2020 IDEAS FSS-Vis Syllabus

Sept. 3 – 18, Zoom and Slack

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 (Sept. 3 – 10) : Instructor led learning (required attendance)
- 10am – 12pm : lecture / discussion / hands-on tutorials
- 1pm – 4:30pm : independent work and (short) "show and tell"

Part 2 (Sept. 11 – 17) : Independent projects
- 10am – 12pm : Zoom check-ins, required attendance
- 1pm – 4:30pm : open Zoom, optional attendance on Sept. 14 – 17

Sept. 18, 3pm – 5pm : **Final Demos** = 10 minutes per student, including questions

Part 1 Schedule Detail :

Thursday Sept. 3 : 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 (Adam Miller)
- 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

Friday Sept. 4 : 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 – 3:00 : Student projects with Bokeh or Plotly
- 3:00 – 4:30 : Students "show and tell", and discussion

Tuesday Sept. 8 : 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

Wednesday Sept. 9 : 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 – 4:30 : Students "show and tell", and discussion

Thursday Sept. 10 : Survey of other useful visualization software
- 10:00 – 12:00 : 15 minute hands-on demos of many of the following
  - *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
  - *Other utilities:* WebPlotDigitizer, Fiji
- 1:00 – 2:30 : Student exploration of these tools
- 2:30 – 4:00 : Students "show and tell", and discussion
- 4:00 – 4:30 : Discuss expectations of final project

Friday Sept. 11 : Student project proposals

- 10:00 – 11:00 : Free time to brainstorm and explore
- 11:00 – 12:00 : Propose projects to Aaron / work on project
- 12:00 – 1:00 : Break
- 1:00 – 3:00 : Propose projects to Aaron / work on project
- 3:00 – 4:30 : Students “show and tell”, and discussion

Part 2 Schedule Detail (required hours in red):

Monday Sept. 14 : Continue working on visualization projects

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

Tuesday Sept. 15 : 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

Wednesday Sept. 16 : Half of visualization project must be completed before noon

- 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

Thursday Sept. 17 : Final day before demos

- 10:00 – 4:30 : AG meets 1-on-1 with students to discuss demos; students work independently (AG has a meeting from 1:50-3pm)

Friday Sept. 18 : Final Demos

- 1:00 : Final Products due to AG (1-page description + picture/video/website + all files)
- 2:00 – 3:30 : Final Demos on Zoom: 5 to 7 minutes + 3 minutes for questions, per student