Introduction to Graphics

Elements of Graphics
CS324e
Introductions

❖ I am Dr. Sarah Abraham
❖ Email: theshark@cs.utexas.edu
❖ Office hours: TTh 11:00-1:00
❖ When sending e-mail please include your section number so I can more easily location your information
❖ You may also contact me via Canvas or Discord DM as necessary
TAs

- TAs have not been assigned to sections yet, but I’ll have assignments posted before Friday’s class and office hours will be posted shortly after.
What is Graphics?
Graphics and Visualization

- Computer graphics creates imagery through computing
  - Simulation
  - Modeling
  - Games
  - Artist tools
- Computer Visualization conveys messages or information through computer graphics
  - Medical
  - Sociological
  - Biological
  - Physical
Big Hero 6 (Disney)

Combustion Engine (Sandia)
Topics Covered

- Processing language
- Graphics programming
- Image manipulation
- Data visualization
- Object-oriented programming
- Animation
- Simulation
- Interactivity
- WebGL and shaders
Elements of Graphics Class Format

- In this class, we will focus on group exploration and discussion rather than lecture.
- Thus the day’s format will be:
  - 10 minute presentation of “Hands-on” student work
  - 20-30 minutes of new class material
  - 10-20 minutes of “Hands-on” work (collaboration encouraged)
Class Expectations

❖ Project-based work
  ❖ Team projects and reports
❖ Engaged and helpful attitude
  ❖ Weekly Hands-on activities
  ❖ Ask and answer questions on Piazza/Discord
❖ Academic honesty
❖ Positive teamwork and interactions
❖ Preparedness for class
❖ Ability to read syllabus and schedule on your own
Hands-on Presentations

❖ Each day will start with a code review of one student’s Hands-on activity
  ❖ I will present the work from my laptop, so the class and I can provide personal feedback!
❖ Please volunteer and show off your work!
  ❖ Submit via Canvas the night before
  ❖ Contact me, so I can download the material in advance
  ❖ Share your code with other students!
❖ You may discuss Hands-on questions in both Piazza and Discord
Instapoll Quizzes

- Attendance will be taken via Instapoll at varying places during the lecture starting the 3rd week of class
- You will have 1-2 minutes to answer
- The question will cover something discussed earlier in the lecture
- Grade is purely completion
- Have your laptop or phone ready so you can answer quickly
Class Attendance

❖ Attendance in this class is **mandatory**
❖ You have 5 “no questions asked” days for absences
  ❖ Can be applied in case of emergencies/unexpected situations
  ❖ These do not apply to “mandatory” days such as final presentations
❖ Each additional day of an unexcused absence will lower your grade by one letter
  ❖ Four of these will result in you failing the course
Attendance Makeup Assignments

❖ You can make up these unexcused absences by writing a 500 word essay discussing an interesting topic covered in the class you missed

❖ Paper should have your name, date of class missed and be double-spaced

❖ Notify me by e-mail that you are submitting this assignment, so I am able to grade it
Processing

- Java-based language for visualization
- Designed for non-programmers
- All documentation can be found at https://processing.org/
- Recommended reading: *Processing* by Casey Reas and Ben Fry
Processing Examples

❖ Wayfarer (http://benhem.com/games/wayfarer/)

❖ Avena+ Test Bed (http://benedikt-gross.de/log/2013/06/avena-test-bed_agricultural-printing-and-altered-landscapes/)

❖ City Symphonies (http://markmckeague.com/work/city-symphonies/)
Processing Languages

- Processing.py allows for Python-style syntax within the Processing language
- p5.js is the Javascript version, which works well with HTML5
- Class examples will be done using Java-based Processing
- Projects should be in Java Processing
- Note: we will use Javascript when working with WebGL
Processing “Hello World”
In-Class Exercise

- Install Processing on your laptop
  - I am using **Processing 3** and all in-class examples will be in Processing 3 rather than Processing 4
- Create `void setup()` and `void draw()` functions
  - Look on the Processing website to see some of the available calls to use within these functions
- What is the difference between `setup()` and `draw()`?
Next Class

❖ Online meet and greet!
❖ Chance to meet your classmates despite starting the semester remote
❖ We will meet in the class Discord voice channel
❖ Please have three pictures ready to share that capture some part of you
❖ Can be from media you like, a place you’ve visited/your hometown, a picture of yourself, a picture of a pet, your own artwork etc