if you don't have a preference for who you work with
- Oct 25: Project Proposal
- Nov 15: Narrative Structure Outline
- Nov 22: Design critique reflection
- Dec 1: Final presentation: interactive walkthrough and graphic presentation
- Dec 7: Final interactive notebook
- Dec 7: Final infographic/science visualization and design rationale

Explanatory visualizations: outline of the second half of the semester

- Storytelling
- Interactive design: plotly and ipywidgets
- Non-tabular data: networks and trees
- Infographics
- Science visualizations
- Data journalism
- Data quality, ethics and rhetoric

What you will learn today

The role of storytelling in data communication

How to identify the components of a data story

How to avoid the same mistakes others have made in telling story with data

Exploratory vs. explanatory visualization

- **Exploratory** visualization is for *you*: many quick, rough charts to understand the data and find what is interesting
- **Explanatory** visualization is for *your audience*: a designed chart that communicates one specific message to specific people
- Exploratory is **finding** the story; explanatory is **telling** it
- Project 1 was exploratory. Project 2 is explanatory.

Narrative Story-Telling

narrative (n): An account of a series of events, facts, etc., given in order and with the establishing of connections between them.

Effective story-telling “require[s] skills like those familiar to movie directors, beyond a technical expert’s knowledge of computer engineering and science.” - Gershon & Page ‘01

Think | Pair | Share

- What's your favorite movie or book?
- Why is it your favorite?
- How does it go beyond a simple chronological “what happened” to tell a story that moved you?

Movies and books are “author-driven”... there is a strong narrative with little choice for the reader

Interacting with raw information is “reader-driven”... open interaction with no predefined story

The sweet spot: narrative visualization balances your intended narrative path (as the designer) with interactive reader exploration.

But *how* do we tell a good story
with data?

