



**ARZAB**

ME/CprE/ComS 557

# **Computer Graphics and Geometric Modeling**

## **Final Project**

November 3, 2016

Rafael Radkowski

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

# Goal

Goal of this project is to plan and realize a computer graphics (CG) **application**, which includes the basic CG techniques which were part of this course such as:

- primitive rendering
- light and material simulation
- texturing / multi-texturing / displacement mapping / bump mapping
- navigation
- animation

You should demonstrate that

1. you understand the techniques
2. you are able to use them in an application

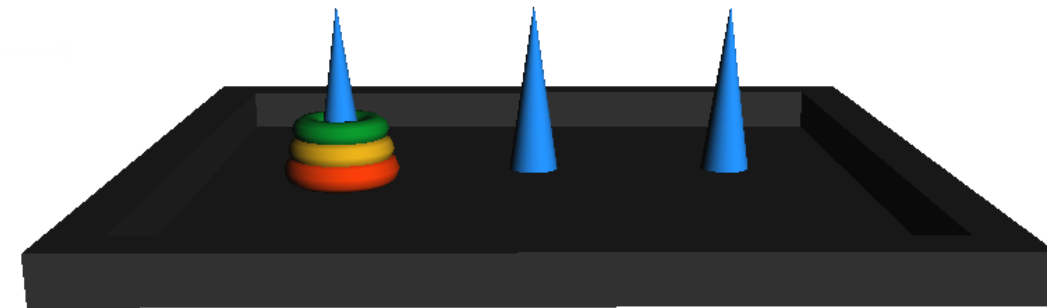
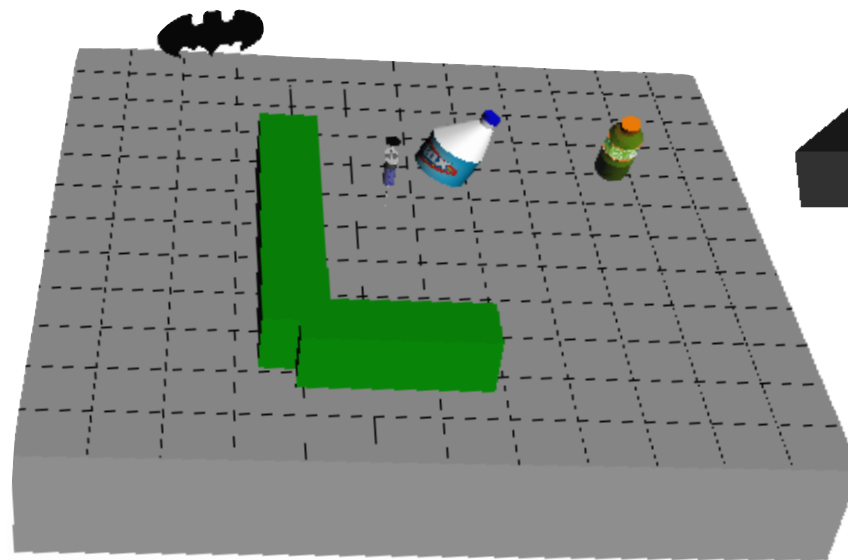
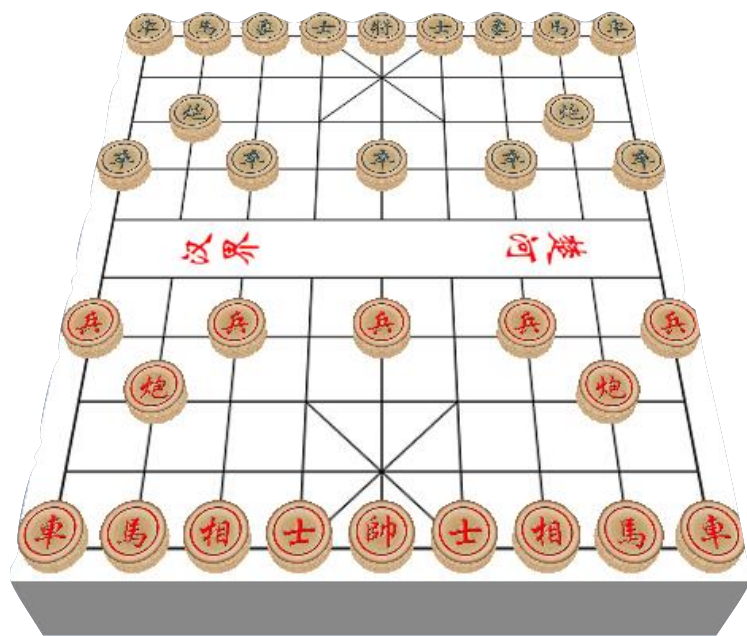
**Due date: Friday, Dec. 16, 2016, 8 pm**

# Application

Plan and develop an application scenario in your team.

