INF385T

THURSDAYS, 3-6 PM

ANDREA CATO
a.s.cato@gmail.com
include course # in subject
online office hours:
Tues 4 PM & by appt

Online through Canvas
Unique #27240

DATA STORYTELLING

WHO NEEDS TO TELL STORIES WITH DATA?

Data storytelling is more than sharing data—at its most simple, it's about designing charts and tables that make sense to the people who will be using them and help those people make better, faster decisions.

While making a chart is as easy as a few clicks, doing it well requires much more. There is a science to how our eyes and minds process information as well as an art to making good graphic design choices. This comes together in an effective data presentation when the work is readable, usable, and above all actionable—not just aesthetically pleasing (though we'll certainly address that too).

As information professionals, we are well-positioned to understand and design for the needs of our users, to interrogate our data sources thoughtfully, and to ask future-thinking questions. This course will also draw on elements from data journalism, cognitive psychology, user experience, graphic design, business, and more. This multidisciplinary approach will take us on a grand tour that will touch on many aspects of data analysis and will serve as an excellent introduction to other data-oriented courses in the iSchool master's program.

Why should you take this course? Whether you're interested in a career in libraries, archives, UX, information architecture, information security, or another field, you will need to analyze data and tell stories with data. You might have ticketing data to share, usage logs to query, or collection management decisions to make. Throughout your career, you will make recommendations to your colleagues and management using data, and you will want to present a compelling case. Whether or not this is the only data-centric class you take in your time at the iSchool, I hope you will gain skills that will serve you well in the rest of your professional career.

There are no prerequisites for this course other than curiosity, the ability to work independently, and the desire to build your professional toolkit. No programming experience is required. If you are a complete novice with data analysis and visualization, that's perfect! If you're experienced with data viz best practices but eager to build your expertise in communicating better, that works too, but I encourage you to take on any optional challenges in assignments and also suggest further modifications so they can be appropriately stimulating for your skill level. *Allons-y!*[i]

LEARNING OBJECTIVES

- Effectively do exploratory and explanatory data analysis
- Craft thoughtfully selected charts and charts that illuminate the data
- Design an enlightening, interactive dashboard for a targeted audience
- Implement core concepts of usability and accessibility
- Apply the basics of clean layout and graphic design
- Express creative thinking by producing an innovative data representation
- Learn the basics of working with clients in a professional setting
- Build foundational skills for presenting to an audience
- Work with various data analysis and visualization tools (specifically Excel and Tableau) and pick the best tool for the job
- Explore foundational and new theory behind data storytelling and visualization, and then implement these as best practices

COURSE MATERIALS

Hardware and software

Under normal circumstances, we would be meeting in the iSchool computer lab where you would have access to the desktop machines and the software required for the course even if you do not have a laptop.

However, the software packages we will use are freely available for students. Tableau Desktop and Tableau Prep activation keys will be provided to you. You can download and install Microsoft Office through the university's Office 365 portal. Your device should meet the minimum requirements to run Tableau Desktop. If you are concerned about this at the beginning of the semester, you can download and install Tableau Public, the free version of Tableau Desktop, to see if it runs on your machine.

Other supplies

A normal semester involves a lot of small group activities and low-fidelity prototyping. Leaving all of it out would be a disservice to you all, so I want to transition as much of this to our online environment as is feasible. Please be prepared with the following:

- A functioning webcam and mic
- A Sharpie marker (or alternative that will clearly be visible if you draw with it and hold the drawing up to your webcam)
- Paper for drawing (a lined notebook is fine)
- A pack of markers (something like this is fine)

Book to purchase

This is a basic graphic design book that explains important design concepts really well. It will be a necessary resource when revising your work or when providing feedback to your peers. Used copies are fine.