Storytelling

Good stories do more than provide facts and data

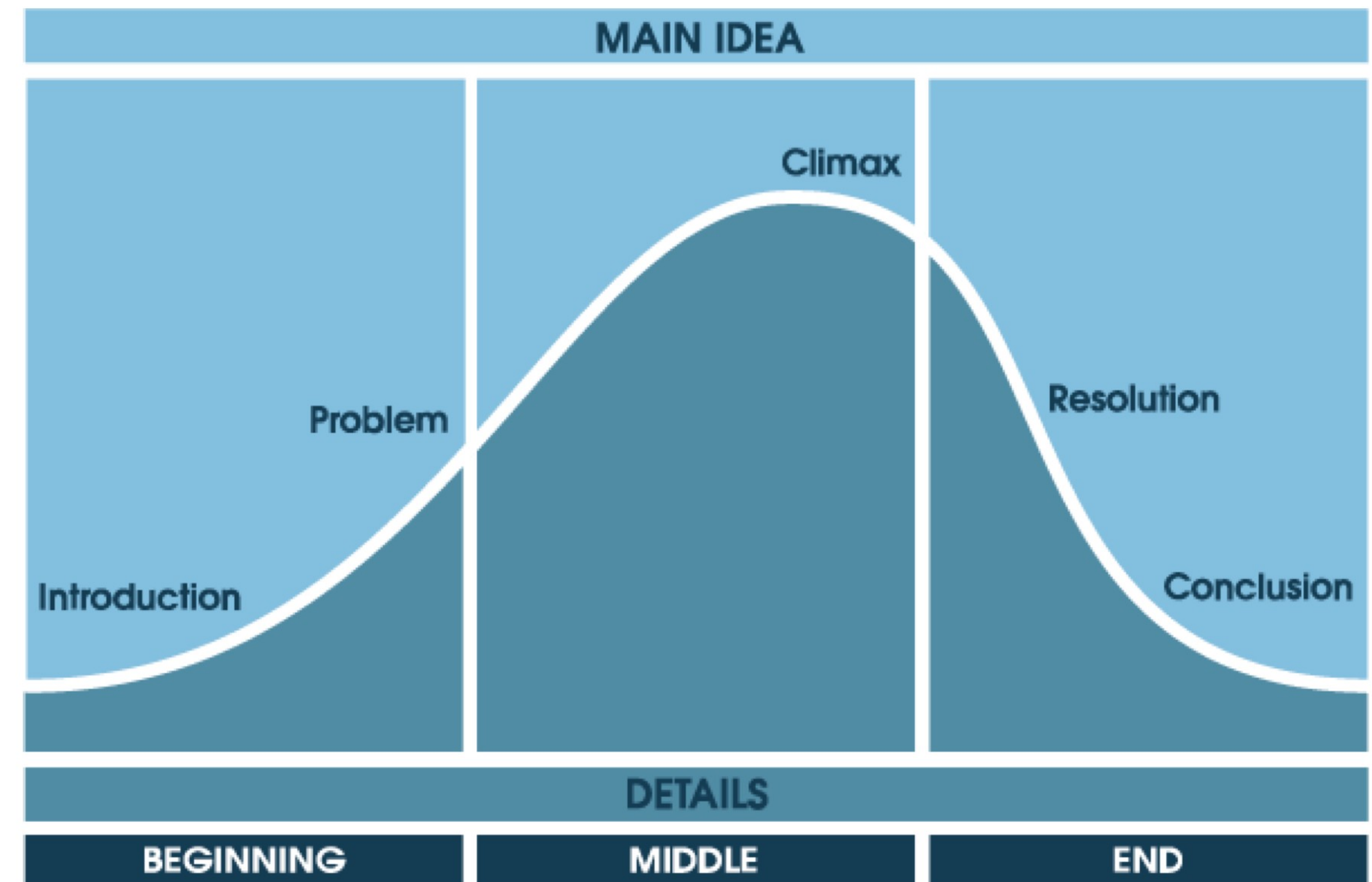
they situate and give context

they engage

they educate

Who / What / Where / When

Why / How



Storytelling with data: simple, powerful messaging

Underscore your arguments with Data/Facts

Leverage the power of Visualization

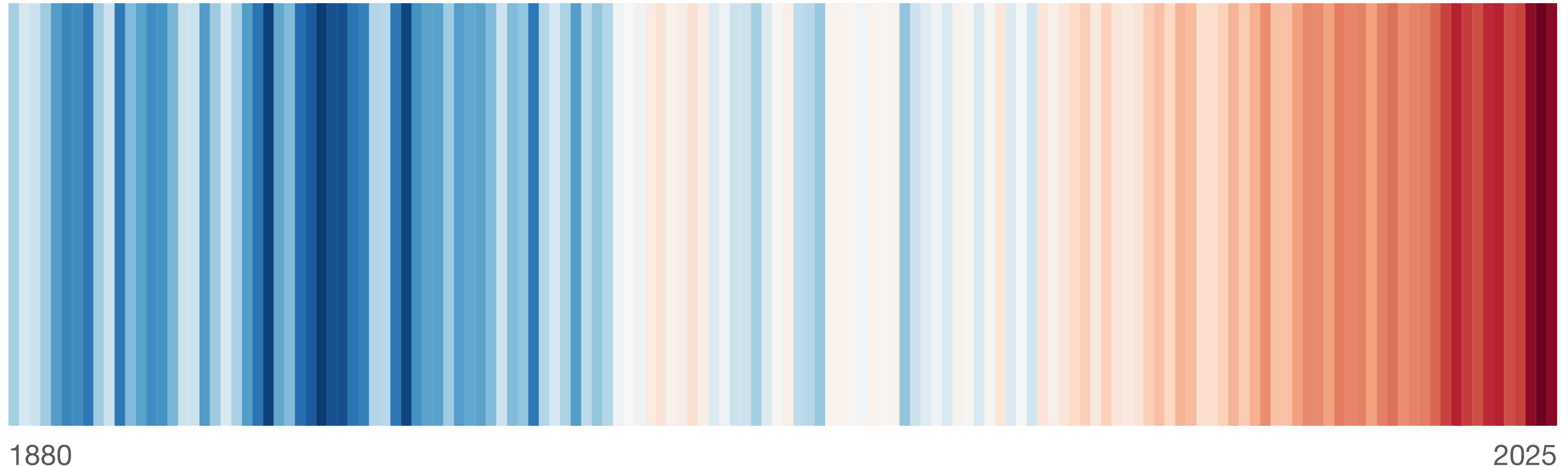
- Show Trends

- Show Correlations

- Show Outliers

- Convey Magnitudes

Storytelling with data: simple, powerful messaging



Trend

Blue gives way to red: no axis needed to see the direction

Outliers

The 2023–24 stripes are darker than anything before them

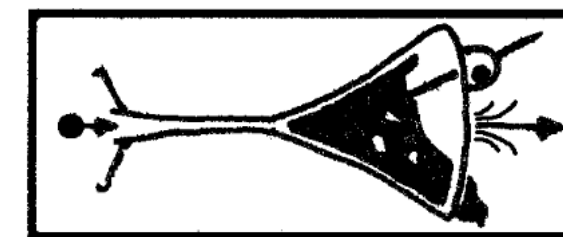
Magnitude

Darker means farther from normal: 2024 ran 1.3 °C above the 1951–80 average