You can do whatever you like to do (no violence and pornography).

Games where popular during the last years.

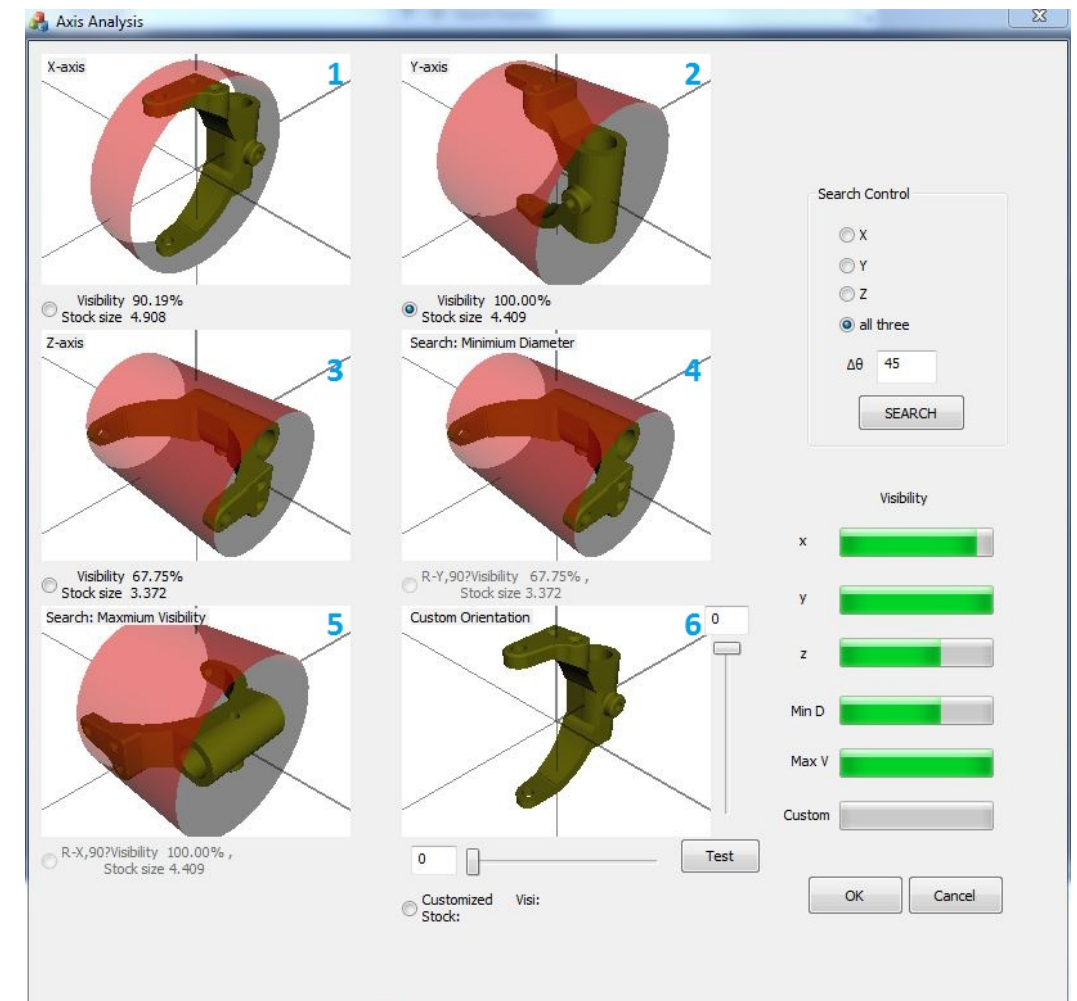
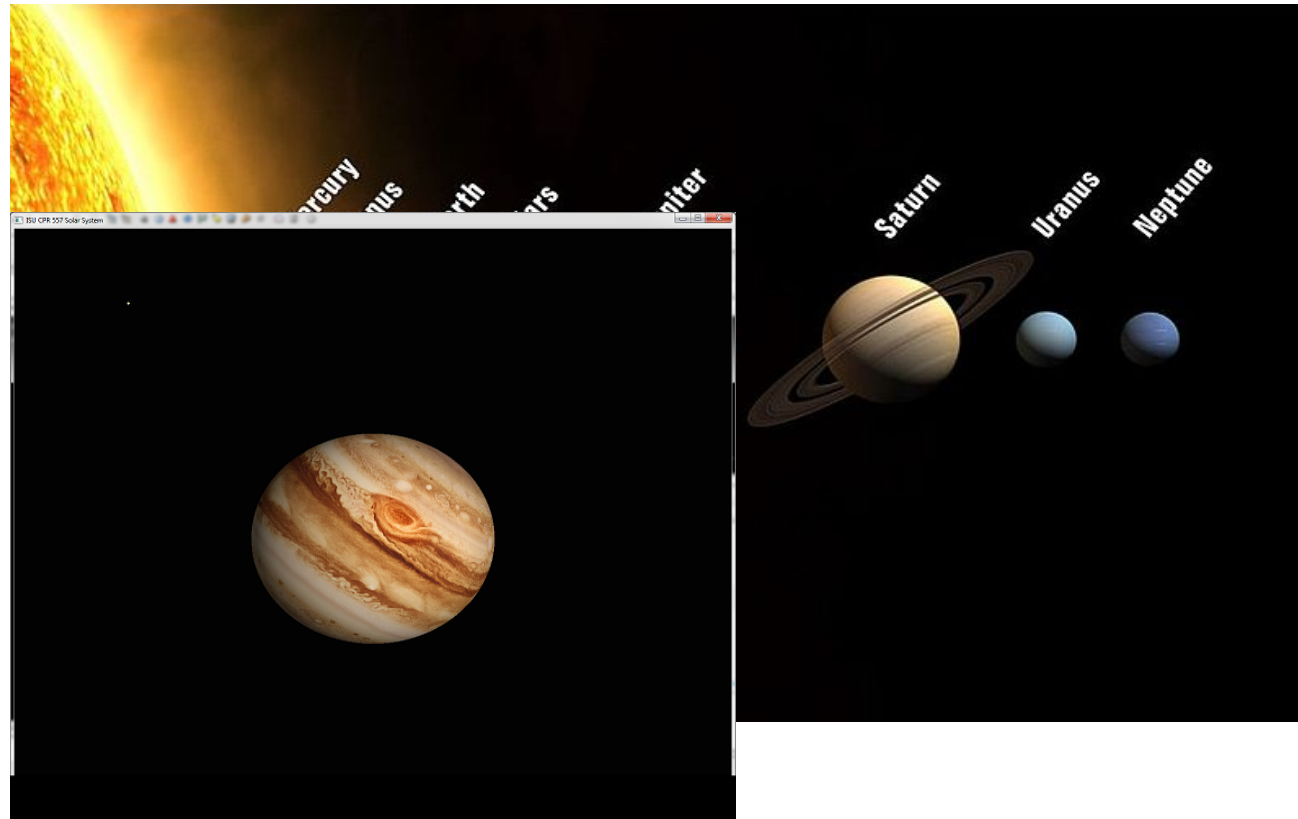


