F18 ATCM4364 – Visualization & Information Design

2018-08-21 version

Syllabus

Instructor:
Dr. Maximilian Schich, Associate Professor in ATEC
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Time: Tuesday & Thursday 11:30am-12:45pm | **Room:** ATC 2.918

Box folders:
Assignment upload: https://utdallas.box.com/v/F18-ATCM4364-001-upload (expires Dec 31, 2018)
Material download: https://utdallas.box.com/v/F18-ATCM4364-001-download (expires Dec 31, 2018)

Course Description

Throughout the semester, students will team up to work on a visualization project. The workflow pipeline will be similar to other specializations in ATEC (animation, design, etc.). In Tuesday sessions, we will look at exciting example visualizations, discussing them like paintings in art history, which is a fun exercise. In Thursday sessions, we will hang out productively, touching base in class regarding your visualization projects.

More formally speaking, the *Visualization and Info Design* course uses an inverted classroom approach to develop both theoretical and practical visual literacy, which helps us to understand complicated and complex data sets through the design of data-based visualizations. The course frames information design and visualization as a process of reading, re-reading, visualizing, and re-visualizing data to gain optimum insight from data sets. The course does not carry any prerequisites, but will appeal particularly to students with design and/or coding experience. Of course, you can also start from scratch, particularly if you bring in a strong domain expertise in a field that lends itself to visualization (art, nature, technology, etc.). You are free to bring your own data (BYOD) or choose to work on data provided by the instructor or your peers. Students are encouraged to team up in order to mutually complement each other's expertise within projects.

Learning outcome

By the end of the *Visualization and Information Design* course, students will be familiar with principles of data visualization and information design. Students will have engaged in critical and creative aesthetics and be familiar with a prototypical visualization workflow, including material collection, preparation, analysis, visualization, presentation, and feedback among these workflow stages.

Course Schedule

Week	**Critical Aesthetics Tuesday** discussion	**Creative Aesthetics Thursdays** group work
1 Aug 20 - 24	Course Intro (why visualize? what is visualization?)	Group Formation & Leader Choice (matching complementary skill sets)
2 Aug 27 - 31	Useful Books (and other sources)	Project Proposal Planning (picking a viable area of interest)
3 Sept 03 - 07	Tools and Workflows	Project Proposal Planning (tooling up)
Sunday, Sept 9	**Portfolio workbook due** (week 1-3)	`week##-YourNetID-portfolio.pdf`
Thursdays 10:30am	**Group summary slide(s) due** (weekly from now)	`week##-GroupName-slide.pdf`
4 Sept 10 - 14	Types of Data	Data Acquisition (collecting material)
5 Sept 17 - 21	Modes of Acquiring Data	Data Acquisition (collecting material)
6 Sept 24 - 28	Preparing Data	Data Acquisition > Data Analysis
Sunday, Sept 30	**Portfolio workbook due** (week 1-6)	`week##-YourNetID-portfolio.pdf`
7 Oct 01 - 05	Basic Figure Types	Data Analysis (ordering material)
8 Oct 08 - 12	Enriching Data	Data Analysis (ordering material)
9 Oct 15 - 19	Projecting, Layout, Viz-Mapping	Data Analysis (ordering material)
Sunday, Oct 21	**Portfolio workbook due** (week 1-9)	`week##-YourNetID-portfolio.pdf`
10 Oct 22 - 26	Iterating	Data Analysis (ordering material)
11 Oct 29 - Nov 02	Curating and Combining Figures	Data Analysis > Data Visualization
12 Nov 05 - 09	Scientific Poetry	Data Visualization (constructing narrative)
Sunday, Nov 09	**Portfolio workbook due** (week 1-12)	`week##-YourNetID-portfolio.pdf`
13 Nov 12 - 16	Animating Data	Data Visualization (constructing narrative)
14 Nov 19 - 23	FALL BREAK (no class)	FALL BREAK (no class)
Wednesday, Nov 28	**Final Portfolio workbook due** (week 1-15)	`week##-YourNetID-portfolio.pdf`
15 Nov 26 - 30	How to Present	Group Presentation Preparation
Monday, Dec 03	**Group archive + presentation due**	`week16-YourGroupName-archive.zip`
16 Dec 03 - 07	Group Project Presentation (communicating)	Group Project Presentation (communicating)

These descriptions and timelines are subject to change at the discretion of the Professor.