Williams, R. (2015). *The Non-Designer's Design Book*, Fourth Edition. San Francisco, CA: Peachpit Press. ~$35

Books provided for you

Our main textbook for the course is *Storytelling with Data* by Cole Nussbaumer Knaflic. We'll also be reading works from other experts in the field of data visualization, from classics like Edward Tufte to contemporary experts in academia and industry. They were carefully selected to complement the other course content, and it is expected that you will complete all readings for this course. The following will

comprise most of our readings and are available through links on Canvas and through UT Libraries. See the course schedule for a full list of readings.

Knaflic, C. N. (2015). *Storytelling with data: a data visualization guide for business professionals*. Hoboken, NJ: Wiley. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057996053606011

Andrews, R.J. (2019). *Info we trust*. Hoboken, NJ: Wiley.

Schwabish, J. (2017). *Better presentations: a guide for scholars, researchers, and wonks*. New York, NY: Columbia University Press.

Tufte, E. R. (2001). *The visual display of quantitative information, 2nd edition*. Cheshire, CT: Graphics Press.

Wexler, S. et al. (2017). *Big book of dashboards*. Hoboken, NJ: Wiley. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057997829306011

Yau, N. (2013). *Data points: visualization that means something*. Hoboken, NJ: Wiley. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057933631806011

COURSE ASSIGNMENTS

Brief descriptions of course assignments appear below. More details will be provided in class and on Canvas.

Discussion questions (5% of final grade): Prior to each class, respond to at least two of the discussion questions based on the upcoming class's readings. Your responses will give me a sense of what you are most interested in, and they will be used as the basis for group discussions the next day. Your responses are due at midnight the two days before class. You'll be automatically assigned to a peer to give comments on one of their answers. A thread for each class's questions is available on Canvas.

Data diary (10% of final grade): This assignment addresses two important elements: that data surrounds us, and that storytelling with data is as much of an art as it is a science. Before we dive into best practices, let's address the fun, creativity, beauty, and silliness that's instrumental to the field. Research and gather data about yourself on a topic of your choice and keep a data diary in Excel for a week. Examples include the music you listen to, your phone app use, how much time you spend on coursework, how much media you

Data diary created by Shashank Jain in Fall 2019 that shows the time he spent on various activities in a week

Data diary created by Ssu-Ting "Angie" Wang in Fall 2019 that illustrates the liquids she consumed in a week

consume and what kinds, etc. Build a data presentation to showcase what you've collected. Do not use Excel or Tableau to produce your final deliverable.

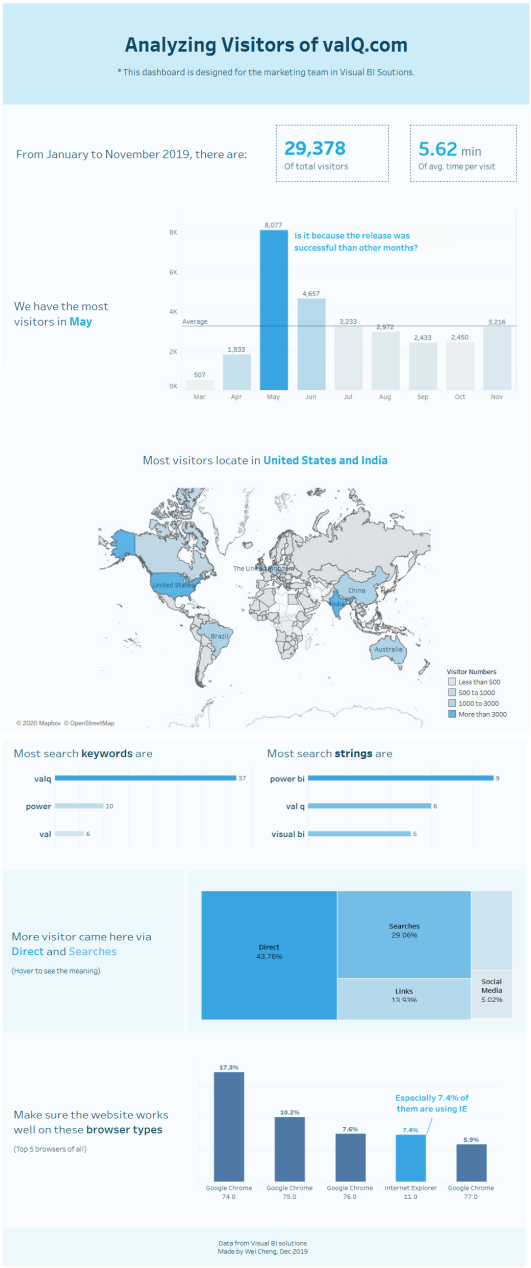
Excel and Tableau assignments (30% of final grade): A series of short analytical assignments designed to complement and reinforce the tutorials and hands-on work done in class. Specifics will be available on Canvas for each assignment.

