The Wicked Design Problem of Teaching Wicked Design

Eytan Adar

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THE CHALLENGES OF TEACHING DATA VISUALISATION

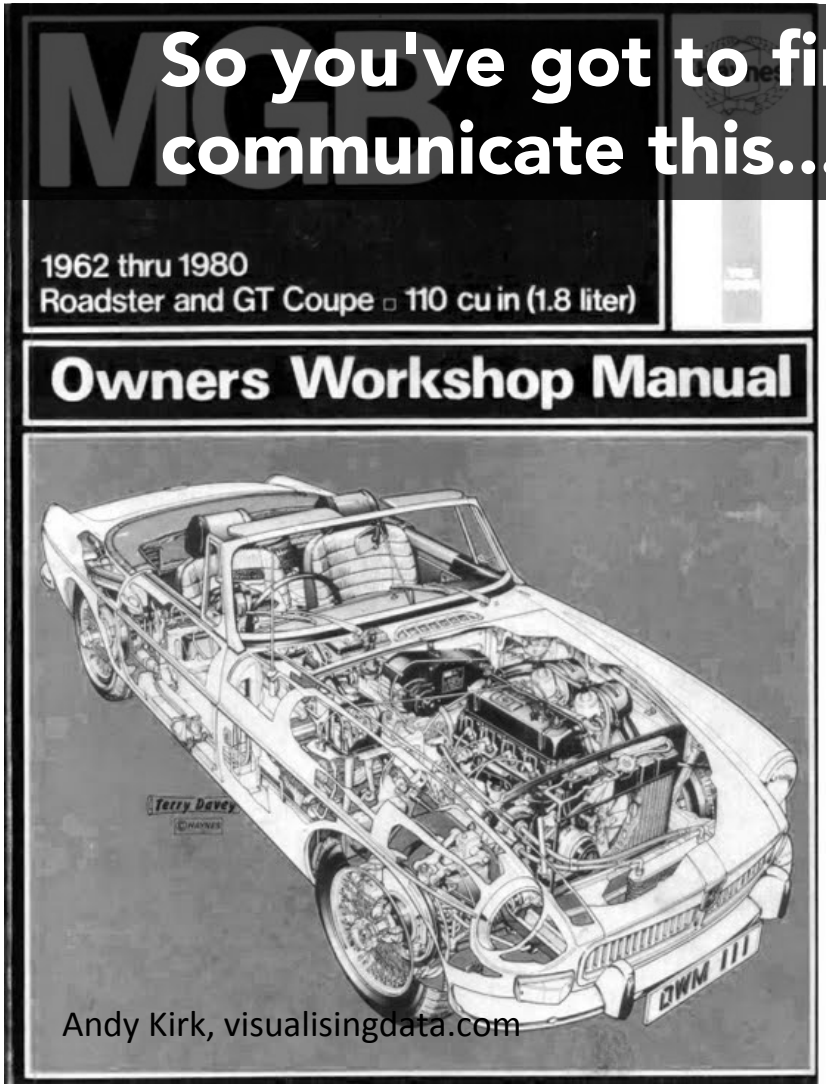
(borrowed, with apologies from)

