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Computer Science Department

Introduction to Graphics

Elements of Graphics
CS324e

Introductions

- I am Dr. Sarah Abraham
  - Email: theshark@cs.utexas.edu
  - Office hours: TTh 1-3pm
- When sending e-mail please include your **section number** so I can more easily locate your information
- You may also contact me via Canvas as necessary, but email is preferred

TAs

- TAs
  - Chen-Chun Hsu
  - Kayla Han
  - Angela Walters
- Office Hours will be posted soon!

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 or a review quiz
  - 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 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 you 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 Discord

Instapoll Quizzes

- Attendance will be taken via Instapoll at varying points during the lecture starting the 3rd week of class
- You will have 1-2 minutes to answer
- There will be an in-class code to deter cheating
- The question will cover something discussed earlier in the lecture
  - Grade is completion

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
  - Unless…

Attendance Makeup Assignments

- You can make up 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** that you are submitting this assignment, so I am able to grade it in a timely manner
  - Must be submitted within a week of the absence outside of an ongoing student emergency (please go through Student Emergency Services if something like this comes up)
  - Submit through the "Make up Essay" assignment on Canvas (repeated submissions are okay)

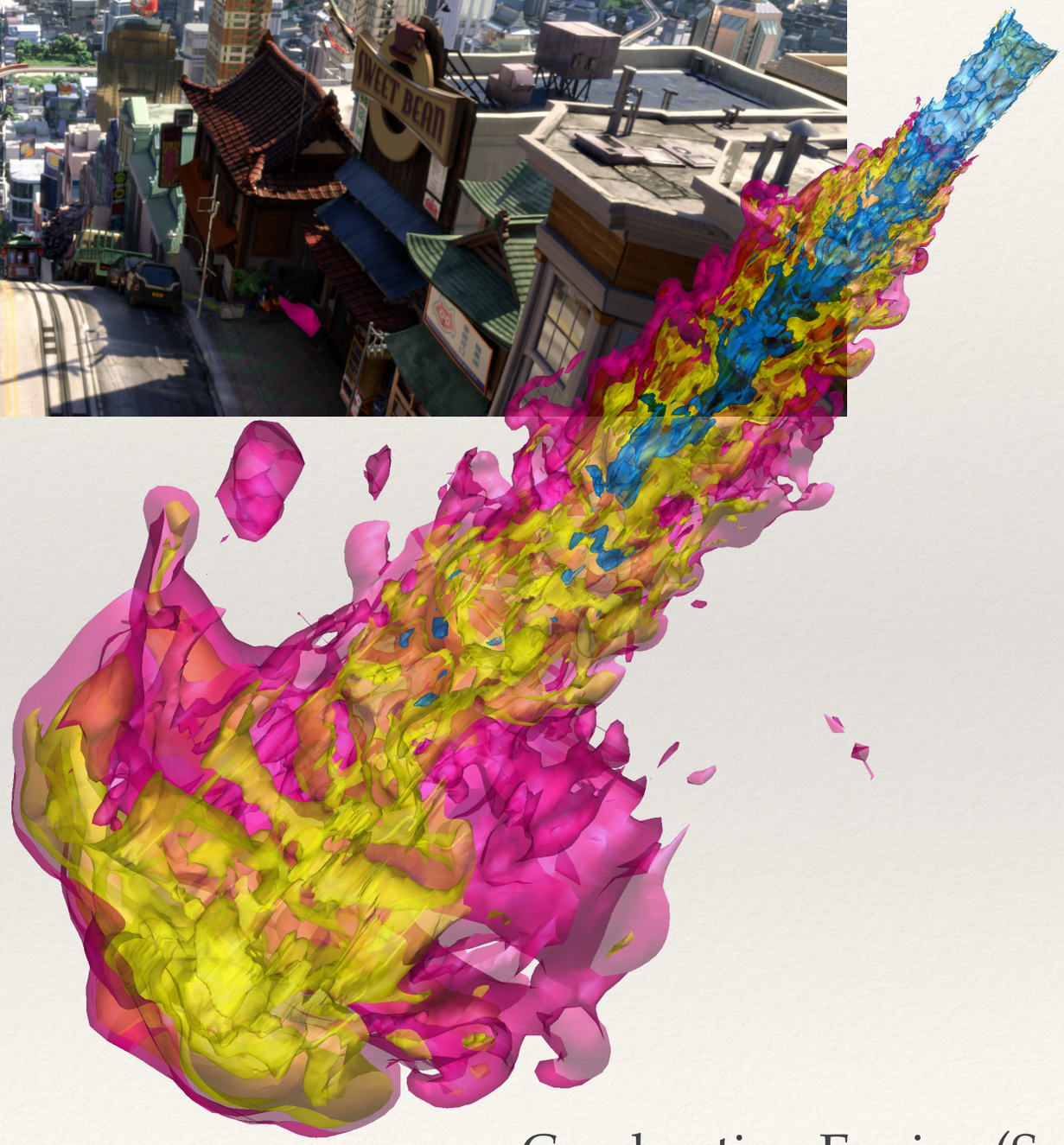
Questions about the class policies?

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

- Games (https://itch.io/games/made-with-processing)
- 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**
  - **I will prefer Processing 3 over Processing 4**
- Note: we will use Javascript when working with WebGL/ ThreeJS later in the class

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 unless Processing 4 is unavoidable
- 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()`?