Announcements

- Days until Final Project Due: 0
  - Due today, Monday, March 16
  - Can turn in game until 5pm
  - Need to submit a game manual
    - Simple, 1 page is probably fine
    - Describe how to win game
    - Describe controls
    - Give name of game, name of team, team members
- Help session
  - Monday, 3:30-4:40pm, Physical Sciences 140
  - Help on project, final exam q&a
Announcements

• CS 80K game judging
  ► The best student games created this year in CS 80K
  ► Presented today (Monday) at 2pm
  ► Media Theater
  ► You are welcome to attend
  ► Usually a lot of fun

• Game Design Studio II game presentations
  ► 5-7pm, Earth and Marine Sciences B206
  ► See current status of games being developed by the seniors in the Game Design Studio sequence
Final Exam

- The **final** exam is this Thursday
  - Will include all material since midterm
  - Will include selected topics from first half of class (see following slides)
  - Will depend on knowledge from first half of the class
- Will give list of potential questions on following slides
- Mostly short answer questions
- Exam starts 9am, Thursday, Nat. Sci. Annex 101
  - This classroom
  - Exam will take 1 hour. Second hour is game demonstrations.
  - Mandatory attendance at game demonstrations
  - Bring your laptop (if you have one) with your game to demonstrate
  - If you do not have a laptop, either arrange with a friend to demo on their machine, or just observe other student games.
Potential Exam Topics

• As Univ. of California students, you are expected to be able to assess complex material and make judgments concerning its relative importance.

• That said, it can be helpful to have some input from the Professor to help focus studying activity.

• The following are questions/topics that are likely, but not guaranteed to appear on the exam.

• Anything covered in class or in the assigned readings may appear, even if not explicitly mentioned today.
Potential Exam Questions

• Know the Singleton and Chain of Responsibility design patterns
  ► Understand how Singleton is implemented
  ► Understand difference between Chain of Responsibility and Decorator patterns
    • Difference in UML, as well as in the chains of object instances created

• What is collision detection?
  ► If two objects intersect

• What is collision resolution?
  ► When objects contact, where they contact
Potential Exam Questions

- What are the two approaches for scaling collision detection?
  - Reduce # of collision pairs
  - Make collision checks inexpensive
- What is the problem with naïve collision checking?
- What occurs in broad and narrow sweep of collision detection?
- Know the four bounding volumes discussed in class
  - Understand their tradeoffs
- Know the 3 ways AABBSs can be represented
Potential Exam Questions

• Understand how a quadtree works
  ► Given a description of a quadtree, and a sample point, draw an example of the tree
• Understand difference between grids and quadtrees as space partitioning approach
• Understand how linear interpolation is used to move along a path
• Understand how A* algorithm works
  ► Given a description of A*, be able to do successive steps in the algorithm by hand
• Understand difference between Song and SoundEffect in XNA
• Given a short code example that plays a Song or SoundEffect, be able to describe what the code does
Potential Exam Questions

• Know difference between left and right handed coordinate systems
• What is a vertex? What is a vector?
• What is a normal vector? What is a normalized vector?
• Know that a camera is comprised of a view and projection matrix
  ► Know what information each matrix holds
• Know what a world matrix does
• What is the difference between a translation and a rotation
• Understand difference between drawing vertices as triangle strip, triangle list, and triangle fan
  ► Given a set of vertices and one of the above, draw the shape
Potential Exam Questions

- What is a model, a mesh, and a bone
  - Know difference between these
- What is a Shader?
- Know what Vertex and Pixel shaders do
- What are HLSL, GLSL, and Cg?
- What is texture mapping?
- What is a texture coordinate? What is a u,v coordinate?
  - Understand how texture coordinates are *scale invariant*
- Given an example of HLSL code, be able to identify:
  - Global variable, semantic, pixel shader, vertex shader, structure, technique, pass, built-in function
  - Where the camera is applied, and the world translation is applied
  - Where a pixel is sampled from a texture
Potential Exam Questions

• What is ambient light?
• What is a point light?
  ▶ Understand how to compute light incident on a point in a model from a point light
• To increase lighting, do what to color values?
• What is a particle system?
Particle Systems

- A particle system is a computer graphics technique for modeling “fuzzy” things
  - Used to simulate explosions, fire, smoke, flowing water, sparks, fog, snow, and others
  - A large number of small moving particles combine together to create the effect
Parameters of a Particle System

- **Emitter**
  - location in space that acts as the source of the particles

- **Spawning rate**
  - How many particles generated per unit time

- **Initial velocity vector**
  - Direction and speed of particles when created

- **Particle lifetime**
  - How long the particles last

- **Particle color**
  - Color of each particle
  - Can also texture map

- Often values are specified as a center value, with allowable variation
  - Lifetime is 60 ticks +/-20 ticks
PointSprite

- XNA provides access to a DirectX feature called PointSprites
  - Permits a particle to be modeled using just a single vertex
    - Previously had used 4 vertices to define a rectangle
  - This single vertex can be colored and textured

- Examine code from Chapter 14 of Learning XNA 3.0