Introduction to Graphics

Elements of Graphics
CS324e
Spring 2019
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 student presentation of previous work
  ❖ 20-30 minutes of class material
  ❖ Periodic quizzes to test understanding
  ❖ 10-20 minutes of in-class work (groups encouraged)
Class Expectations

❖ Project-based work
  ❖ Team projects and reports
❖ Engaged and helpful attitude
  ❖ Mandatory attendance
  ❖ Ask and answer questions on Piazza
❖ Academic honesty
❖ Positive teamwork and interactions
❖ Preparedness for presenting your work in class
❖ Ability to read syllabus and schedule on your own
In-Class Presentations and Quizzes

❖ Attendance and discussion will be done using iClicker and in-class presentations
  ❖ Be prepared/on time to present!
  ❖ I will pick a student at random to discuss what they worked on
    ❖ You will be notified the night before on Piazza, so let me know if you need to use my laptop/connecting cables, etc
    ❖ You may be picked multiple times!
❖ In-class quiz grades are participation (wrong answers are not penalized)
  ❖ Checks individual attendance
  ❖ Checks understanding of material
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
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

- 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/)
- Wayfarer (http://benhem.com/games/wayfarer/)
- Non-linear Code (http://dextro.org/default_h.html)
Processing Languages

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

❖ Install Processing on your laptop
❖ 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()`?