Andy Kirk

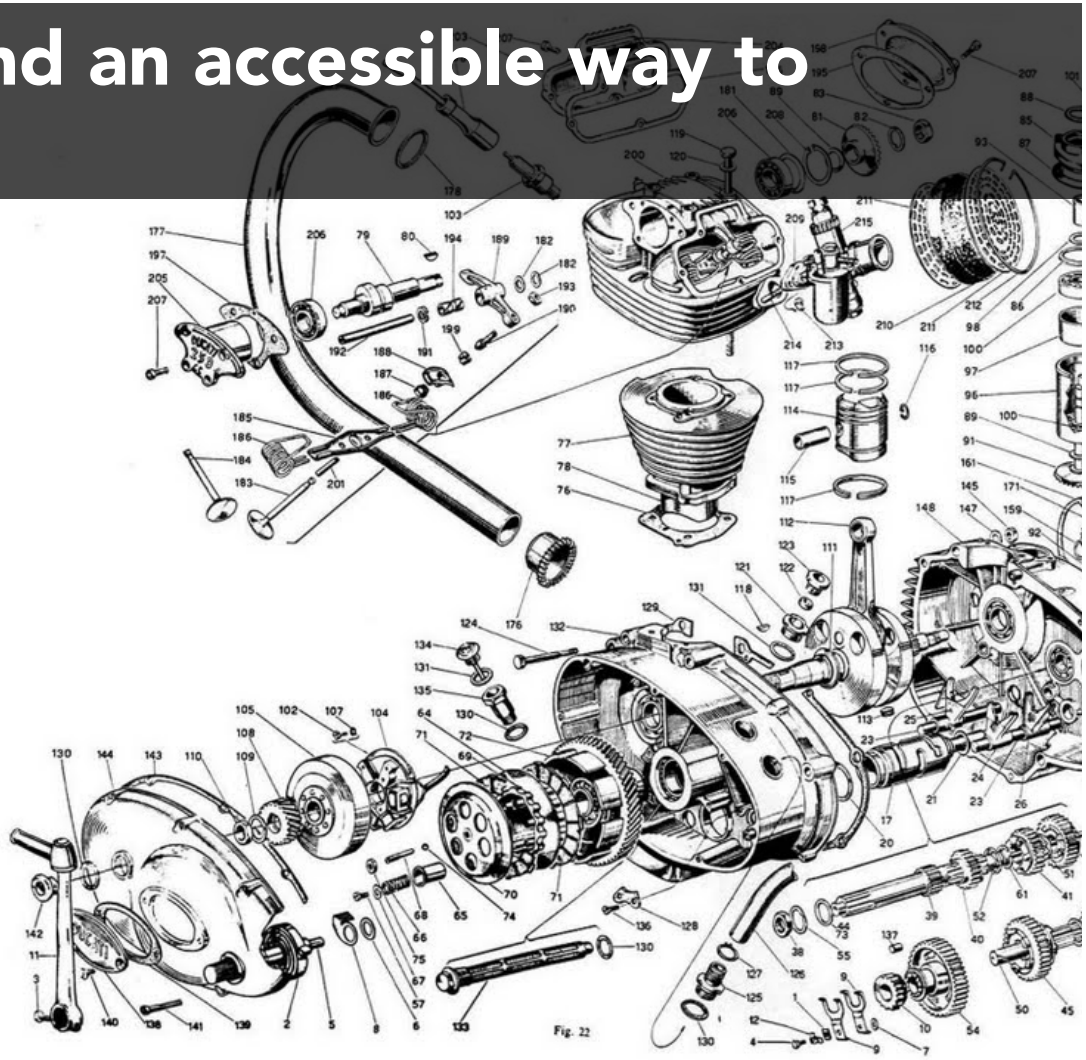
Based on: http://www.visualisingdata.com/2014/05/the-challenges-of-teaching-data-visualisation/


Andy Kirk, visualisingdata.com
People might seek teaching in data visualization
because they find themselves doing this...

