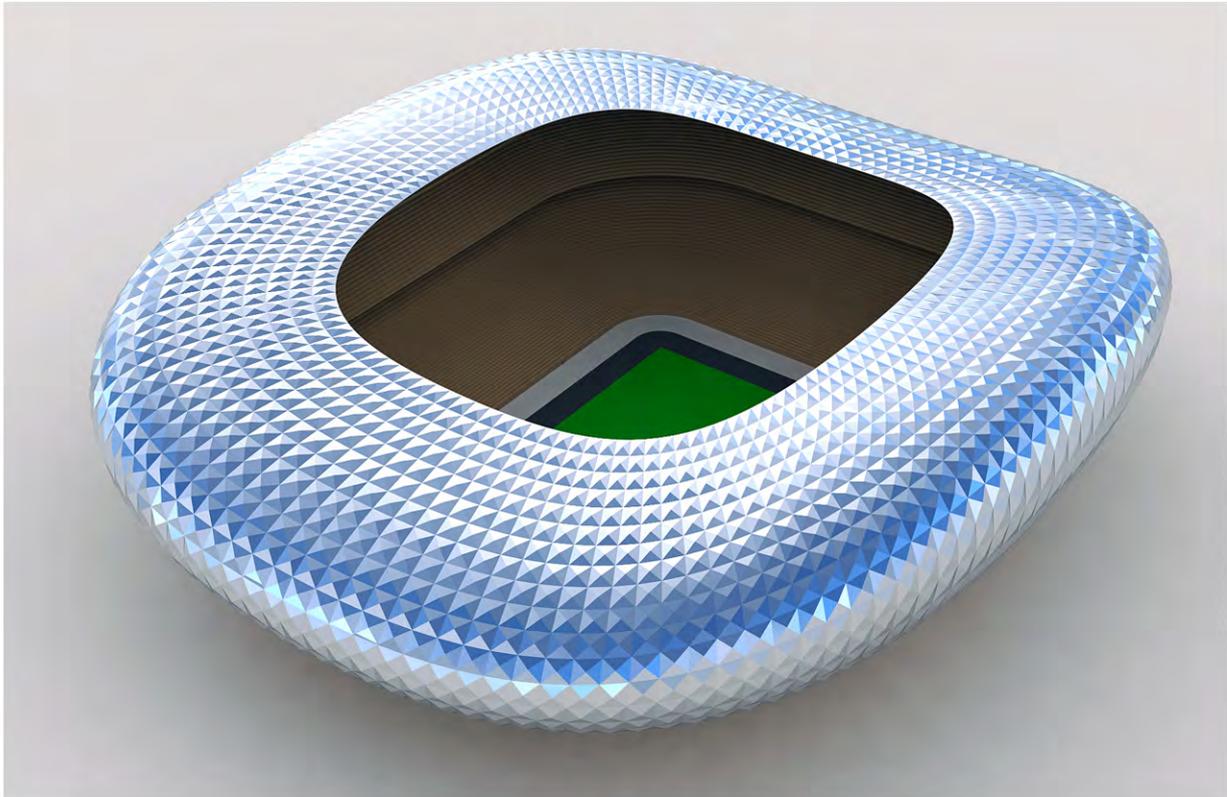


SimplyRhino

sales, training and support



Rhino for Architecture and Engineering Outline & Objectives



RhinoCeros
NURBS modeling for Windows

Simply Rhino Limited
0208 498 9900
www.simplyrhino.co.uk
training@simplyrhino.co.uk

Rhino for Architecture

This course, completely revised for 2010, is geared to professionals in the architectural and engineering industry and is suitable for architects, structural engineers, urban designers and building envelope engineers. The course contains both intermediate and advanced content, the balance of which can be adjusted to suit particular classes. Although the class follows a clearly defined structure there is scope for trainees to discuss individual work examples and work on live projects.

Structure

This comprehensive, fast moving, two day class starts with an introduction as to why and where Rhino is used in a professional Architectural practice. A Rhino refresher then follows before the course moves on to discuss NURBS topology in more detail. This theory is then put into practice in a number of architectural exercises during which a range of tools and strategies particularly useful to architectural professionals are utilised.

Prerequisites

Trainees should have ideally completed the Simply Rhino Level 1 course and have been using Rhino for at least eight weeks.



Curriculum

Introduction

Why Rhino?

