2022 IDEAS FSS-Vis Syllabus

Zoom link

Instructor : Aaron Geller : a-geller@northwestern.edu

Materials available on Aaron's GitHub site : https://github.com/ageller/IDEAS_FSS-Vis

Course Schedule Summary :

Part 1 (April 4 - 12) : Instructor led learning (required attendance), Mondays and Tuesdays
- 10am – 12pm : lecture / discussion / hands-on tutorials
- 1pm – 4:30pm : independent work and (short) "show and tell"

Part 2 (April 18 – 22) : Independent projects, Monday – Friday
- 10am – 12pm : Zoom check-ins, required attendance on April 18, 19
- 10am – 4:30pm : open Zoom, Aaron will be there by appointment only April 20-22

April 25 or 26 (TBD): **Final Demos** = 10 minutes per student, including questions

Part 1 Schedule Detail :

Monday April. 4 : Introduction, Creating an effective graph, & matplotlib
- 10:00 – 10:15 : Course introduction
- 10:15 – 11:15 : Introduction to visualization design + How to create an effective graph
- 11:15 – 12:00 : Hands-on python+matplotlib
- 12:00 – 1:00 : Break
- 1:00 – 2:00 : Hands-on python+matplotlib, continued
- 2:00 – 3:00 : Student projects with python+matplotlib
- 3:00 – 4:30 : Students "show and tell", and discussion

Tuesday April. 5 : 2-D interactive visualizations with Bokeh and Plotly
- 10:00 – 12:00 : Introduction to and hands-on with Bokeh and Plotly
- 12:00 – 1:00 : Break
- 1:00 – 2:00 : hands-on Plotly continued
- 2:00 – 3:00 : Student projects with Bokeh and/or Plotly
- 3:00 – 4:30 : Students "show and tell", and discussion

Monday April 11 : 2-D interactive visualizations with D3.js
- 10:00 – 12:00 : Introduction to web and D3
- 12:00 – 1:00 : Break
- 1:00 – 3:00 : Student projects with D3
- 3:00 – 4:30 : Students "show and tell", and discussion

Tuesday April 12 : 3-D Interactive visualizations with ParaView and WebGL (using three.js)
- 10:00 – 11:00 : Introduction to ParaView
- 11:00 – 12:00 : Introduction to WebGL and three.js
- 12:00 – 1:00 : Break
- 1:00 – 3:00 : Student projects with ParaView or WebGL
- 3:00 – 4:00 : Students "show and tell", and discussion
- 4:00 – 4:30 : Discuss expectations of final project

Optional activity for independent exploration : Survey of other useful visualization software
- There are walkthroughs and/or notebooks on our GitHub repo for many of these. Check them out!
  - *Volumetric Data* : VisIt
  - *Web-facing Tools* : x3dom, shiny, datawrapper
  - *General Interactives* : OpenGL, Processing, Unity
  - *Artist Tools*: Photoshop, Illustrator, Maya, Blender, ffmpeg, Image Magick
  - *Python Tools* : Seaborn , Glue
  - *Mapping* : GMT, NASA WorldWind, cartopy, basemap
  - *R* : ggplot2, Shiny
  - *Other utilities:* WebPlotDigitizer, Fiji

Part 2 Schedule Detail (required hours in red):

Monday April. 18 : Student project proposals

- 10:00 – 12:00 : Propose projects to Aaron / work on project
- 12:00 – 1:00 : Break
- 1:00 – 3:00 : Students “show and tell”, and discussion
- 3:00 – 4:30 : Students work independently, AG available for questions

Tuesday April. 19 : Continue working on visualization projects

- 10:00 – 12:00 : AG meets 1-on-1 with students to check in; students work independently
- 1:00 – 4:30 : Students work independently, AG available for questions

April 20 – 22 : Continue working on visualization projects with scheduled check ins

- 10:00 – 4:30 : Students work independently, AG available for questions
- NOTE: each student must schedule at least one check in with AG during over these days.

Final Demo due date: April 25

Monday April 25 by 10am : Send final products to AG (1-page description + picture/video/website + all files)

Final Presentations will be either April 25 or 26 (TBD), on Zoom, 5 to 7 minutes + 3 minutes for questions, per student