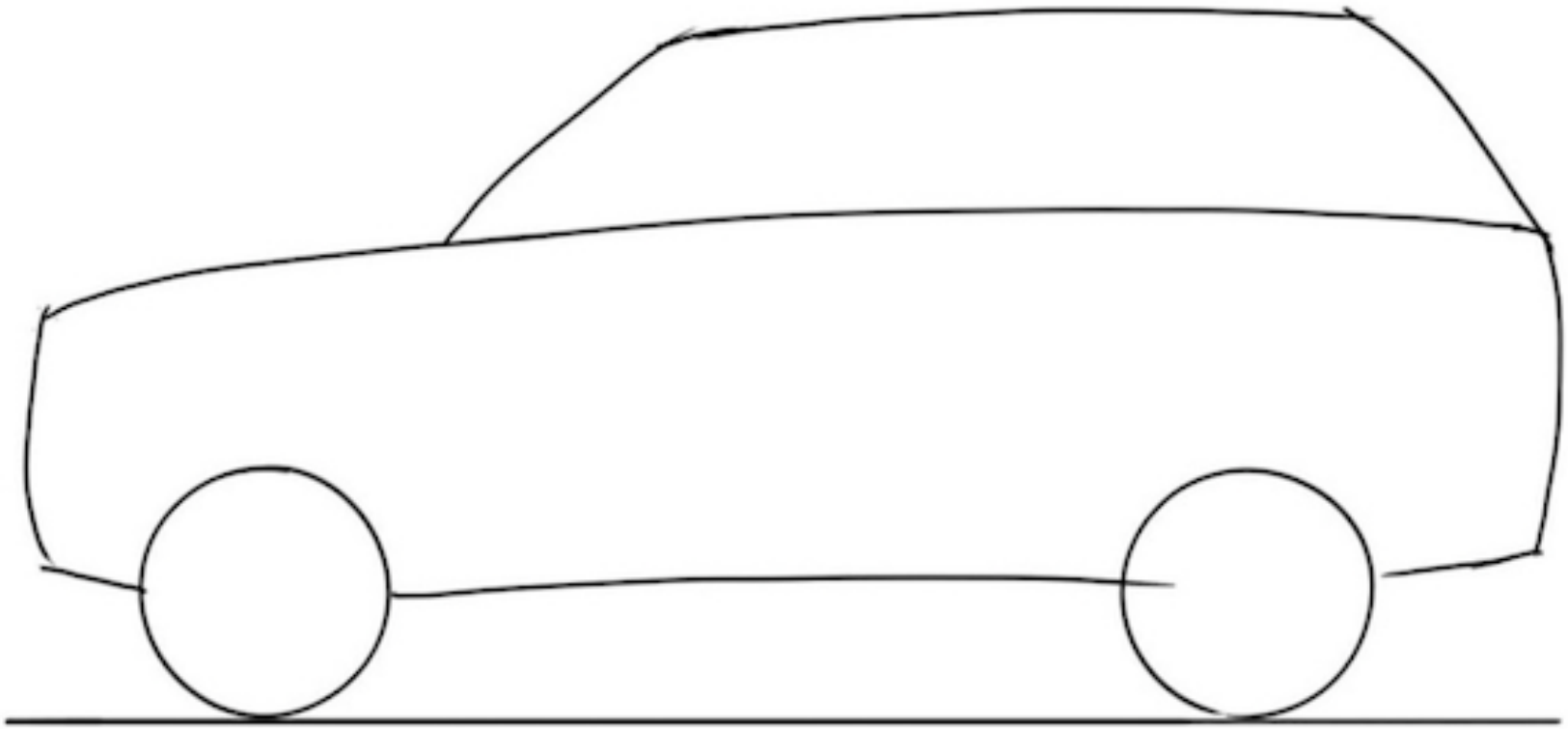
So you've got to find an accessible way to communicate this...



Andy Kirk, visualisingdata.com



Without overly reducing it to this...



