This Course

• This course covers basic data structures and algorithms in Computer Science.

• Knowledge and understanding of these data structures and algorithms is fundamental to your success in Computer Science.

• You will find there is much more to Computer Science than “just programming”; the sooner you learn to program well and understand the fundamentals, the sooner you can solve fascinating problems!
Who am I?

• Daniel G. Aliaga

http://www.cs.purdue.edu/~aliaga and aliaga@cs.purdue.edu
Associate Professor of CS doing Graphics
Doctorate in Graphics
Master’s in Graphics
Bachelors in Graphics
High School Degree doing graphics/robots/science
1980 (TRS80 Model I)

Then: http://www.youtube.com/watch?v=3yuqdC8Id48)
http://thinkingscifi.files.wordpress.com/2012/12/starwars-graphics.png

Now: http://www.youtube.com/watch?v=QAEkuVgt6Aw
http://www.youtube.com/watch?v=QbzE8jOO7_0

• CGVLAB

http://www.cs.purdue.edu/cgvlab
Spatially Augmented Reality

- Renaissance angel: 16\textsuperscript{th} century (Giovanni della Robbia)
Spatially Augmented Reality

- Renaissance angel: 16\textsuperscript{th} century (Giovanni della Robbia)

\begin{itemize}
  \item photo of original object
  \item image of synthetic restoration
  \item photo of visually compensated object
\end{itemize}
3D Urban Design and Planning
Our objective is *not* to precisely recreate a current city, but to enable urban planning scenarios with a similar degree of visual realism.
3D Design and Manufacturing

Does designed = physical object?

Designed 3D Model

Designed Signature

Acquired Fragment

Physical Object

Physical Signature
CS334
Fundamentals of Computer Graphics

• Interested in computer graphics, virtual reality, architecture, games? Does modeling objects interest you? Do you like rendering photorealistic imagery? Is doing animations fun to you? All this is part of computer graphics.

• https://www.cs.purdue.edu/homes/aliaga/cs334-17fall/index.htm
Excerpt from recent final projects using a sandbox...
CS251 Details

- **Course website:**

- **Instructor:**
  - Daniel G. Aliaga (aliaga@cs.purdue.edu)
  - Office hours: LWSN 3177, by appointment

- **TAs:**
  - Noah B. Field (fieldn@purdue.edu)
  - Negin Karisani (nkarisan@purdue.edu)
  - Hafiz Kamran Khalil (khalilh@purdue.edu)
  - Seunghoon Lee (lee2856@purdue.edu)
  - Christopher K. May (may5@purdue.edu)
  - Meher Chaitanya Pindiprolu (mpindipr@purdue.edu)
  - Rajkumar Pujari (rpujari@purdue.edu)
  - K M A Solaiman (ksolaima@purdue.edu)
  - Meng-lin Wu (wu223@purdue.edu)
  - Office and Office hours: LWSN B116; TBD

- **Lecture:**
  - T/Th, 4:30-5:45pm, MATH 175

- **PSOs:**
  - many of them
CS251 Workload

• Lectures
  – 2 times a week (75 minutes each)
• PSOs
  – Once a week
• Work Load
  – 1 final: 2 hours
  – 1 midterm: 1 hour
  – 5 homeworks: 30-60 minutes
  – 5 programming projects: “1-4 weeks”
Lecture Schedule 1 of 2

- Week 1: Introduction and Algorithm Analysis
- Week 2: Analysis, Stacks, Queues
- Week 3-4: Lists, Trees, Heaps, Priority Queues, Hashing, Sorting Basics
- Week 5-6: Searching and Sorting
- Week 7-8: Graphs
- Week 9: Midterm
Lecture Schedule 2 of 2

• Week 10: Spring Break
• Week 11: Graphs
• Week 12-14: Strings
• Week 15: TBA
• Week 16: Review
• Final Exam
Homeworks

• 1: Algorithm Analysis (1 week)
• 2: Hashing and Basic Sorting (1 week)
• 3: Graphs (3 weeks including Spring Break)
• 4: Strings I (1 week)
• 5: Strings II (1 week)
Programming Projects

• 1: Hello World (1 week)
• 2: Stacks and Queues (2 weeks)
• 3: Hashing/Heaps (3 weeks)
• 4: Searching/Sorting (4 weeks, including SB)
• 5: Graphs (4 weeks)
Getting Started!

• Lectures this week
  – C++
  – Algorithm Analysis

• PSOs
  – This week: none
  – Next week:
    • C++, programming environment, turnin

• Assignments
  – First homework goes out Friday
  – First programming project goes out Monday
Questions?