Visualization blog posts (5% of final grade): Examining the works of others is a great way to develop your eye and build your own skillset. Write a post on Canvas about a data presentation you have found (350ish words). Address what data are being shown (and if the source is cited), who you think the audience is, the goals of the data presentation, and why/why not the data presentation is effective.

The Moth story exercise (5% of final grade): Analyzing examples of storytelling can help us learn how to recognize narrative elements and opportunities to integrate narrative in our own work. In this short assignment, you'll analyze several short recordings of live storytelling from The Moth, a podcast and series of live storytelling events hosted around the country.

Short data viz project (15% of final grade): Build a polished data visualization based on a topic of your choice using a dataset of your choice. You will present the dashboard to your classmates in a short presentation recorded in Panopto. Feedback on your classmates' dashboards and presentations will be part of your grade. The point of this assignment is two-fold: to provide a low-stakes opportunity to build a data visualization about something you're really excited about and to focus on good presentation skills

Makeover Monday dashboard (5% of final grade): Makeover Monday is a weekly online event where a data presentation and the dataset behind it are released, and you're challenged to make it better! During this timed in-class activity, you will create a Tableau dashboard based on a dataset you've never seen before and publish your dashboard to Tableau Public.



Final project created by Wei Chang in Fall 2019 that analyzes visitor traffic for a website

Final project summary, deliverables and presentation (25% of final grade): This culminating project is a hands-on experience to design, prototype, and develop a complex example of a data visualization dashboard with storytelling elements that will be an asset to your professional portfolio. Your project must have a clear and specific audience. The final project includes the data presentation, associated

documentation, and a presentation to the class. Your formal written feedback on a peer's draft will also be included in your grade.

GRADING

Here's how to do your best on course assignments:

- Well before the deadline, read the assignment instructions in detail. Make note of anything that sounds particularly challenging. Reach out to me if you need clarity about the assignment.
- If you have questions while you work, first start by consulting your study buddy. For software-related questions, Googling often yields helpful results. If you exhaust both of these options, reach out to me at least a day before the assignment is due.
- Before you hand in your work, read the instructions again to make sure you completed everything.

Here are the primary things I will look for when I grade:

- Did you make thoughtful design choices, putting the best practices from class and from our readings to use?
- Did you complete all components of the exercise per my instructions?

ASSIGNMENT POLICIES

- Unless otherwise specified, turn in assignments through Canvas.
- There will be no group projects. You'll do plenty of these at the iSchool, and I want everyone to have a chance to develop all of the skills in the course.
- While these assignments will represent your individual effort, I encourage you to see the advice and feedback of your peers.
- Previously submitted assignments cannot be resubmitted with edits and corrections for a higher grade unless we discuss it in advance of your resubmission.
- Late assignments will be docked 10% for each day delayed.

OTHER COURSE POLICIES

Be excellent to each other[ii]**:** Treat others as you would like to be treated. Give presenters and your classmates your full attention. Be courteous and thoughtful with your feedback. Limit computer/phone use to course-related activities.

