

Arch. 581 Advanced Rendering

University of Washington - Department of Architecture



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Office hours: Wednesdays (by appointment)

(3 credit hours) Winter 2010
Tuesdays and Thursdays, 10:30 – 11:50
@ Digital Commons (Gould 007)

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<http://courses.washington.edu/render/>

Description

Computer visualization is a powerful tool for architects. Visualization has always been the permanent part of the discipline, though it fluctuates in the wide range of 2D drawings, 3D modeling, rendering, animation, walkthrough, and full-scale virtual environments. Advanced rendering tools use computer models to simulate the complex physical processes that occur during the **light** transport and **material** reflection/refraction/transmission within a given **geometry** to generate digital images that can mimic the physical world and predict the final appearance of a design.

Objectives

1. Provide the opportunity for guided discussions of the technical features of advanced tools and algorithms within the domain of the architectural visualization.
2. Explore the qualitative features of a rendered image (i.e. what is a good rendering?)
3. Provide hands-on experience with Autodesk 3ds Max Design.

Contents

The content of the course is presented through a series of lectures, class discussions, and lab sessions.

Jan 5	Introduction
Jan 7	Quality of renderings: Good and bad rendering examples
Jan 12	Vector and Raster Graphics
Jan 14	Lab session: 3D Modeling
Jan 19	Lab session: Hands-on with Autodesk 3ds Max Design
Jan 21	Rendering algorithms: Ray Tracing and Radiosity
Jan 26	Modeling of Material Appearance, Absorption/Reflection/Transmission
Jan 28	Lab session: Tutorial on Materials – Part 1
Feb 2	Lab session: Tutorial on Materials – Part 2
Feb 4	Work session on rendering project
Feb 9	Modeling of Daylighting in Computer Graphics
Feb 11	Modeling of Electric Lighting in Computer Graphics
Feb 16	Lab Session 6: Tutorial on Lighting
Feb 18	High Dynamic Range Imaging and Exposure Controls
Feb 23	Lab Session: Image based Rendering
Feb 25	<i>Take-home Exam</i>
Mar 2	Lab Session 7: Mental Ray
Mar 4	Lab session 8: Mental Ray
Mar 9	Lab session: Individual crits on final project
Mar 11	Lab Session: Individual crits on final project
Mar 15	<i>Final submission</i>

Student Responsibilities:

1. Attend and participate *actively* in all lecture sessions.
2. Complete the tutorials and exercises in lab sessions. Submit take-home exam and the rendering project on their due dates. Late submissions up to 3 days late will automatically lose 25% of the possible points. Submissions that are more than 3 days late will not be accepted.
3. E-mails sent to the class mail group (arch581a_wi10@u.washington.edu) are required reading. Course materials made available on the class web pages should also be considered required reading. You can access the course home page at <http://courses.washington.edu/render/>, which is under an ongoing construction.
4. Always make a back-up copy of your work. This is common sense and it is a course requirement.

The completed tutorials will be submitted to instructor. The take-home exam is an essay that should address to a series of questions about the technical features of advanced rendering tools and algorithms that are discussed in lecture sessions. The rendering project is an application of an advanced rendering tool to create renderings of a design that you have chosen. The design project should be proposed and discussed with the instructor. Deadlines are given as:

Feb 11	Submission of the 3D model for the rendering project
Feb 25	Take-home exam
Mar 15	Final submission

Grading:

The final grading will be determined based on the following:

1. Students are expected to attend all classes, participate actively and meaningfully to class discussions, and complete lab exercises (20%).
2. Take-home exam (40%)
3. Rendering Project (40%).