Like a film director, you must direct the viewer's attention to your story... while making sure you tell the truth about the data.

- You must first do **EDA** to see what the data supports
- Just like your first project, you will find a few interesting conclusions from the data; things that you might want to communicate to others!
- These ideas become the **core of the story** you want to tell
- Lead the viewer where you want them to go, giving a little freedom to explore

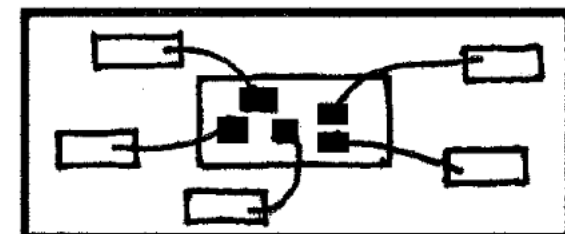
- **Martini glass model** for narrative structure



- **Interactive progression** through charts

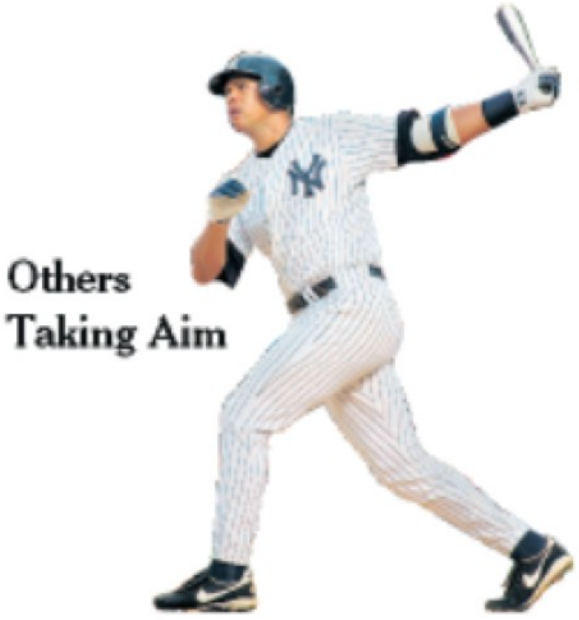
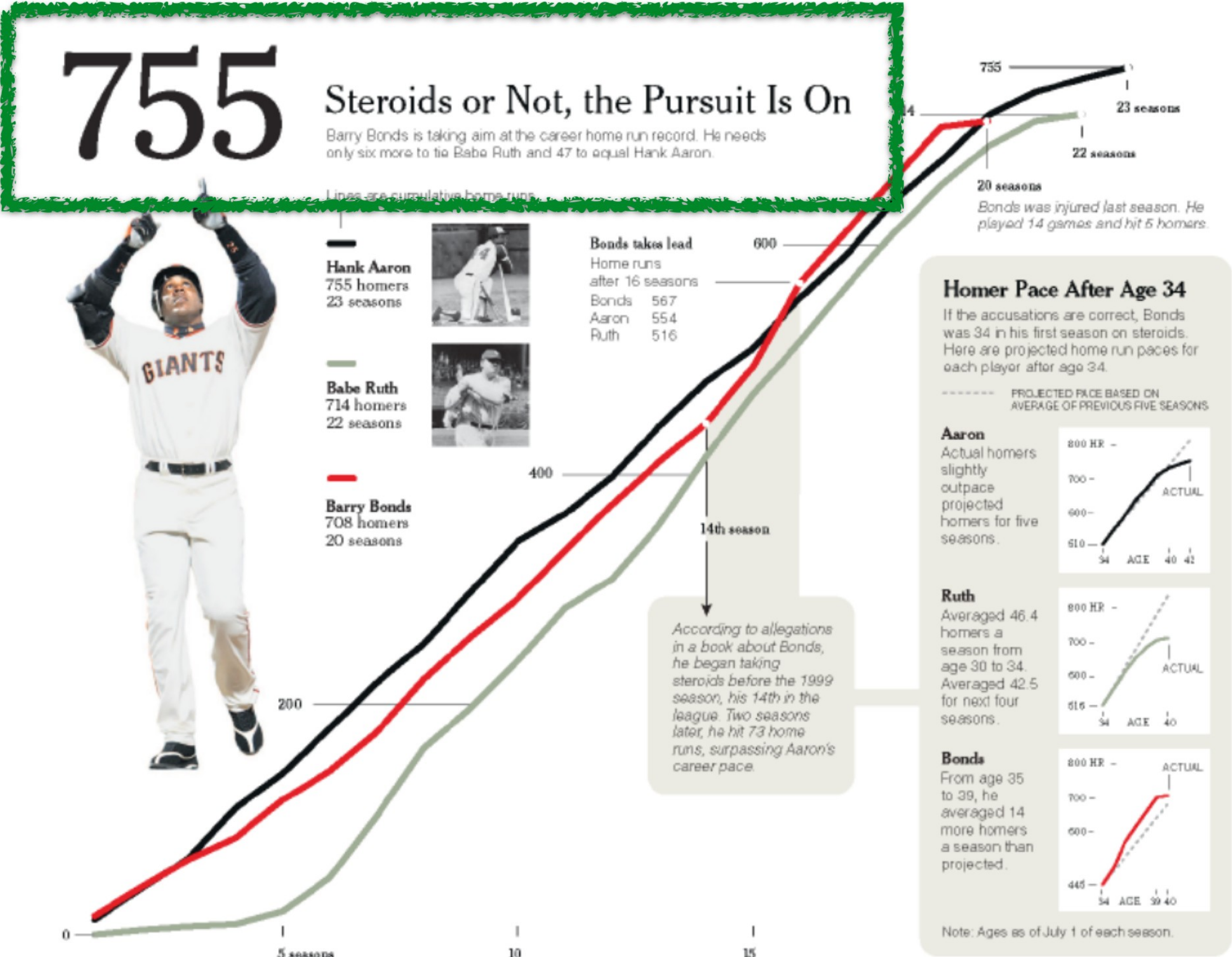