Required Materials
There is one brief, highly visual, and condensed required reading that everybody in class should learn and know by heart at the end:

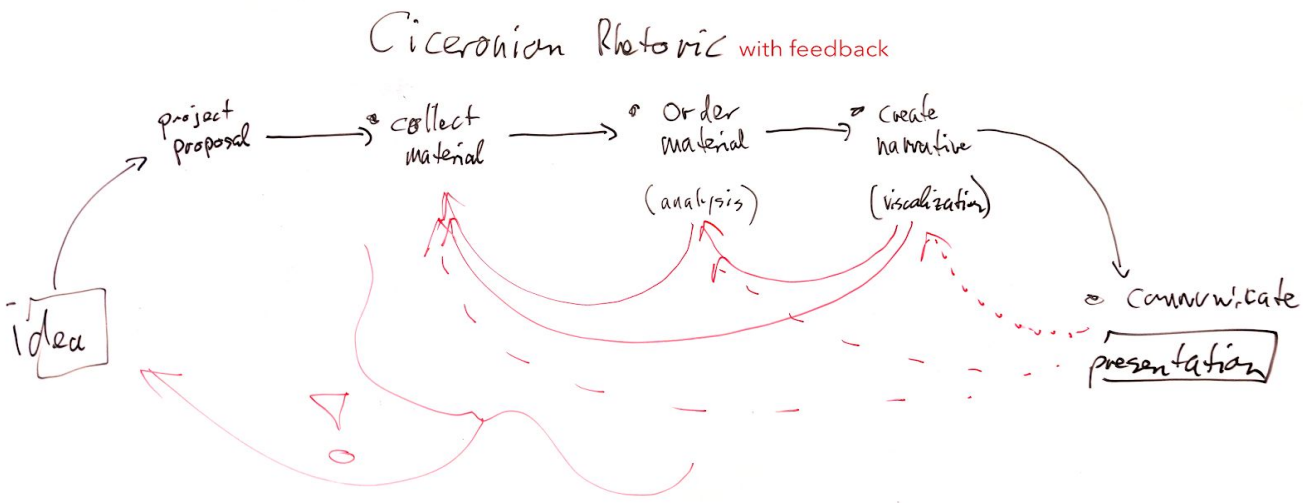
- *Jacques Bertin:* ***Brief Presentation of Graphics****. [2004] in: Semiology of Graphics. Diagrams, Networks, Maps. (ESRI Press, 2010). pp. 418-434*

As a textbook, or better "good friend on your desk", I recommend a book that officially caters to advanced undergrad and grad students, yet is also a good investment for undergrad students, as it functions as a great long-term reference into which one can grow:

- *Tamara Munzner:* ***Visualization Analysis and Design.*** *(CRC Press, 2014).*

Further recommended readings, serving specific needs, will be suggested in class.

Workflow
The diagram below is an ***ideal figure*** of project workflow, as outlined on the whiteboard and discussed in the first session. We will ***iterate*** this picture over time, based on project experience. We expect the ***evidence-based figure*** looking different for different group projects. A collage of all resulting workflow diagrams, bringing together all group projects, would provide an interesting comparison to the ideal figure at the end of the semester.



For those interested, there is a multiplicity of theories behind this figure:

- *Marcus Tullius Cicero:* ***De Oratore.*** *cf. https://en.wikipedia.org/wiki/De_Oratore#Fundamentals_of_rhetoric*
- *Ben Fry:* ***Visualizing data.*** *(O'Reilly, 2007) p. 15 fig. 1-12*
- *Miriah Meyer:* ***Designing Visualizations For Biological Data.*** *Leonardo 46,3 (2013) 270-271*
- *Jeroen Janssens:* ***Data Science at the Command Line.*** *(O'Reilly, 2015) p. 2 s.v. "Data Science is OSEMN"*
- *Maximilian Schich:* ***The Hermeneutic Hypercycle.*** *in: J. Brockmann: Know This [...] (Harper Perennial, 2017) pp. 561-563. Open access: http://edge.org/response-detail/26784*

Assignments
ATCM 4364 assignments are designed to introduce you to a complete and versatile workflow sequence of critical and creative aesthetics, data visualization, and information design. Assignments will be discussed in class. The instructor will be available right after class to discuss individual issues. The following course-specific policies supplement the standard UT Dallas policies that you must know and follow (available at *http://go.utdallas.edu/syllabus-policies*).