Help one another: You bring your unique experiences to this course, and I encourage you to share that perspective with the class. I also highly recommend you select a study buddy in the course. In addition to sharing notes if either of you miss a class, having a peer with whom you can discuss ideas and go to for help is invaluable.

Steal like an artist but cite your sources: To be clear, this is not an endorsement of plagiarism but instead acknowledgement that that it is a rare thing for a work to be truly original—we're often inspired by the creations of others. If your work draws from someone else's work in any way, cite it.

Communicate with me: Email is the most reliable way to reach me. Please include the course number (INF385T) in the subject line. Allow a 24-hour window for responses.

I'm here to help you: Take advantage of it by requesting office hours to talk through any aspect of the course you don't understand. Tableau is deceptively complicated, and you shouldn't feel embarrassed if you don't understand something immediately.

Adopt an attitude that feedback is always welcome: Give thoughtful constructive criticism to your peers, and be prepared to receive it too. This goes for me as well. A short email to say, "I really liked that activity" or "I didn't get that lecture at all—it needed more examples" is very helpful for me. I'll request feedback from you on the course mid-way through the semester, but please don't wait if something crosses your mind.

Attendance: While I will not take attendance, please be aware that a substantial portion of course content includes hands-on labs and activities. As a result, missing classes and not participating in activities can impact your performance and result in a lower grade. It's your responsibility to look on Canvas and/or check in with your classmates for notes and assignments you missed.

Recordings: Class recordings are reserved only for the use of members of this class (students, TAs, and the instructor) and only for educational purposes. Recordings should not be shared outside the class in any form. Violation of this restriction could lead to Student Misconduct proceedings.

Preferred names and pronouns: I will gladly address you by your preferred name and pronouns. Please let me know early in the semester so I can make changes to my records, and please correct me gently if I make a mistake.

UNIVERSITY POLICIES

Religious holy days: A student who misses classes or other required activities, including examinations, for the observance of a religious holy day should inform the instructor as far in advance of the absence as possible, so that arrangements can be made to complete an assignment within a reasonable time after the absence.

Students with disabilities: Please notify your instructor of any modification/adaptation you may require to accommodate a disability-related need. You may find out more information on the Services for Students with Disabilities website: http://diversity.utexas.edu/disability/ and/or http://diversity.utexas.edu/disability/how-to-register-with-ssd/

Policy on scholastic dishonesty: Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, please visit the Office of Student Conduct and Academic Integrity website at http://deanofstudents.utexas.edu/conduct/.

Use of e-mail for official correspondence to students: All students should be familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. The complete text of this policy and instructions for updating your e-mail address are available at http://www.utexas.edu/its/policies/emailnotify.html .

University of Texas honor code: "As A Student Of The University Of Texas At Austin, I Shall Abide By The Core Values Of The University And Uphold Academic Integrity."

ACKNOWLEDGEMENTS

We acknowledge that the iSchool sits on indigenous land. The Tonkawa lived in central Texas and the Comanche and Apache moved through this area. Today, various indigenous peoples from all over the globe visit Austin and/or call it home. We are grateful to be able to study and learn on this piece of Turtle Island. Since some of our classes are online, you may be contributing from other tribal lands. Here is a map that may help you in identifying the indigenous peoples of the land on which you study: https://native-land.ca/

This course and all its trappings owe a substantial debt to Dr. Diane Bailey. Dr. Bailey formulated Presenting Information, this course's predecessor.