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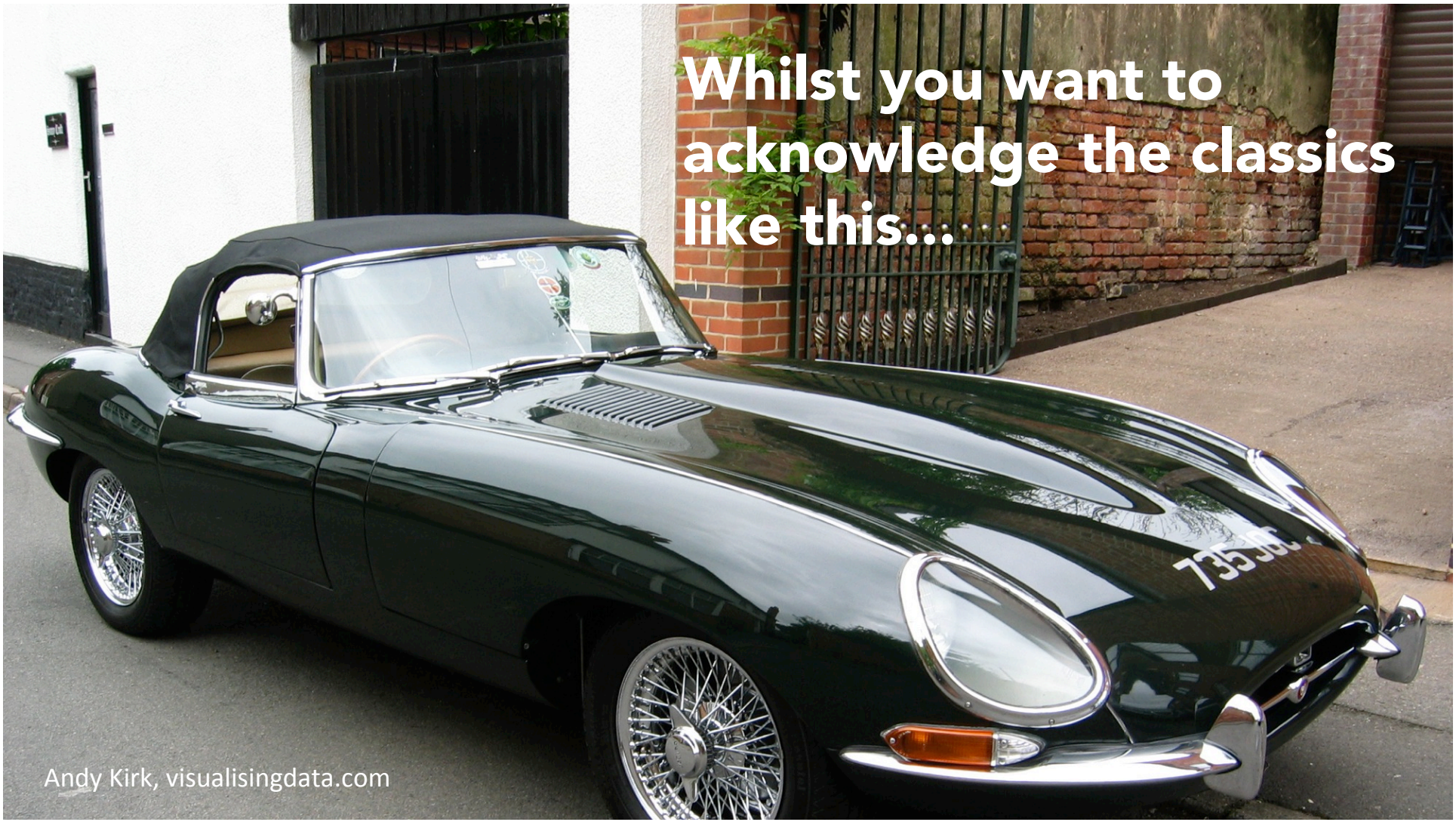
You know that some people might be wanting to do this...
Andy Kirk, visualisingdata.com

But they really need to appreciate how and when to do this...