Teaming Up
At the begin of the semester we will team up in groups. Between the first and the second session, I will ask you to share your enthusiasm in "three three word phrases" and estimate your own skills, from 0 (none) to 5 (pro) in number of categories. This will allow us to form groups featuring a common interest in terms of topic, yet complemenary in skills, which in turn should make group work more viable and successful. The categories used to self-estimate your skill include the ATEC undergrad foundations: Computer Imaging, Design Principles, and Computer Science for non-majors. In addition, for fun and to provide perspective, a second set of categories will be taken from Data Science practice in industry, including Data Visualization, Machine Learning, Mathematics, Statistics, Computer Science, Communication, and Domain Expertise (the latter ideally specified in your three three-word-phrases above). The assignment will feed into our first visualization exercise, demonstrated by myself in class. You will receive an email, which will allow you to complete the assignment in a simple reply within ten minutes.

Group Project & Presentation
Once we have teamed up in groups, you will collaborate with your group throughout the semester towards a common goal in a visualization project. Group work inside and outside of the classroom will aim to follow the workflow stages as outlined in the first session, and as indicated in the syllabus under Workflow and within the Course Schedule. We will touch base every Thursday to discuss group progress, to exchange hints, and to plan ahead. The group projects will culminate in a final presentation at the end of the semester.

A caveat:
As data visualization is subject to uncertainties, you won't be able to stick with the ideal workflow timeline at all times, sometimes being faster, sometimes slower. To ensure success, I recommend each group to think two to three weeks ahead at all times, while keeping the overall target deadline at the end of the semester in mind. Each group should aim to stick with the timeline as far as possible, avoiding to stray from the workflow milestones more than two weeks.

There are three deliverables for the group project:

1. Each week the group will submit a single summary slide that summarizes the weekly progress. This summary slide should be a single-page PDF, letter-size, landscape-orientation, with no other restrictions. To facilitate discussion, you can add additional slides and/or material for discussion in class in another single but separate PDF-file or ZIP-file. The material can be anything, but keep in mind that our weekly discussion time is brief, so if you intend to include large files in a zip (such as images, spreadsheets, or code that takes time to execute), better take and include screenshots that we can discuss more qickly. The filename convention for the weekly submission is `week##-YourGroupName-slide.pdf` (for the single page slide), and `week##-YourGroupName-material.zip` or `.pdf` (for your optional material).

2. At the end of the semester each group will present their project in a 20 minute time slot. This can be any style. Yet, if you demo an interactive website or similar, you should include a summary record, such as a PDF-slide-set or a five-minute-video, which one can look at after the presentation (or more importantly after the technology as used becomes obsolete). The filename convention for the group presentation is `week16-YourGroupName-presentation.zip` or `.pdf`.

3. At the end of the semester, in addition, each group wraps up their project in a project archive folder, which will allow each team member or a third party to pick up on the project later on. I recommend this archive to include the following subfolders: "base" including datasets as used; "aspects" including individual plots or maps etc.; "products" including combinations of aspects in presentation drafts etc.; "bibliography" including essential/useful sources, and "portfolios" including your final individual portfolios (see below). The filename convention for the Group archive is `week16-YourGroupName-archive.zip` (or `.pdf` if the result is a static 20-minute presentation).

Good archive housekeeping:
It makes sense to identify all subfolders and files in the final archive with the day of production, a version number if more than one file has been produced in a day, the NetID(s) of the file authors, and the aspect name. Particularly within the subfolders "aspects" and "products" the following file convention is useful: `YYYYMMDDv##_NetID1-NetID2_AspectName.xyz`, i.e. Japanese date, version, underscore, NetID, minus, NetID (etc.), underscore, aspectname, dot file format.