TENTATIVE COURSE SCHEDULE

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
1 8/27	Intro	What is data visualization, and how do our eyes and mind work together to perceive information?	Meeks, E. (2018). What charts do. Retrieved from https://medium.com/nightingale/what-charts-do-48ed96f70a74? Read Knaflic, C. (2015). Chapter 1: the importance of context. *Storytelling with data*. Hoboken, NJ: Wiley. Healey, C. & Enns, J. (2012). Attention and visual memory in visualization and computer graphics. *IEEE transactions on visualization and computer graphics 18:7*. Retrieved from https://www.csc2.ncsu.edu/faculty/healey/download/tvcg.12a.pdf	Visualize 2 numbers Excel tutorial: basics	
2 9/3	Simple statistics and exploratory analysis	How do we approach an unfamiliar dataset?	Yau, N. (2013). Chapter 1: understanding data. *Data points: visualization that means something*. Hoboken, NJ. Broman, K.W. & Woo, K.H. (2017). Data organization in spreadsheets. *The American statistician 72*. doi: 10.1080/00031305.2017.1375989 Tufte, E. R. (2001). Graphical excellence. *The Visual display of quantitative information.* Cheshire, CT: Graphics Press, 13-51. Start thinking about your data diary	WTFcsv Excel tutorial: tables and charts	Numbers introduction Excel exercise #1
3 9/10	Charts and tables	How do we choose a good chart type?	Knaflic, C. (2015). Chapter 2: choosing an effective visual. *Storytelling with data*. Hoboken, NJ: Wiley. Cleveland, W., & McGill, R. (1984). Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods. *Journal of the*	Tableau tutorial: basics	Visualization blog post Excel exercise #2

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
			American Statistical Association, 79(387), 531-554. doi:10.2307/2288400 Few, S. (2012). "Table design." *Show me the numbers: designing tables and graphs to enlighten*. Burlingame, CA: Analytics Press. Kosara, R. (2016). An illustrated tour of the pie chart study results. Retrieved from https://eagereyes.org/blog/2016/an-illustrated-tour-of-the-pie-chart-study-results Start thinking about topics and datasets for project #1		
4 9/17	Audience and context	Who are we designing for, and how can we use that information to make our work better?	Makulec, A. (2018). Heritage -> health. *2018 Tapestry PechaKucha*. Retrieved from https://www.youtube.com/watch?v=-aAhzgBjQX0 Peck, E., Ayuso, S.E., & El-Etr, O. (2019). Data is personal: attitudes and perfections of data visualization in rural Pennsylvania. *Proceedings of the 2019 CHI conference on human factors in computing systems*. doi: 10.1145/3290605.3300474 Tufte, E. R. (2001). Sources of graphical integrity and sophistication. *The Visual display of quantitative information.* Cheshire, CT: Graphics Press, 79-90.	Remix a viz Tableau tutorial: calculated fields	Data diary Tableau exercise #1
5 9/24	Fonts, colors, accessibility	How can we make our charts and dashboards look polished and professional?	Knaflic, C. (2015). Chapter 4: focus your audience's attention, Chapter 5: think like a designer, & Chapter 6: dissecting visual models. *Storytelling with data*. Hoboken, NJ: Wiley. Cawthon, N. & Moere, A. V. (2007). The effect of aesthetic on the usability of data visualization. *2007 11th International Conference Information Visualization (IV '07)*. doi: 10.1109/IV.2007.147	Branding activity Tableau tutorial: fonts, colors, dashboards, parameters	Tableau exercise #2 Provide a summary of your project #1 data topic on Canvas