- **Drill-down** story

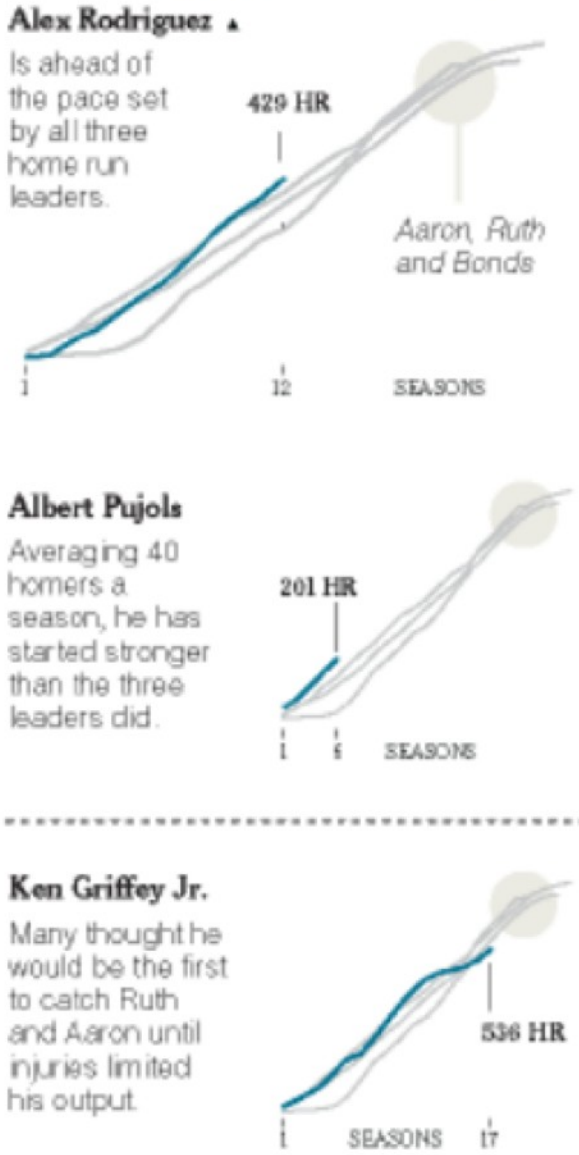


Components of a good data story

Introduction

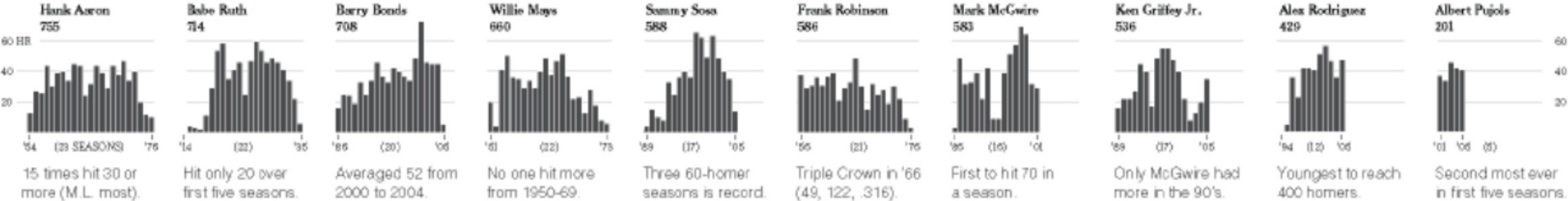


Others Taking Aim

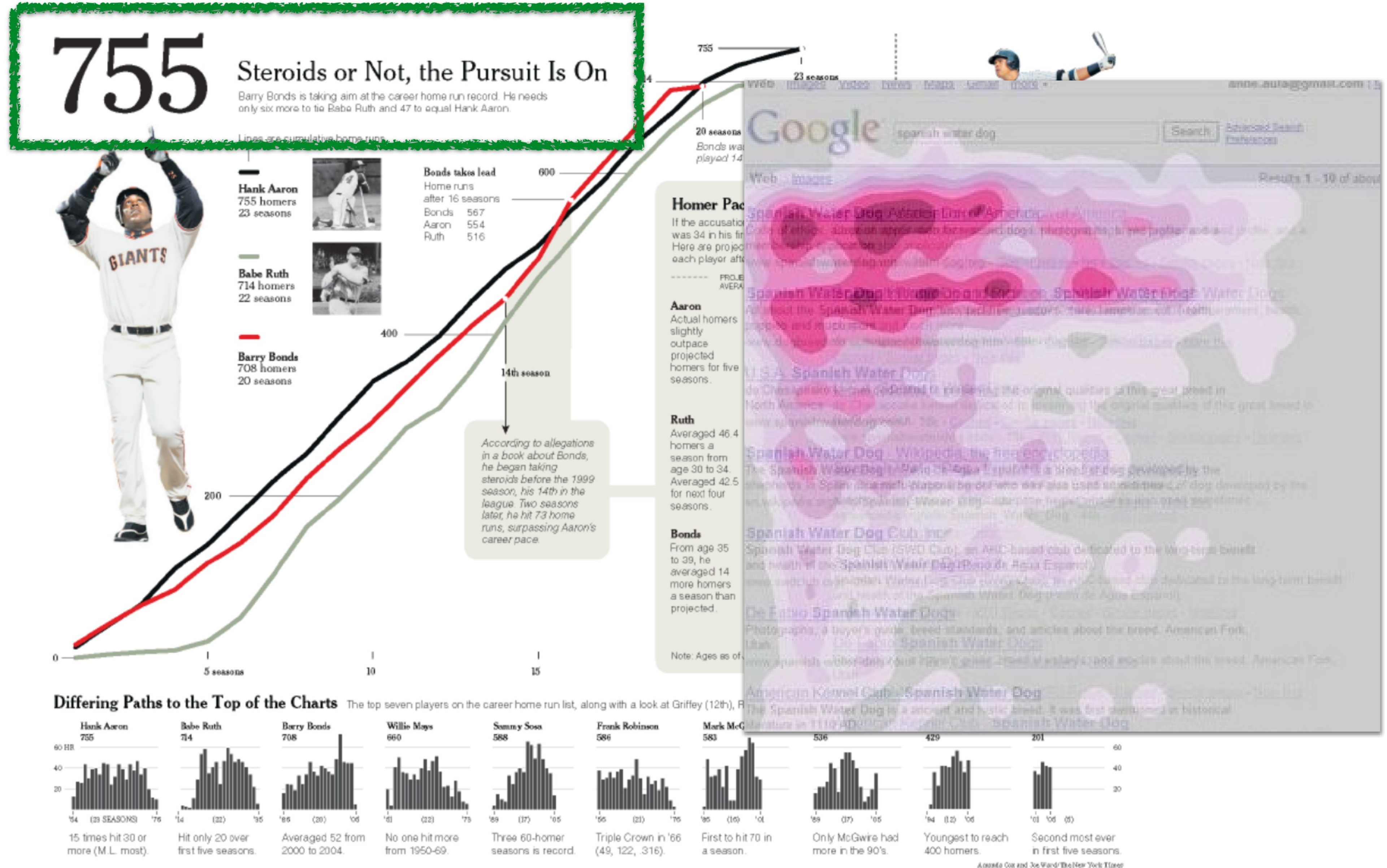