Individual Portfolios

To document your own thoughts and contributions within your group, please collect a personal portfolio. The final target size of the final submitted portfolio should not extend 15 pages, i.e. a single page per week on average. The portfolio should be a PDF, letter-size, portrait-orientation, with no other restrictions. To make this easier, think of this portfolio as a summary version of your lab notebook or journal. If you need inspiration, think of Bertin's "Brief Presentation of Graphics" in comparison to his full "Semiology of Graphics" book. It makes sense to include your individual success strategies, your acts of collaboration, failures and their mitigation, and to explain your individual workflow. The filename convention for the individual portfolio is `week##-YourNetID-portfolio.pdf`

Assignment submission:
To hand in any assignment, upload the respective file to our UTD Box upload folder no later than midnight on the evening before class (unless specified otherwise). If you don't follow the file-name convention for submission files you will loose credit for that week. File and folder names witinin zip files are subject to common sense. Yet, each zip file should unzip to a single folder named equivalent to the zip file itself for obvious reasons. You can achieve this by naming the folder first, then zip for submission. => https://utdallas.box.com/v/F18-ATCM4364-001-upload

Grading Criteria:
All work should conform to professional and ethical standards, so “proofread” and edit work that you submit in this class for clarity, mechanics, and style issues. This applies to graphics/visuals or any other chosen genre of expression, much like text. Professionalism also means that you use appropriate source citations wherever and whenever necessary. You should not submit any work for this course that you developed for another course without written permission from both course instructors. While you may explore topics across courses, the work you submit for ATCM 4364 should be substantially different from the work that you submit in any other course. All individual grades are scored out of 100 points. Because the grades are weighted, a simple average will not determine your grade.

Relative Shares Contributing to Your Grade:
30% Participation & Attendance + 35% Weekly Portfolio Assignment + 35% Group Project Presentation = TOTAL 100%

Grade Rubric for Assignments:
To make a C or less, simply do not follow the assignment instructions, refuse to collaborate with your group, disregard filename and file format conventions, and/or turn it in after the deadline. To make a B, follow the assignment instructions, avoid “spelling and grammar errors” in writing and graphics, follow filename and file format conventions, turn it in on time, and include academic references where necessary. To make an A, aim for excellence in terms of presentation and content, including references and graphical layout.

Participation & Attendance:
More than just attendance, this grade reflects how you share your ideas, participate in classwork, engage your classmates, and behave with respect toward them. Your comments and insights contribute to the class’ success, so you must attend class prepared to discuss material as a public, interactive process. Everyone benefits when you engage alternative perspectives, challenge interpretations, and invite constructive arguments as long as you do so respectfully.

This grade explicitly includes civility and professionalism in all course communication and behavior, such as contributing to conversations, respecting others’ opinions, working together in a spirit of cooperation, and actively listening to those who are speaking. Some of the ways you can demonstrate your skills in this area include (but certainly are not limited to): Keeping the class in the foreground of your attention; Showing respect to your peers and to the instructor in your listening and communicating behaviors; Participating actively in class rather than simply waiting to be called on; Adding value with your contributions to discussion, such as connecting disparate ideas, bringing topical information to the table, and asking insightful questions; Taking responsibility for the consequences of your choices and actions; Demonstrating a strong work ethic by engaging all ungraded work (such as completing assigned readings, minor homework, and in-class exercises) with a mindfulness and timeliness to reflect a professional approach to the class.

Late Work:
If a personal situation arises during the semester that may affect your classroom performance, please talk to me sooner rather than later. In other words, be proactive. If you wait until the end of the semester, I cannot help you. I can work with you more easily if you speak to me when the situation arises. I can’t help you if I don’t know you need help. You can have make-up privileges for university-specified circumstances, including religious holy days and university-sponsored activities. If you must miss class or deadlines for such reasons, you must make arrangements with me in advance.

Digital Devices:
You may use laptops, tablets, cell phones, and other digital devices so long as you use them responsibly and respectfully and particularly if you use them to enhance the class-experience. If your digital device disturbs other students or interferes with your ability to participate meaningfully in class activities, you may be asked to remove the distraction and/or leave class, thus losing credit for any of the day’s activities. Please silence device notification settings before class begins and refrain from accepting calls in class. However, if I see you are texting or emailing with a friend, watching a movie, or playing video poker, I will not be happy and may ask you to leave from that day’s class.