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
			Skim UT Austin branding guidelines: https://utexas.app.box.com/v/brandcampaign/file/218170563404		
6 10/1	Explanatory analysis	How do I turn data into a story?	Knaflic, C. (2015). Chapter 7: lessons in storytelling. *Storytelling with data*. Hoboken, NJ: Wiley. Callahan, S. (2016). The role of stories in data storytelling. Retrieved from http://www.anecdote.com/2016/08/stories-data-storytelling/ Andrews, R.J. (2019). Chapter 17: Imagination to image & Chapter 18: focus attention. *Info we trust*. Hoboken, NJ: Wiley. Gastineau, D. (2019). How to use storytelling conventions to create better visualizations. Nightingale. Retrieved from https://medium.com/nightingale/how-to-use-storytelling-conventions-to-create-better-visualizations-45177ae517ba Investigate supplemental data sources for your project	Tableau tutorial: maps and custom shapes	Tableau exercise #3: redo this chart The Moth story exercise
7 10/8	Feedback	How can I best give and receive feedback?	Knaflic, C. (2015). Chapter 8: pulling it all together & Chapter 9: case studies. *Storytelling with data*. Hoboken, NJ: Wiley.	Tableau tutorial: dates, groups, sets, dual axis charts, table calculations	Project #1 prototype
8 10/15	Ethics, cognitive bias, and objectivity of data analysis and visualization	Are data sets objective? How can people lie (intentionally or not) with data? How can we be honest communicators?	Chalabi, M. (2017). "Making sense of too much data." Retrieved from https://www.ted.com/talks/mona_chalabi_3_ways_to_spot_a_bad_statistic?referrer=playlist-making_sense_of_too_much_data Jerven, M. (2013). "Facts, assumptions, and controversy: lessons from the datasets." *Poor numbers: how we are misled by African development statistics and what to do*		Peer feedback on project #1 Tableau exercise #4-executive dashboard

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
			about it. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057975280306011 D'Ignazio, C. (2015). What would feminist data visualization look like? Retrieved from https://civic.mit.edu/2015/12/01/feminist-data-visualization/ Kong, H., Liu, Z., & Karahalios, K. Frames and slants in titles of visualizations on controversial topics. *Proceedings of the 2018 CHI conference on human factors in computing systems*. doi: 10.1145/3173574.3174012		
9 10/22	Presenting and doing it well	How do I plan a talk to deliver information well?	Schwabish, J. (2017). Chapter 1: designing your presentation, Chapter 4: the text slide, Chapter 6: the image slide, Chapter 7: the scaffolding slides, Chapter 8: presenting, Chapter 9: technical nitty-gritty. *Better presentations: a guide for scholars, researchers, and wonks*. New York, NY: Columbia University Press.	Tableau tutorial: dates, groups, sets, dual axis charts	Provide a summary of your final project data topic on Canvas
10 10/29	Usability	How can we make the products we design meet the needs of the people who will use them?	Goodwin, K. (2009). "Chapter 5: Understanding the business." Designing for the digital age. Hoboken, NJ: Wiley. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057965958806011 Pages 1-37 from Goodwin, K. (2009). "Chapter 7: Understanding potential users and customers." Designing for the digital age. Hoboken, NJ: Wiley. Retrieved from https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057965958806011 Goodwin, K. (2009). "Chapter 23: Evaluating your design." Designing for the digital age. Hoboken, NJ: Wiley. Retrieved from	Tableau tutorial: table calculations	Project #1 and presentation due

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
			https://search.lib.utexas.edu/permalink/01UTAU_INST/171befj/alma991057965958806011		
11 11/5	How to pick a tool	With so many options available, how do we choose the right tool for the job?	Rost, L.C. (2016). What I learned recreating one chart using 24 tools. Retrieved from https://source.opennews.org/articles/what-i-learned-recreating-one-chart-using-24-tools/ Skim Gartner Magic Quadrant for Analysis and Business Intelligence Platforms: https://www.gartner.com/doc/reprints?id=1-68720FP&ct=190213&st=sb	Tableau tutorial: advanced dashboard actions, mobile development	Peer feedback on final project summary due Tableau exercise #5
12 11/12	Working with clients	How can we establish ourselves as good collaborators and guide a project toward success?	Sarikaya, S. et al. (2018). What do we talk about when we talk about dashboards? *IEEE transactions on visualization and computer graphics 25:1*. doi: 10.1109/TVCG.2018.2864903 Read Wexler, S. et al. (2017). Chapters 8, 10, 20. *Big book of dashboards*. Hoboken, NJ: Wiley. doi: 10.1002/9781119283089		
13 11/19	Advanced Tableau	Can I do this in Tableau? (Maybe)		Tableau tutorial: set actions, parameter actions, regular expressions	Final project prototype and draft documentation due
14 11/26	No class—T-Day break				
15 12/3	Makeover Monday	How do I keep getting better?	Ellis, S.E. & Leek, J.T. (2017). How to share data for collaboration. *The American statistician*, 72, 53-57. doi: 10.1080/00031305.2017.1375987 Knaflic, C. (2015). Chapter 10: final thoughts. *Storytelling with data*. Hoboken, NJ: Wiley. Meeks, E. (2018). Tapestry keynote: Third wave data visualization. Retrieved from https://www.youtube.com/watch?v=itChfcTx7ao	Makeover Monday	Peer feedback on final project