Differing Paths to the Top of the Charts

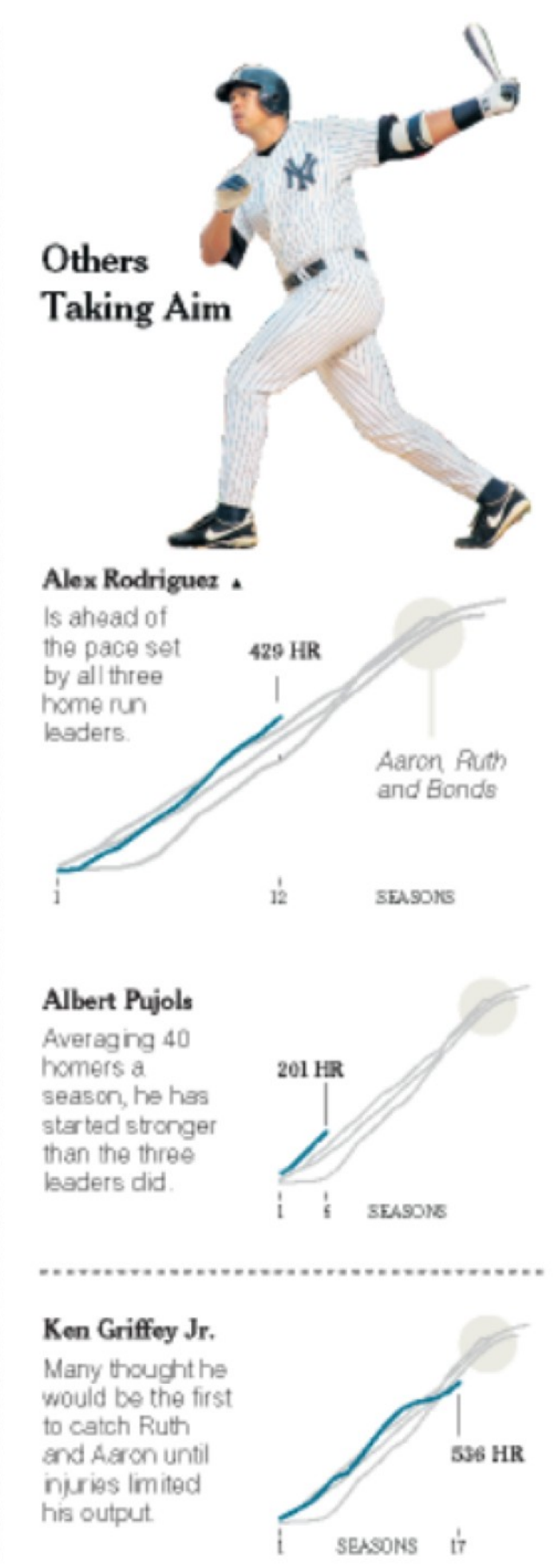
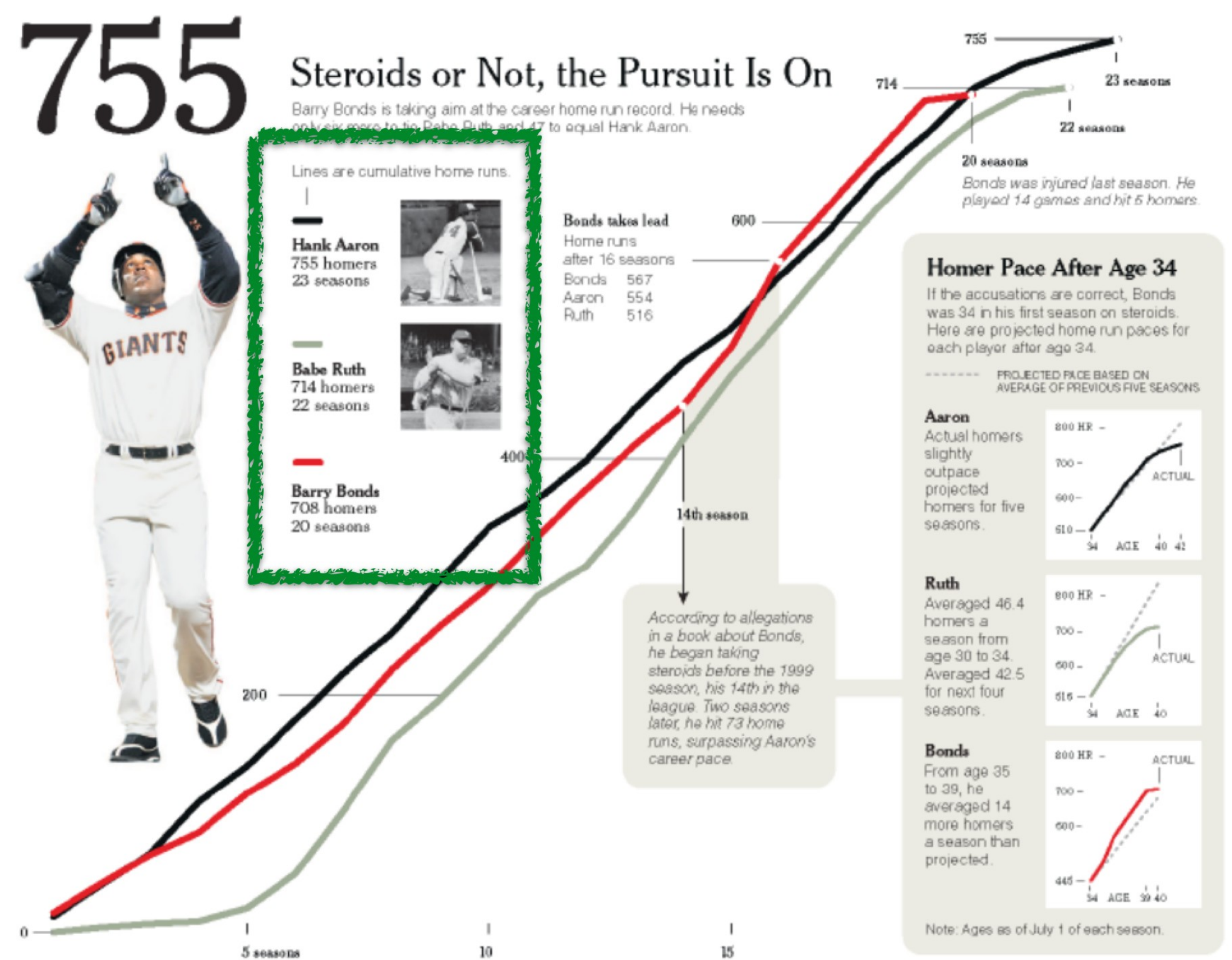
The top seven players on the career home run list, along with a look at Griffey (12th), Rodriguez (37th) and Pujols (tied 257th).