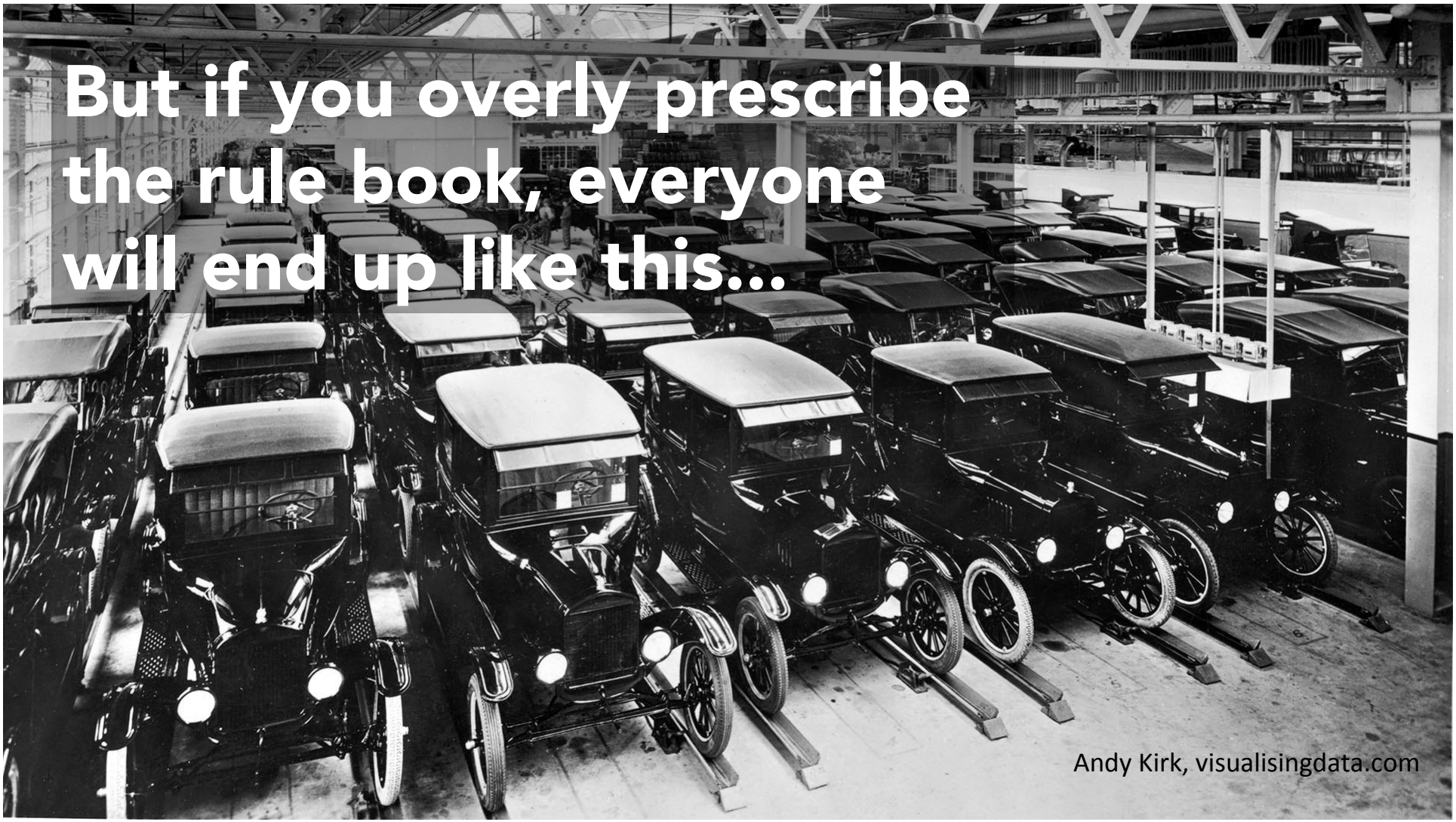
Andy Kirk, visualisingdata.com


Whilst you want to acknowledge the classics like this…
Andy Kirk, visualisingdata.com


You're also keen to give people a glimpse into this...
Andy Kirk, visualisingdata.com

You have to be respectful of this...

Andy Kirk, visualisingdata.com


But if you overly prescribe the rule book, everyone will end up like this...
Andy Kirk, visualisingdata.com


When really you want to encourage flexibility to do this...
A1
A3
A4 Saloon
A5 Coupé
New A6 Saloon
A7 Sportback
Andy Kirk, visualisingdata.com


Ultimately, you want people to leave with the confidence, know-how and aspiration to create this...
Andy Kirk, visualisingdata.com

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InfoVis @ University of Michigan