Week# Date	Topic	Guiding question	Readings to be done before class	In-class activity	Due before class
16 12/7	Talks, course evals, and wrap up		Final presentations, course evaluations, and wrap up		Project & documentation

RECOMMENDATIONS FOR ADDITIONAL READING

This class of course only scratches the surface of data and data storytelling. In addition to seeking out additional iSchool courses to build your data skills, consider the following resources. This list is not exhaustive.

TABLEAU BLOGS AND RESOURCES

makeovermonday.co.uk

workout-wednesday.com

ryansleeper.com

vizwiz.com

dataplusscience.com

datarevelations.com

BLOGS AND OTHER WEBSITES

storytellingwithdata.com
economist.com/graphic-detail
junkcharts.typepad.com
pudding.cool
storytellingwithdata.com
visualizingdata.com
flowingdata.com
Informationisbeautiful.net
makeovermonday.co.uk
reddit.com/r/DataIsUgly
theatlas.com
viz.WTF

BOOKS

Practical

Berinato, S. (2016). *Good charts: the HBR guide to making smarter, more persuasive data visualizations*. Brighton, MA: Harvard Business Review Press.

Cairo, A. (2016). *The functional art: an introduction to information graphics and visualization*. San Francisco, CA: New Riders.

Cairo, A. (2016). *The truthful art: data, charts, and maps for communication*. San Francisco, CA: New Riders.

Few, S. (2013). *Information dashboard design*. El Dorado Hills, CA: Analytics Press.

Kriebel, A. & Murray, E. (2018). *#MakeoverMonday*. Hoboken, NJ: Wiley.

Beautiful

Andrews, R..J. (2019). *Info we trust.* Hoboken, NJ: Wiley.

Lupi, G. & Prosavec, S. (2016). *Dear data*. New York, NY: Princeton Architectural Press.

McCandless, D. (2010). *Information is beautiful*. New York, NY: HarperCollins Publishers.

McCandless, D. (2010). *Knowledge is beautiful*. New York, NY: HarperCollins Publishers.

Ethics and numeric literacy

Cairo, A. (2019). *How charts lie*. W.W. New York, NY: Norton & Company.

Criado-Perez, Caroline. (2019). *Invisible women: data bias in a world designed for men*. New York, NY: Abrams Press.

Huff, D. (1954). *How to lie with statistics*. W.W. New York, NY: Norton & Company.

Paulos, J.A. (2013). *A mathematician reads the newspaper.* New York, NY: Basic Books.

Rosling, H. (2018). *Factfulness: ten reason we're wrong about the world—and why things are better than you think*. New York, NY: Flatiron Books.

PODCASTS

datastori.es
storytellingwithdata.com/podcast
99% Invisible
PolicyViz

ORGANIZATIONS

Data Visualization Society
Institute of Electrical and Electronics Engineers (IEEE)
Association for Computing Machinery (ACM)

CONFERENCES

Tableau Conference
IEEE Vis
Malofiej
Tapestry Conference (currently on hiatus)

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i Davies, R. (Writer) & Hawes, J. (Producer). (2005). The Christmas invasion [*Doctor Who*]. London, United Kingdom: BBC One.
ii Herek, S. (Director). (1989). *Bill & Ted's Excellent Adventure* [Motion picture]. United States: Orion Pictures.