Course Intro:
Welcome to Technical Animation!

15-464/15-664 Technical Animation, Spring 2017
Introductions
Some things I work on

Topics
Grand Challenges in Technical Animation
Things to think about!
Uncanny Valley

Masahiro Mori, 1970
Parallelism: A Modern GPU may process tens of thousands of pieces of data concurrently

**NVIDIA GTX 480**

- 32 ALUs
- 48 interleaved contexts
- 15 cores

To keep this graphics card completely busy, we need to be processing **23,000** pieces of data concurrently

potentially 720 separate instruction streams

slide excerpted from Kayvon Fatahalian  CMU course 15-418
Course Organization
15-464 / 15-664 Administrative Information for Spring 2017

Time: Monday and Wednesday from noon-1:20pm
Place: GHC 4211

Online Resources

The class web page is at
http://graphics.cs.cmu.edu/nsp/course/15464-s17/www/

This is the primary online source for information about the course, including assignments, lecture notes, and administrative details.

Prerequisite

- 15-462: Computer Graphics or equivalent

Recommended Text


Grading Information

Grading for the class will be as follows:

- Programming Assignments:
  - Mini Project 1 - Traditional Anim (15%)
  - Mini Project 2 - Simulation (15%)
- Final Project 40%
- In-class paper presentation 10%
- Web page / blog 10%
- Class Participation 10%
Assignment 0

• Email me 5 paper choices (nsp@cs.cmu.edu)

• Due Tuesday, Jan 24th

• Guidelines:
  • published in 2016 (with some exceptions!)
  • relevant to Technical Animation

• You will present one of these papers in class

• First come, first served, so get me your choices early!

• Detailed guidelines will be posted on piazza later today
Monday, Jan 23

• We are going to dive in head first!

• Meet here for short class: prep for Eftychios Sifakis seminar

• Adjourn to attend the seminar at 1pm, NSH 1507
Digital humans, virtual surgery and fast fluids; do they have more in common than their hunger for performance?

Abstract: Physics-based modeling research in graphics has been consistently conscious of advances in modern parallel hardware, leveraging new performance capabilities to improve the scope and scale of simulation techniques. An exciting consequence of such developments is that a number of performance-hungry emerging applications, including computer-aided healthcare and medical training, can now hope to be accommodated in interactive systems. Nevertheless, while large-scale simulation for production-grade visual effects always had the option of clustering compute resources to keep up with growing needs, realtime or near-interactive applications face a more complex set of challenges. In fact, extracting competitive levels of efficiency out of modern parallel platforms is more often than not the result of cross-cutting interventions across the spectrum of theory, modeling, numerics and software engineering.

In this talk I will present a number of examples, mostly drawn from biomechanical modeling, virtual surgery and anatomical simulation tasks, where fresh perspectives on discretization, geometrical modeling, data-parallel programming or even the formulation of the governing PDEs for a physical system were instrumental in boosting parallel efficiency. Finally, I will discuss important lessons learned from simulations of human anatomy, and how those pertain to the design of solvers for computational physics at large, and particularly how they can boost the scale and efficiency of highly detailed fluid dynamics simulations.