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](http://www.cs.purdue.edu/~aliaga) and [aliaga@cs.purdue.edu](mailto: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](http://www.cs.purdue.edu/~aliaga))

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

Now: [http://www.youtube.com/watch?v=QAEkuVgt6Aw](http://www.youtube.com/watch?v=QAEkuVgt6Aw)
  [http://www.youtube.com/watch?v=QbzE8jOO7_0](http://www.youtube.com/watch?v=QbzE8jOO7_0)

• CGVLAB
  
Spatially Augmented Reality

- Renaissance angel: 16th century (Giovanni della Robbia)

front view

side view
Spatially Augmented Reality

- Renaissance angel: 16th century (Giovanni della Robbia)

**photo** of original object  **image** of synthetic restoration  **photo** of visually compensated object
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?

Desired 3D Model

Acquired Fragment

Physical Object

Designed Signature

Physical Signature
• 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/cs334-15fall/index.htm
CS334
Fundamentals of Computer Graphics

• Excerpt from recent final projects using a sandbox...
CS251 Details

- Course website:
  - http://www.cs.purdue.edu/homes/aliaga/cs251-16
- Instructor:
  - Daniel G. Aliaga (aliaga@cs.purdue.edu)
  - Office hours: LWSN 3177, by appointment
- TAs:
  - Andres Bejarano; abejara@purdue.edu
  - Debajyoti Das; das48@purdue.edu
  - Benjamin Harsha; bharsha@purdue.edu
  - Jihwan Lee; lee1293@purdue.edu
  - Chris May; may5@purdue.edu
  - Baharak Saberidokht; bsaberid@purdue.edu
  - Office hours: LWSN B116; Chris May (Mon 1-3pm), Jihwan Lee (Wed 3:15-5:15pm),
    Debajyoti Das (Fri 10:30-11:30am), Baharak Saberidokht (Fri 12:30-1:30pm),
    Andres Bejarano (by appt), Benjamin Harsha (by appt).
- Lecture:
  - T/Th, 4:30-5:45pm, Lynn Hall 1136
- PSOs:
  - 8 of them, one TA per session
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?