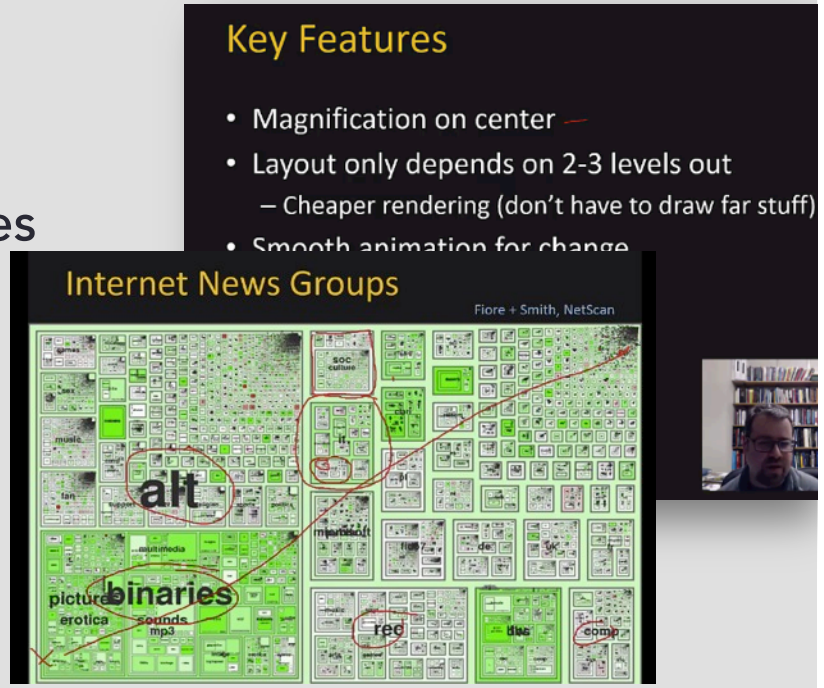
- Started as one course in the School of Information
  - Cross-listed in EECS
  - Only class @UofM
  - 50-60 students/semester
  - Lab sections restricted to ~30 students
  - Taught over two semesters or as two labs
- Student population
  - Mostly Masters (smattering of PhD and undergrad)
- Course format
  - 3 hours (often all at once)
    - 1.5 hours "lecture"
    - 1.5 hour lab
      - 1/3 semester: pair programming
      - 2/3: design
- Grades
  - Quizzes
  - Participation
  - Programming labs
  - Individual + group projects