Introduction

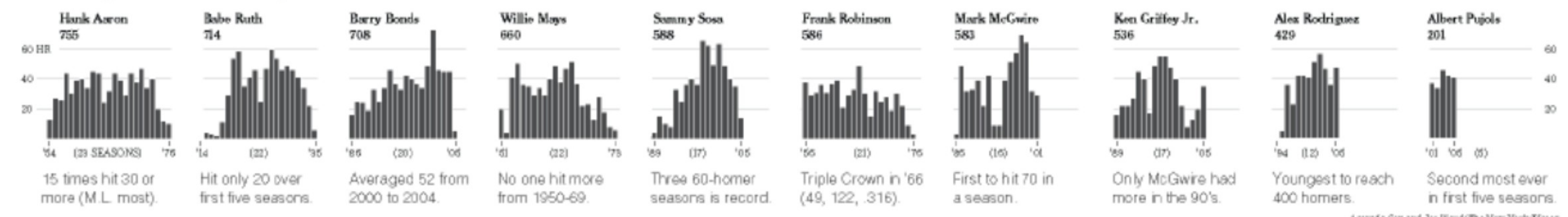


Context / Legend

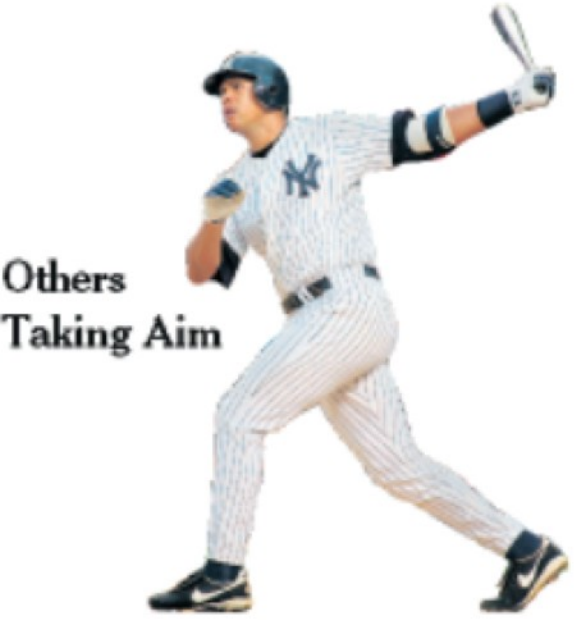
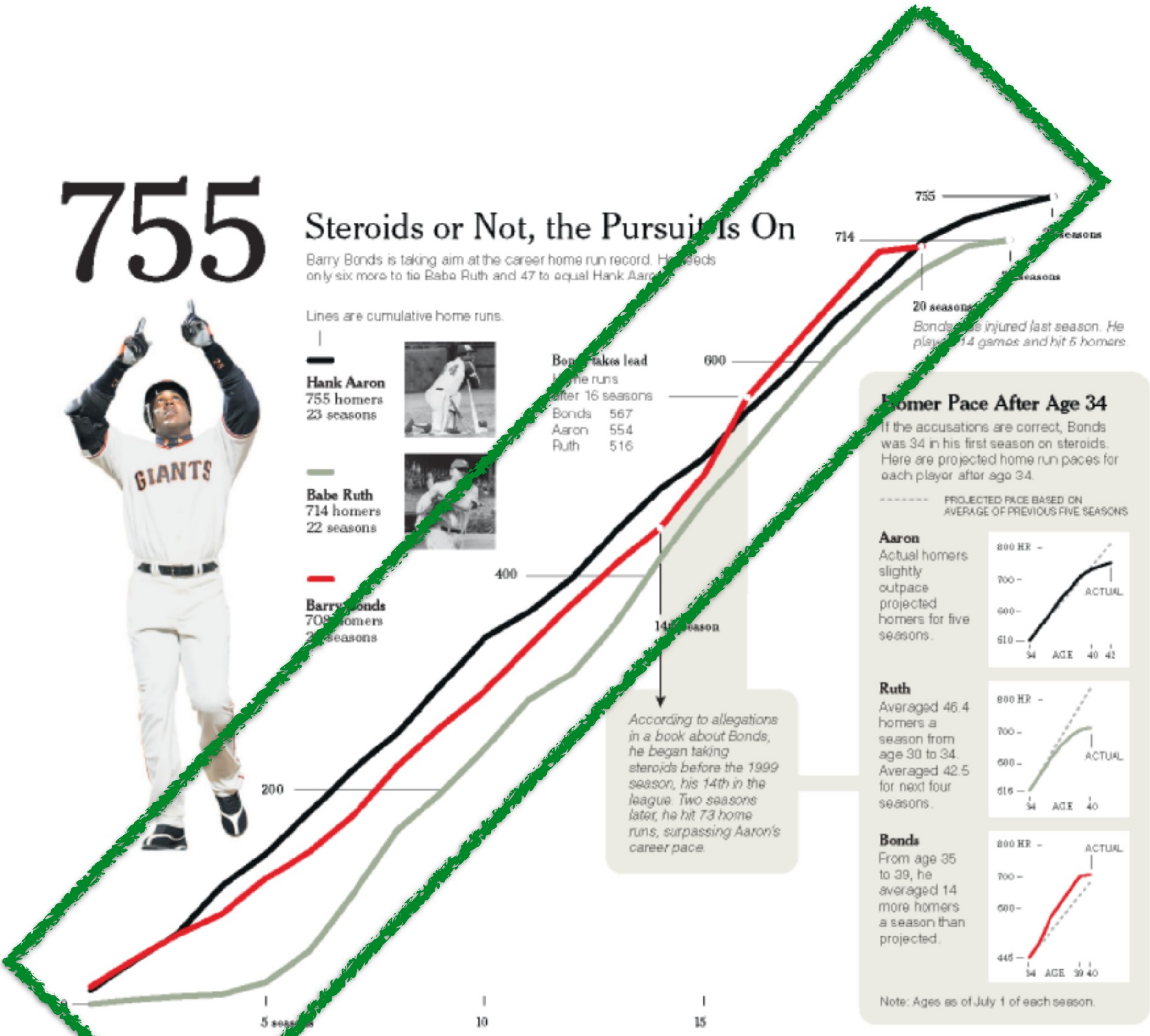


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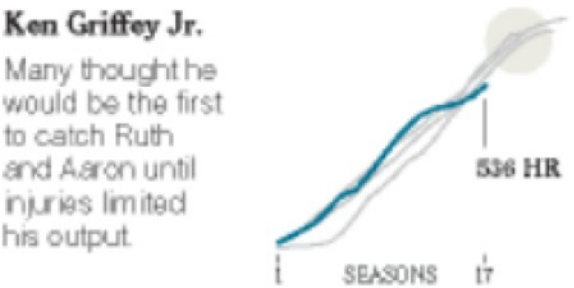
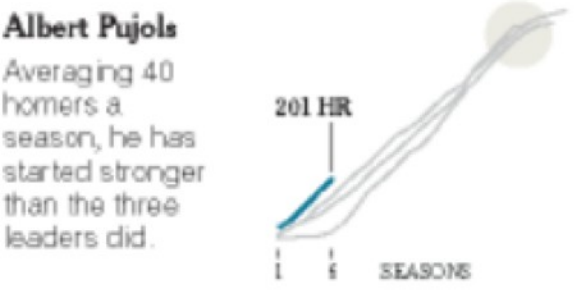
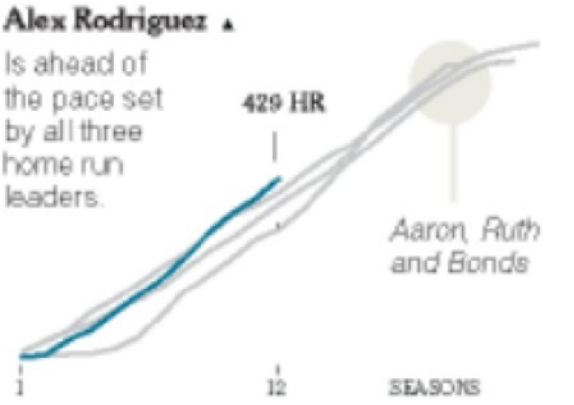
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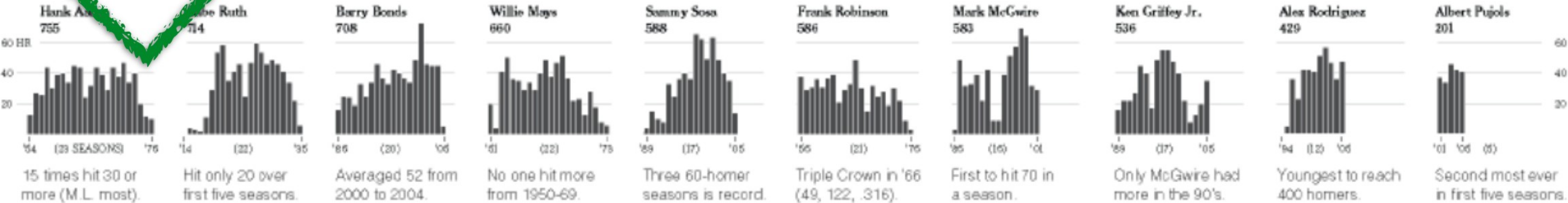
Main Story



