# Lecture 1.A: Introduction to the Course

LSC 563: Data Visualization – 2022

1

# About Me

Faculty page

2

# My Role in Data Analytics

- Metadata
- Benchmarking and Assessment
- Data Services
- Teaching
- Product Development and Support

3

# Class Logistics

4

## Class Schedule and Location

- Class: Wednesdays 5:10PM - 7:40PM
- Location: Hannan 134
- Persistent Zoom Link

5

## Class Format

- Lecture: 5:15 – 6:30
- Break: 6:30 – 6:45
- Lab: 6:45 – 7:30
- Class Week runs Wed – Tue
- Assignments due by 23:00 on due date (always Tuesday before class)
- Content for following week is posted each Thursday



6

# Class Format: Schedule

- Lessons 1 -3: Science of visualization and color
- Lessons 4 – 5: Data and EDA
- Lessons 6 – 7: Basics of graphs
- Lesson 8 – 10: Distributions and Associates
- Lesson 11: Time series
- Lessons 12 – 13: Geospatial

Version: 2022

| Week | Date | Lecture topic | Assigned Readings | Labs | Tasks, Assignments (Before Class) |
|---|---|---|---|---|---|
| W1/L1 | 01/12/22 | • Introduction to course<br>• Introduction to data visualization<br>• Introduction to vision and its role in visualization | | | |
| W2/L2 | 01/19/22 | • Color Perception and Attributes of Color | • Read: Wilke, C. (2019). Color Scales. In Fundamentals of data visualization: a primer on making informative and compelling figures (First edition. ed., pp. 27-36).<br>• Read (Optional): Ware, C. (2019). Color. In Information Visualization: Perception for Design (4th ed., pp. 115-122).<br>• Read: Cédric Scherer, "Colors and emotions in data visualization" | • L0: Installing R and Downloading Data | • |
| W3/L3 | 01/26/22 | • Preattentive Processing and Gestalt<br>• R markdown | • No assigned readings this week | • L1: Introduction to R and RStudio | • Work through lab L0 |
| W4/L4 | 02/02/22 | • Data Types and Levels of Measurement<br>• Summarizing data in R | • Read: Wilson, G., Bryan, J., Cranston, K., Kitzes, J., Nederbragt, L., & Teal, T. K. (2017). Good enough practices in scientific computing. PLOS Computational Biology, 13(6)<br>• Read: Healy, K. (2018). Look at the Data. In Data visualization: a practical introduction (pp. 1-9; 9-11).<br>• Read: Healy, K. (2018). Get Started. In Data visualization: a practical introduction (pp. 32-49).<br>• Read: RHealy, K. (2018). Graph Tables, Add Labels, Make Notes. | • Quiz 1 (Lesson 1 – Lesson 3)<br>• L2: Working with Data and Making a Plot | • Lab L1 due in Blackboard |

7

# Teaching Expectations

- Creating a safe and positive learning environment
- Being prepared
- Following the policies outlined in the syllabus
- Finding the answers (by the next class)
- Checking in during my lectures

Image source

8

# Student Expectations

- Being prepared
- Asking for help (before it is too late)
- Being of help (non-graded assignments): “See One, Do One, Teach One”
- Keeping an open mind
- Adhering to the honor code

LeCompte, M., et. al. (2019).

Image source

9

# Course Adjustments

- Might be needed to maximize learning opportunities for students and/or better serve the goals of the course
- Syllabus may likewise be modified at the discretion of the instructor
- Adjustments will be communicated to students in class and on Blackboard with as much advance notice as possible



10

# Readings: Textbook - Theory

- 3rd edition is available electronically from the CUA Library, but there have been some changes, and a completely new chapter.
- Don't need to buy, I will give you everything you need to know

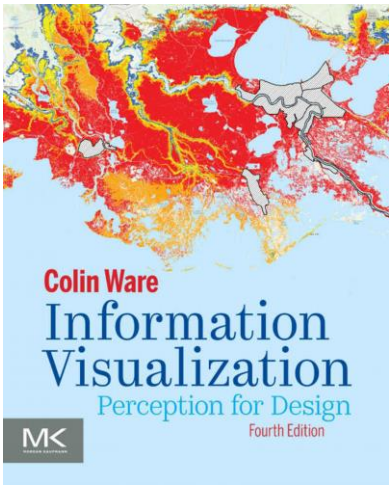



Image source

11

# Readings: Textbook – Theory/Practical

- Wilke, C. (2019). Fundamentals of data visualization : a primer on making informative and compelling figures. Sebastopol, CA, O'Reilly Media.
- Thanks Claus, for making your book available online (for free)!!

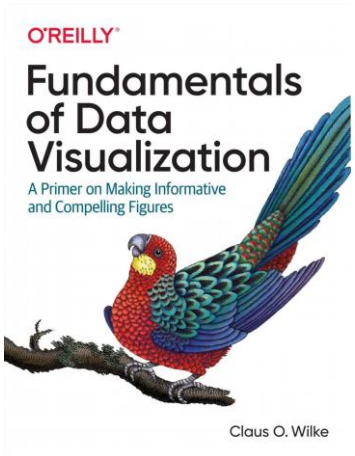



Image source

12

# Readings: Textbook – Labs

- Healy, K. (2018). Data visualization: a practical introduction. Princeton, NJ: Princeton University Press.
- Thanks Kieran, for making your book available online (for free)!!