Note, if you like to work on research applications, etc. you **must** be able to submit the **complete** source code along with all libraries.

The code must run on my computer (Windows or Mac OS X operating system)

# Other Applications

# AR/LAB



# Rubric

	Modeling	Light	Appearance (Material)	Navigation / interaction	Keyframe Animation
1	Single primitive or loaded objects	0 <i>you need a single light</i>	Basic specular + diffuse reflect code	Trackball navigation	Single linear transformation
2	Multiple primitives	Combined Spot + direct + point light	Texturing	Navigation in 3D	Animation with rotation and translation
3	Complex object surface	Combined light on surface	Multi-Texturing	Navigation with keyboard + mouse	Triggered (keyboard,etc.) animations
4	Hierarchical model	Combined <b>colored</b> light on surface	Environment Mapping	Navigation along a surface	Animation with collision detection
5	Hierarchical model, h>2	Triggered light sources	Bump or Displacement Mapping	Navigation with multiple cameras	Multiple animation paths per object

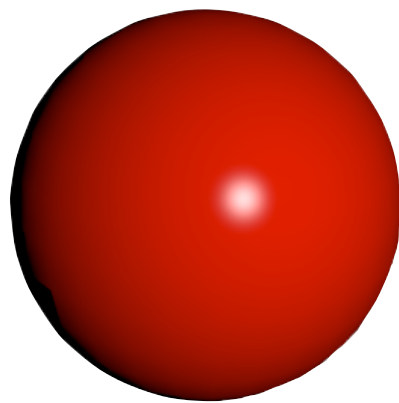
+ Presentation + team assessment



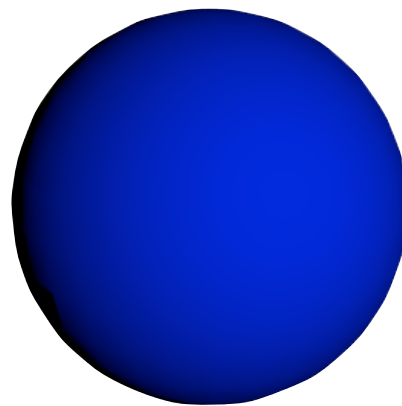
# Notes

**Modeling:** single primitive, cube, sphere, cone, pyramid, plane, line, point, complex surface, e.g. a vehicle, a curved shape, etc.