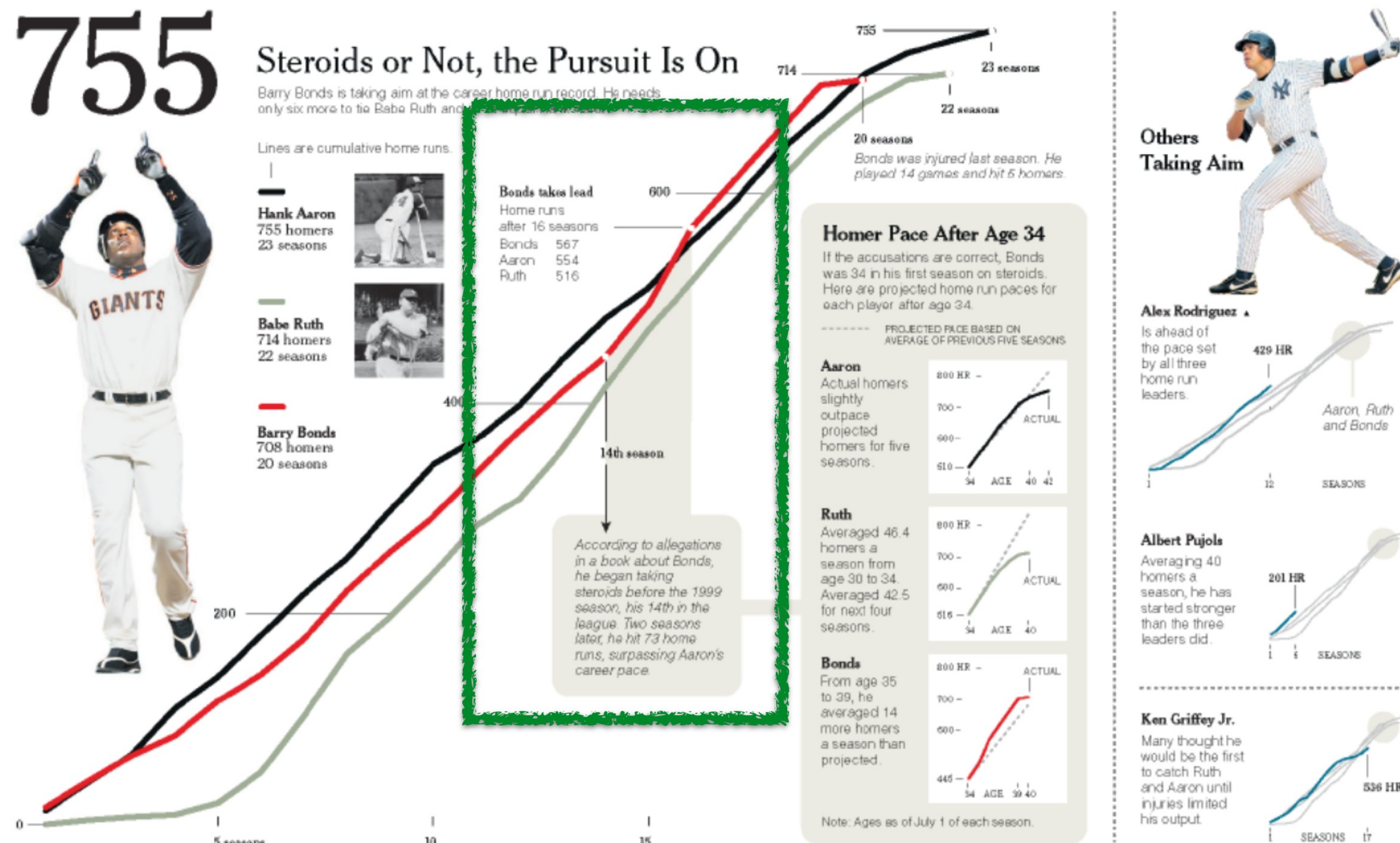
Others Taking Aim



Differing Paths to the Top of the Charts

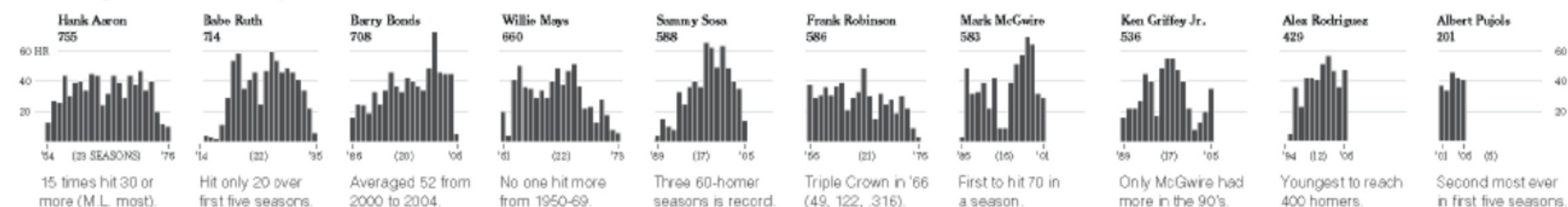


Annotation of key point: a change in trends

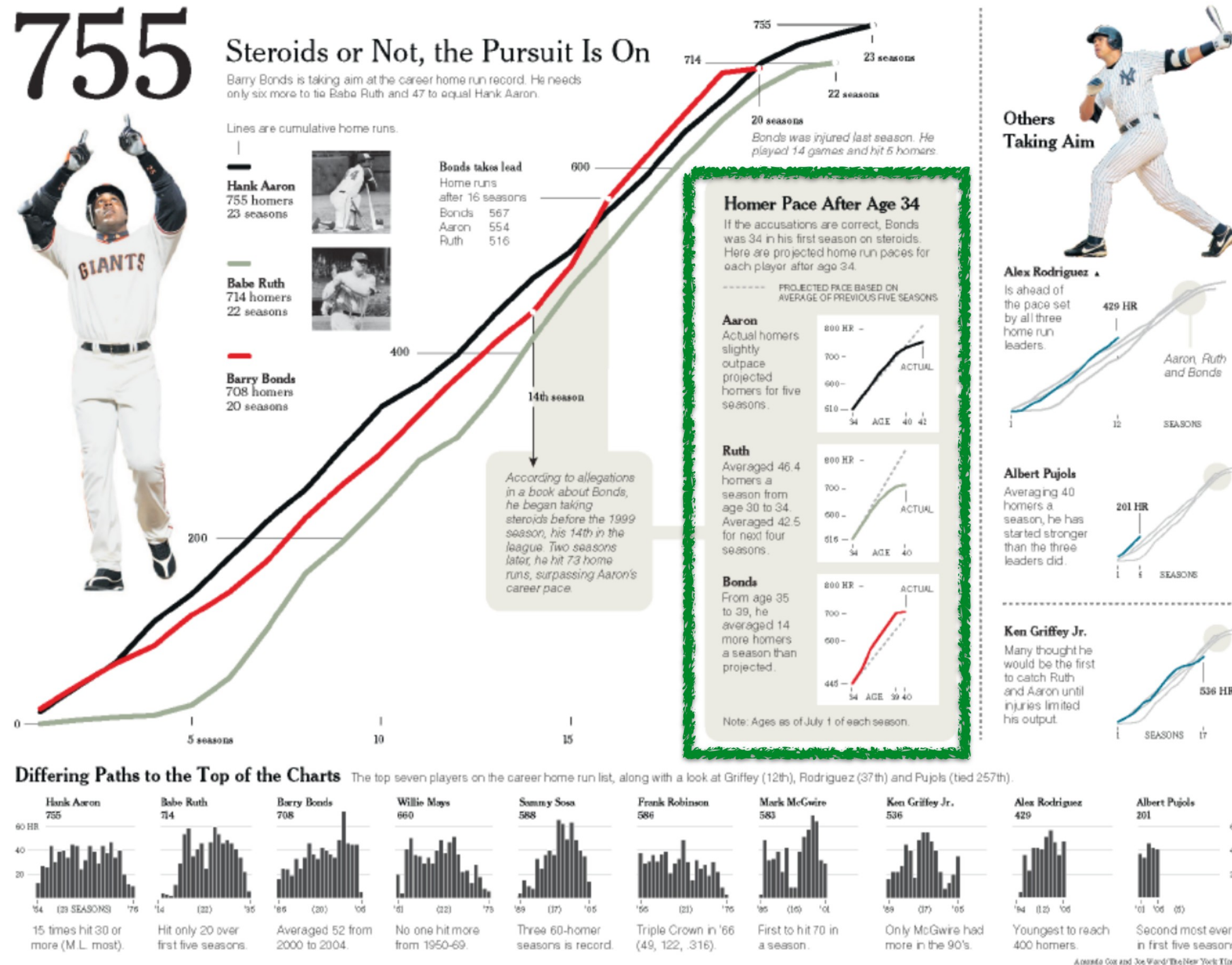


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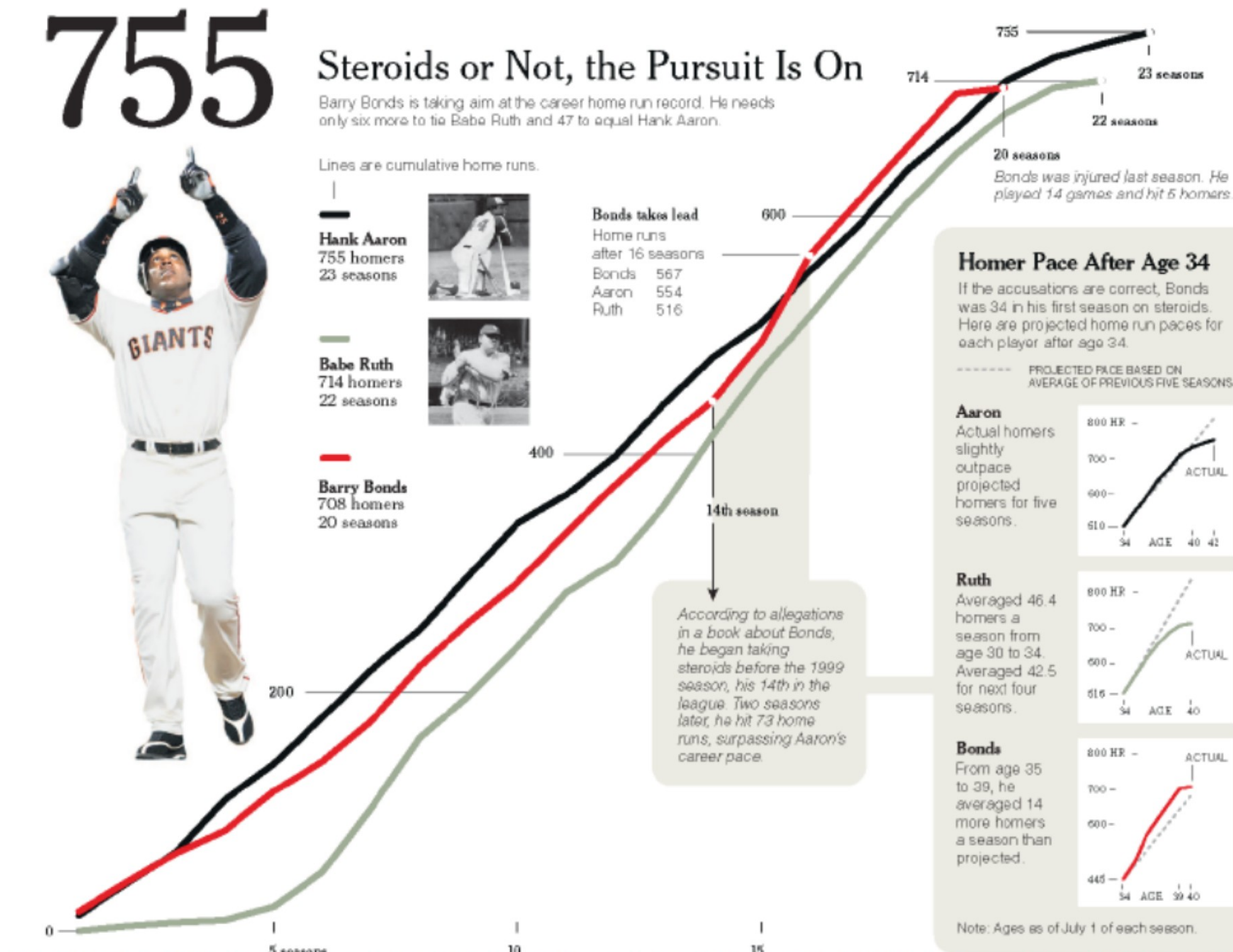


Context, using **matching** on content (color, trend)