Class Philosophy

Active learning

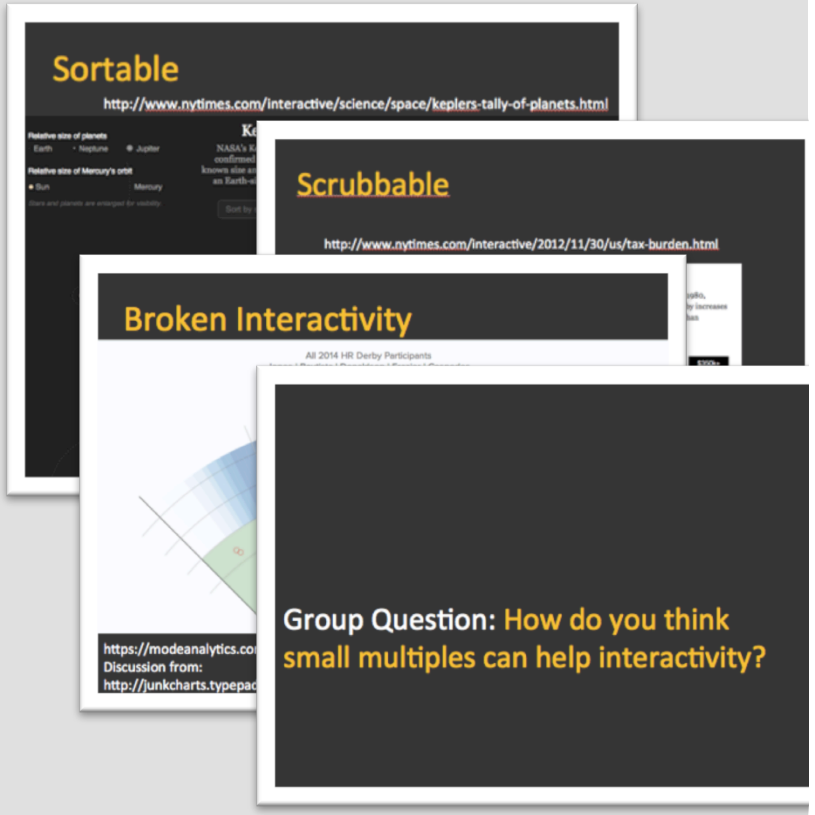
Active Learning: Pre-Lecture

- Video lectures
  - 2-3×10-15 minutes (30-45 minutes total)
  - Available at start of semester
  - Readings + clear learning objectives document
- High stakes (but relatively easy) weekly quizzes
  - Taken directly out of learning objectives
  - 25% of grade



Active Learning: Lectures

- Groups
  - Randomly assigned
  - 5-6 students
- I talk – They talk
  - Negligible overlap with videos
  - Few slides digging into concept or new example
  - Followed by group questions
    - 5 minute breakout then class discussion