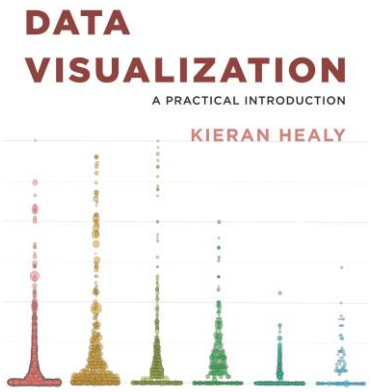



Image source

13

# Readings: Journal Articles

- This a graduate-level course, it is important that students can synthesize and discuss research articles
- Supplement the lectures, and labs
- Form the basis for the journal club discussions

Hierarchical Aggregation for Information Visualization: Overview, Techniques, and Design Guidelines

Niklas Elmqvist, *Member, IEEE*, and Jean-Daniel Fekete, *Member, IEEE*

14

# Software and Computing: Excel

- CUA students can get Office 365 for free!
- Follow the instructions at Office.com/GetOffice365
- Used for some class activities, labs, and final project
- Might want to activate the following add-ins→

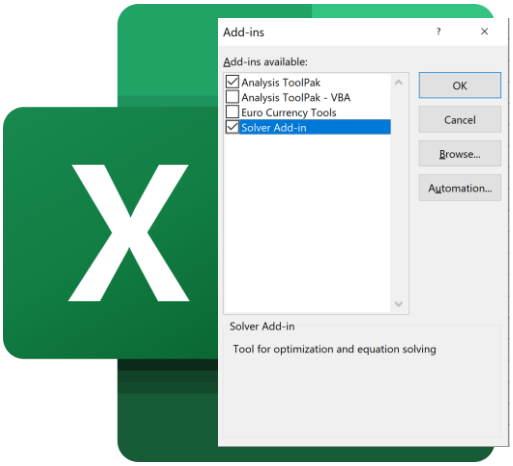



Image source

15

# Software and Computing: R and RStudio

- Install R, from CRAN, please choose a location close to you
- Install RStudio
- Install required packages
- Labs and final project are completed in R and RMarkdown

16

# Class Participation

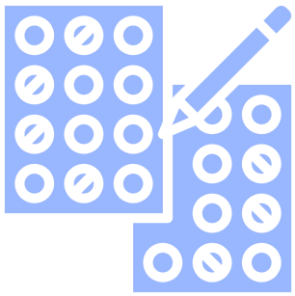
- Class participation is vital to the success in this class
- Please come to class prepared
  - Read required material
  - Ask questions in weekly forum (non-graded)



17

# Quizzes

- Designed to assess your comprehension of the material
- Focus is on readings and lectures
- Quizzes counts for 15% of your grade:
  - 3 quizzes, 5% each quiz



18

# Labs

- Designed to be practical and engaging (I hope)
- Intro labs will be more guided
- 45% of your grade:
  - 9 labs, 5% for each lab
- Graded and ungraded portions
  - Graded portions of labs should be **completed individually**
- Up to you if you want to stay for all of the "lab" portion of the class

19

# Journal Club

- Student will be pair up to co-facilitate a journal club
- 15% of your grade:
  - JC 1: (Doug will lead)
  - JC 2: Group 1 - (5%)
  - JC 3: Group 2 - (5%)
  - JC 4: Group 3 - (5%)



20

# Final Project

- Requires students to utilize concepts and tools learned in the weekly lectures, labs, and class discussions
- 25% of your grade:
  - RMD and documentation: (5%)
  - Visualization: (15%)
  - Final presentation: (5%)



21

# Final Grade

- 15 % (Quizzes)
- 45 % (Labs)
- 15 % (Journal Club)
- 25 % (Final project)

**100%**

22

# Notes on Coding

- Course was developed to be program-agnostic
- However, each semester students express a desire for more support for software
- If you have never coded, don't beat yourself up (it is hard)
- Everyone looks stuff up, which is why I don't test you on coding


Image source

23

# Notes on Coding

- You are encouraged to find solutions on your own
- Trust me, you learn (and retain more) when you solve on your own problems (or in a study group)
- Having said that, I will try to support your learning any way that I can


24

# Notes on Coding

- Everyone looks stuff up, which is why I don't test you on coding
- Be inspired by others work (we all do it), but don't copy a completed project
  - Not fair to others in the class
  - You won't learn anything


Image source

25

# Course Grades

- Total Points
  - 15 + 45 + 15 + 25 = 100 points
- Final grades will be assigned as follows:
  - A: 94-100
  - A-: 90-93.99
  - B+: 86-89.99
  - B: 82-85.99
  - B-: 78-81.99
  - C: 70-77.99
  - F: Below 70


Image source

26

# Course Site Demo

27