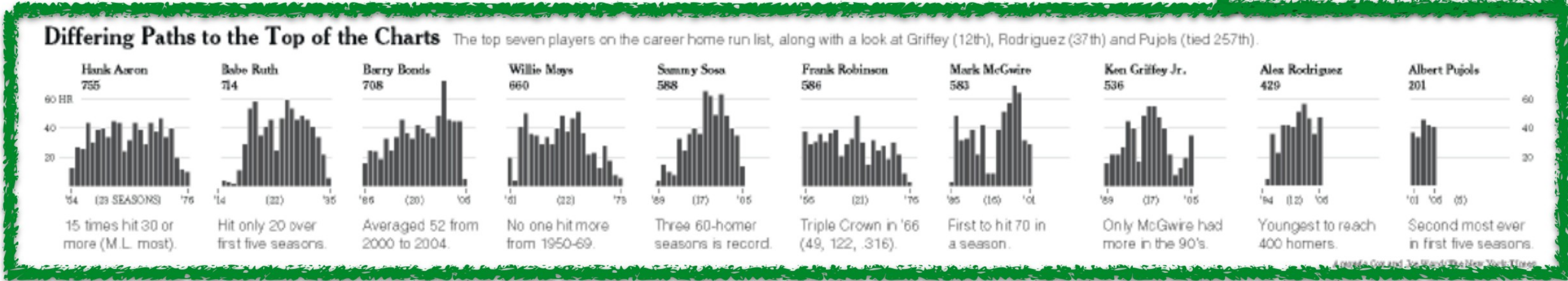


Multi-Messaging - in-depth information

Other Players



Different Paths



Where failed data stories go wrong

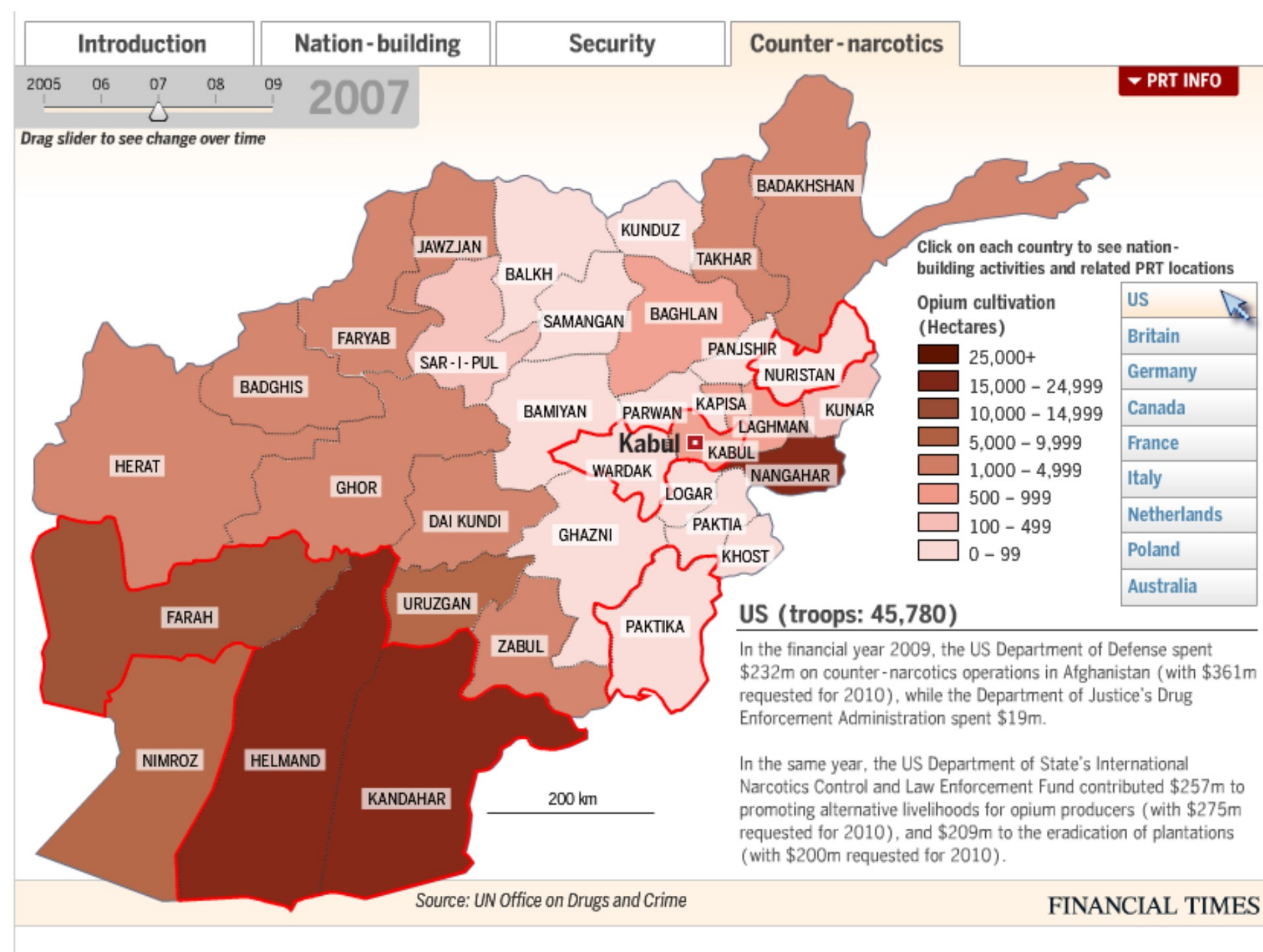
Think | Pair | Share

- Think of a time someone tried to tell your or others a story with data, and it failed.
- What do you think went wrong?
- Why was the intended message not communicated effectively?

Afghanistan: behind the front line

Intended purpose of the graphic: to establish indicators of success by which to evaluate the development work being done in Afghanistan

- Semantically consistent color
- Details on demand
- However, it does not guide the viewer through the data at all → too much flexibility → viewer can't reach meaningful conclusions intended by the designers



The graphic “suffers by putting exploratory power into the hands of the viewer without sufficient guidance”

Minnesotan Employment Explorer

Context: in July 2008, Minnesota was in recession, so Minnesota Public Radio (MPR) released “**Minnesota Slowdown:**” stories detailing the state’s economic malaise and shares interviews with residents hit hard by the downturn.

Intended purpose: engage readers in finding and telling their own stories in the data.

Only 23 people engaged, and not Minnesotans

- No tutorial and too much data → confused users
- No rich, emergent story
- Disconnected from the narrative (graphic showed 2000-2007)

Minnesota Quarterly Employment (by Industry) 2000-2007

All Minnesota Industries

93,702 (+3.7%) jobs added between 2000-2007



Share Your Insights (13/62 Comments)

These seem to be three of the areas hardest hit by the slowdown.

by Andrew H. on Jul 16

Health care has accounted for more than half of the jobs added since 2000.

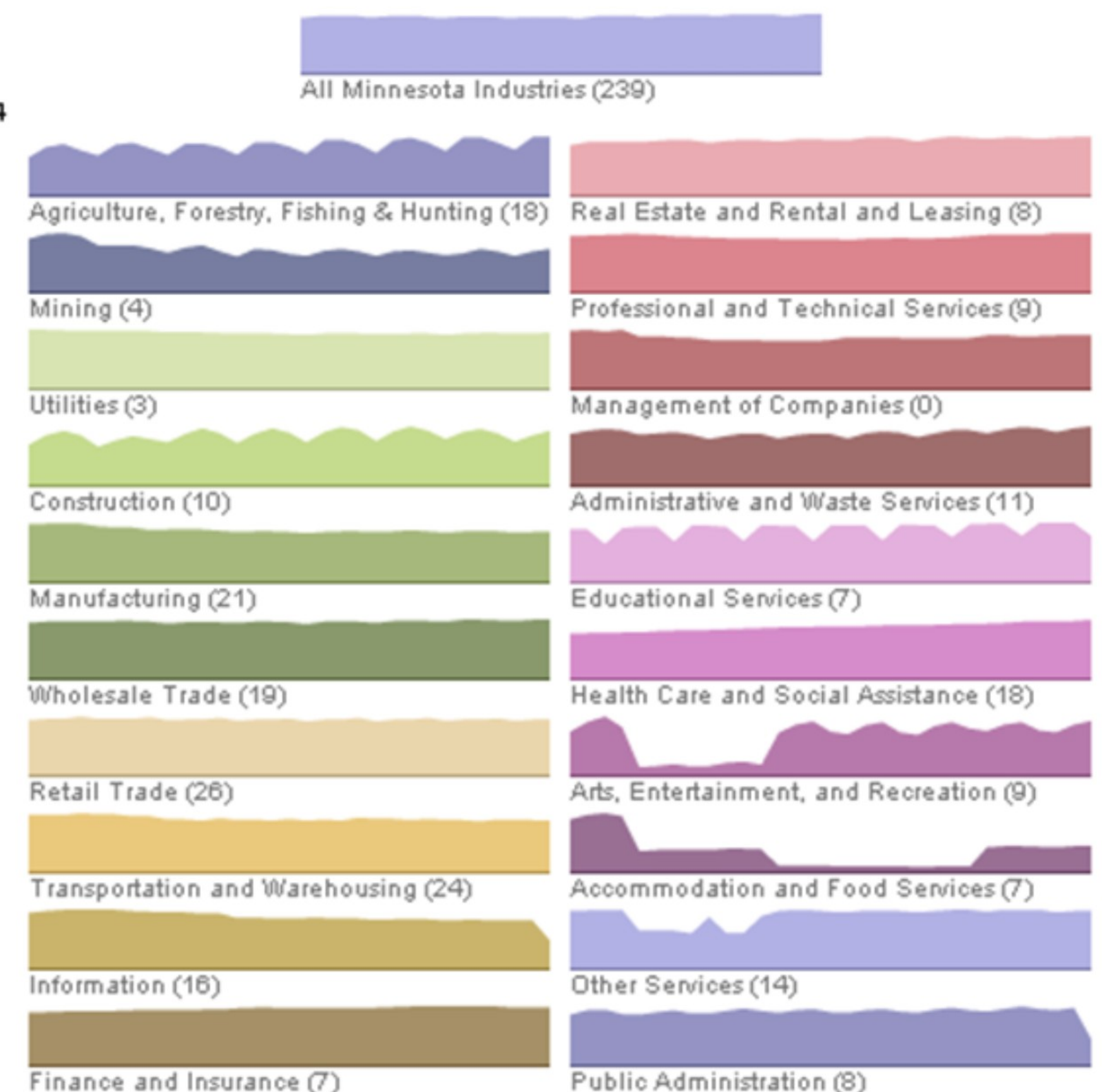
by Bryan C. on Jul 18 - 1 reply

What happened to 'Information' jobs?!? 25K+ lost in one quarter? That doesn't seem possible. Or did somebody move out of state that I've overlooked?

by brian s. on Jul 18 - 1 reply

Minn Dept of Econ Dev attributed 2000-2001 unemployment to the [dot.com](http://www.deed.state.mn.us/lmi/publications/trends/0701layoff.htm) bust (<http://www.deed.state.mn.us/lmi/publications/trends/0701layoff.htm>). It's interesting that the initial drop in Arts employment preceded the start in Managerial employment by 1 qtr. And Arts also bottomed out 3 qtrs before Management. Is Arts, Entertainment, and Recreation employment an indicator of future trends in White-Collar employment?

by Brad S. on Jul 19



Summary

- Explanatory visualization is about communicating a story that you found in the data
 - It is not about manipulating the data to tell a story that you already think is true!
 - Effective storytelling should guide the viewer to the core message and allow for a restrained amount of exploration
 - In Western cultures, we read left to right and top to bottom, so most important information should be top left
- Use clear annotations and legends to highlight the main story
- Too much data/chronological “as you made them” charts will not be effective