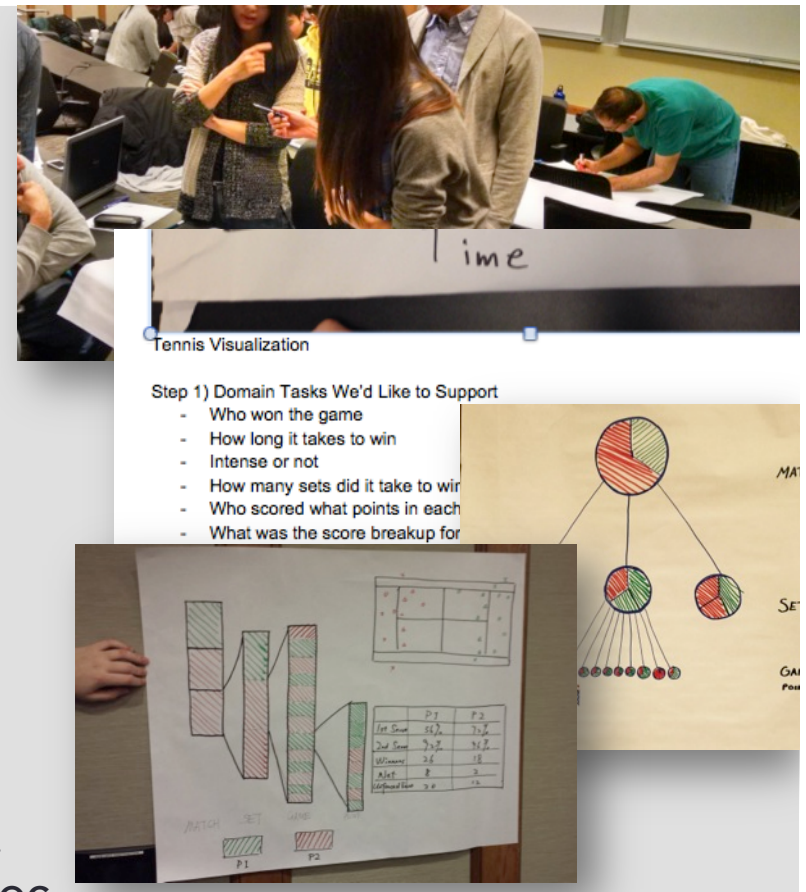
Class Philosophy

Active learning

Design Practice

Design Practice

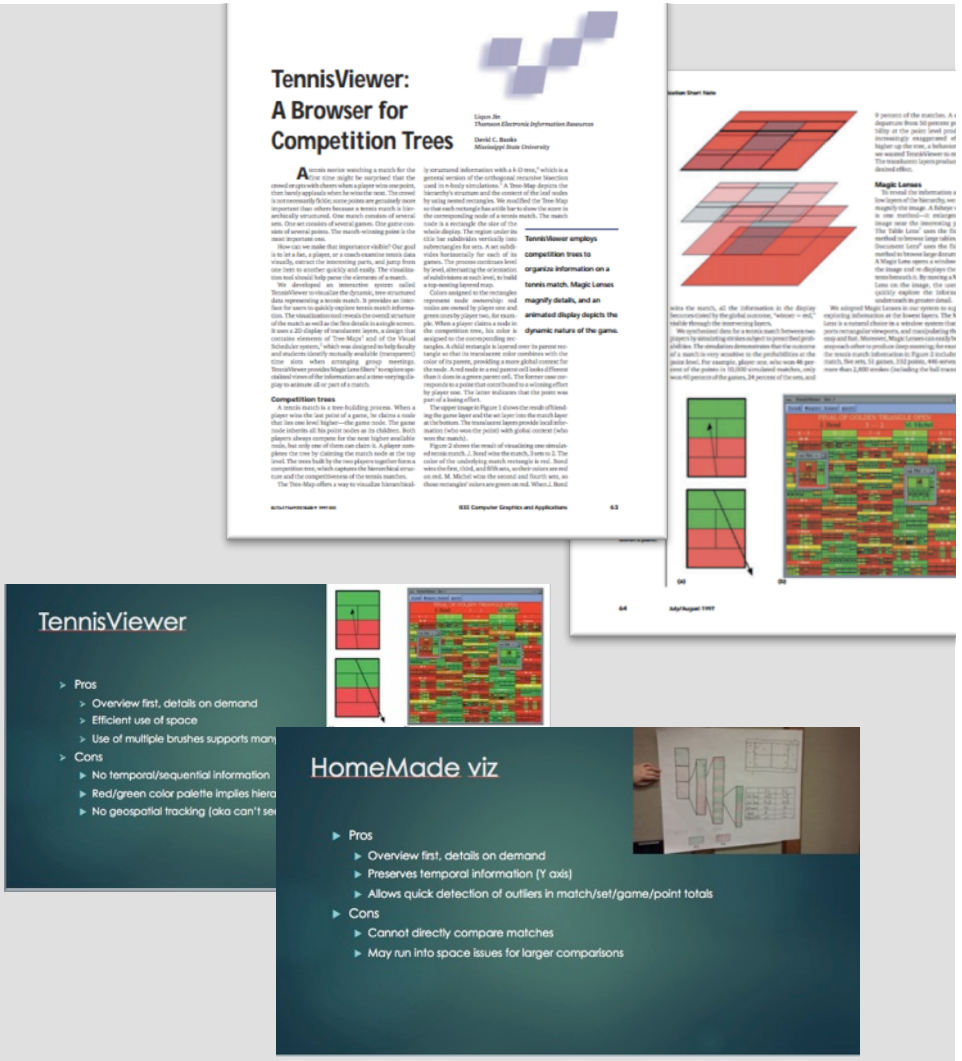
- Put what you learn into immediate practice
- Topic of the day (e.g., "hierarchical data")
  - Show examples, dig into techniques
- Specific (guided) design problem
  - Problem "stolen" from paper (they haven't read)
  - Instructions on how to break apart problem
    - Domain, abstract problems, encoding, etc.
  - Notes (and images) in shared Google doc
  - All-class or paired discussion at end



"Visualize a tennis match"

Design Practice

- Response reading for *next class*
  - Read the "professional solution"
  - 5-slide/5-minute presentation
    - Compare your solution to theirs
  - Forces deeper thinking on reading
    - They don't go immediately to "why this system sucks"
- Students *randomly(!)* chosen to present and lead discussion for next class
  - Short discussion



Some lessons/thoughts

- Active learning/Design practice
  - Improved learned (they test better)
  - The project quality improved
  - I can adapt the class dynamically/not rushed
- Designs problems need to be
  - Realistic
  - Constrained
  - But not too constrained
  - Repeat the high-level design process
- Clear learning objectives
- Incentivized behavior
  - Quizzes, random presentation, etc.
- No Laptops!
- Don't make big changes in one semester!

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Course "blog":
http://si649.cond.org