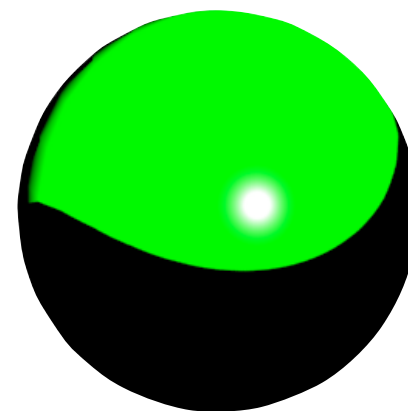
Good **light appearance:** similar to homework 3, no artifacts, light



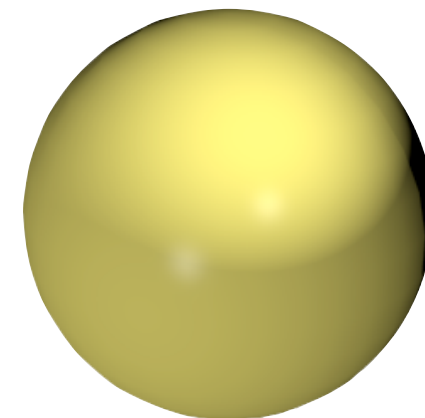
Highlight on  
the surface of  
a diffuse object



Diffuse surface,  
no highlights are  
visible

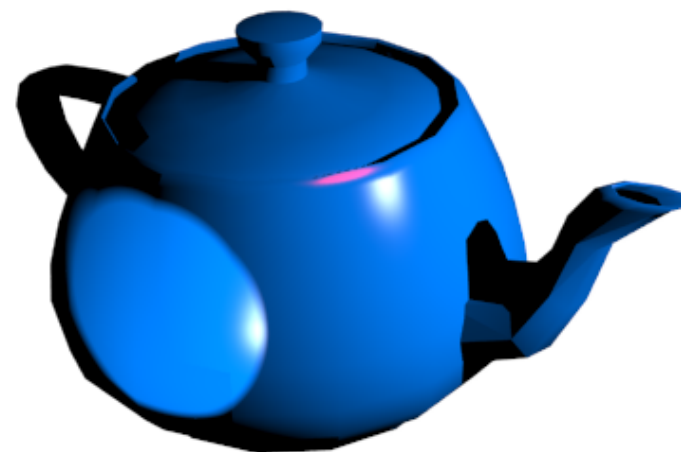


Spotlight with  
small highlight and  
sharp cutoff angle



Little highlight and  
smooth cutoff angle

Combined light on surface: multiple lights appear and can be perceived on the surface.



# ToDo



1. Find a project idea
2. Send a short email to me
  - describing your project (make it short)
  - **due: Nov. 10th, 2016, 8 pm**
3. Work on your project
4. Prepare a presentation (10 minutes per team)
5. Present in class

## Deliver:

- Source code and all models
- Presentation
- Screenshots and/or a video

# Presentation



**8-10 minutes** presentation per team

- Introduce yourself
- Introduce your application, especially the goal of the application.  
What is the user intend to do.
- Explain the objects in your scene and their behavior
- Explain the user interaction
- Highlight the most sophisticated techniques you used.
- Describe your experience.

Minimum presentation time is 8 min.



# Grading



Final project count for 40% of your final grade

Max. 20 points can be collected:

- Max. 15 points from your application
- 5 points presentation

Presentation:

- Online students should submit videos via Blackboard or Youtube

# Thank you!

## Questions

Rafael Radkowski, Ph.D.  
Iowa State University  
Virtual Reality Applications Center  
1620 Howe Hall  
Ames, Iowa 50011, USA

+1 515.294.5580

+1 515.294.5530(fax)

rafael@iastate.edu

<http://arlab.me.iastate.edu>

**ARLAB**



VRAC|HCI

**IOWA STATE UNIVERSITY**  
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[www.linkedin.com/in/rradkowski](http://www.linkedin.com/in/rradkowski)