Rhino is used by a diverse cross section of the construction industry from concept design stage onwards to develop, visualise and communicate work on projects ranging in scale from master plans and complete bridges to cladding modules and discrete building components. In this short introduction we will examine what differentiates Rhino from other architectural CAD products and examine example uses of Rhino in Architecture.

Rhino Refresher

Modelling Constraints
Construction Planes
Modelling History
Viewport Properties

NURBS Topology

NURBS Geometry Explained
Curve and Surface Degree
Control Points and Edit Points
Point Editing and Rebuilding
Rational and Non-Rational Geometry

Evaluation Tools

Curvature Graph and G-Con
Curvature Analysis
Environment Maps and Zebra



Exercises

Pod Pavilion

This exercise looks at quickly modelling a closed organic form. Once the basic pod form has been modelled, the method of aligning the porthole features normal to the pod surface will be examined. Following this a number of ways of creating the blends between pod body and the glazing and stem will be investigated.

The workflow includes:

Optimisation of key construction curves

Choosing and appropriate method to build the major surfaces

Blending and Filleting

Checking Continuity

Orienting components on the curved building shell

Alternative Strategies

Stadium Concept

Rhino excels in the production of quick and accurate concept models (RIBA stages B-C) and this exercise shows how a freeform stadium canopy can be easily created and then modified as the design concept is evaluated. Initially the canopy is modelled in four identical quadrants and Rhino's History is used so that just one quadrant can be edited and the remaining three quadrants will update automatically.

The workflow includes:

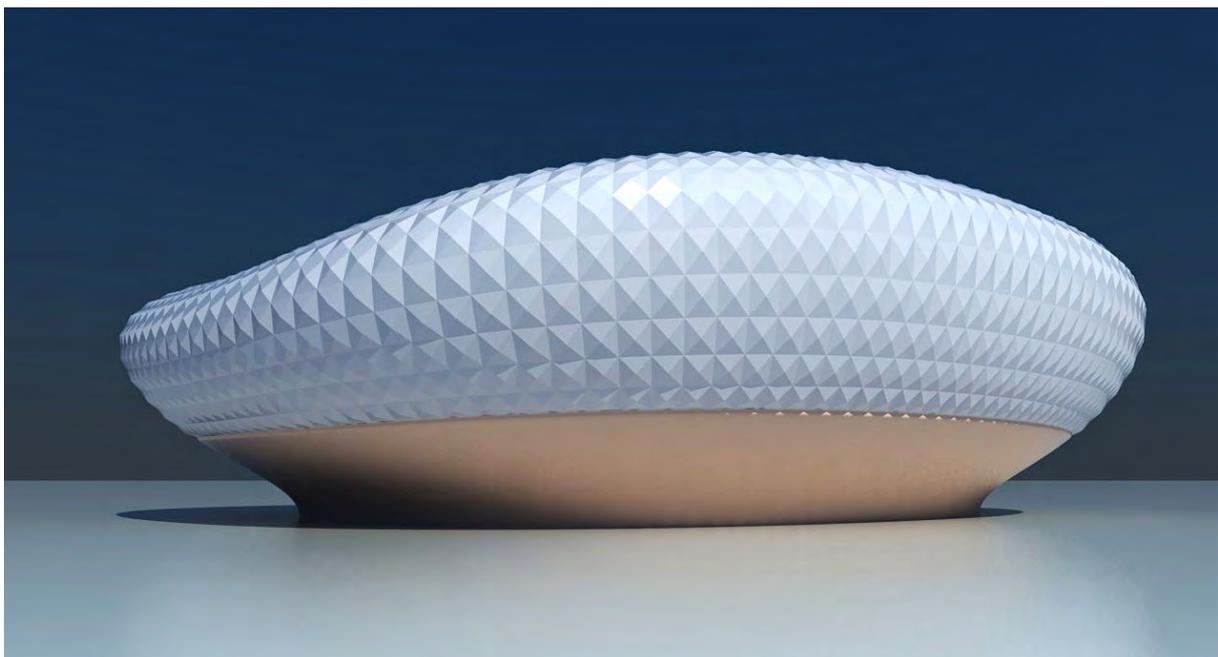
Creating a precise shape with Loose Loft

Exploration of the canopy shape with Rhino History

Surface Analysis

Adding surface detail with Knots and Move UVN

Joined vs Merged surfaces



Panelling Tools

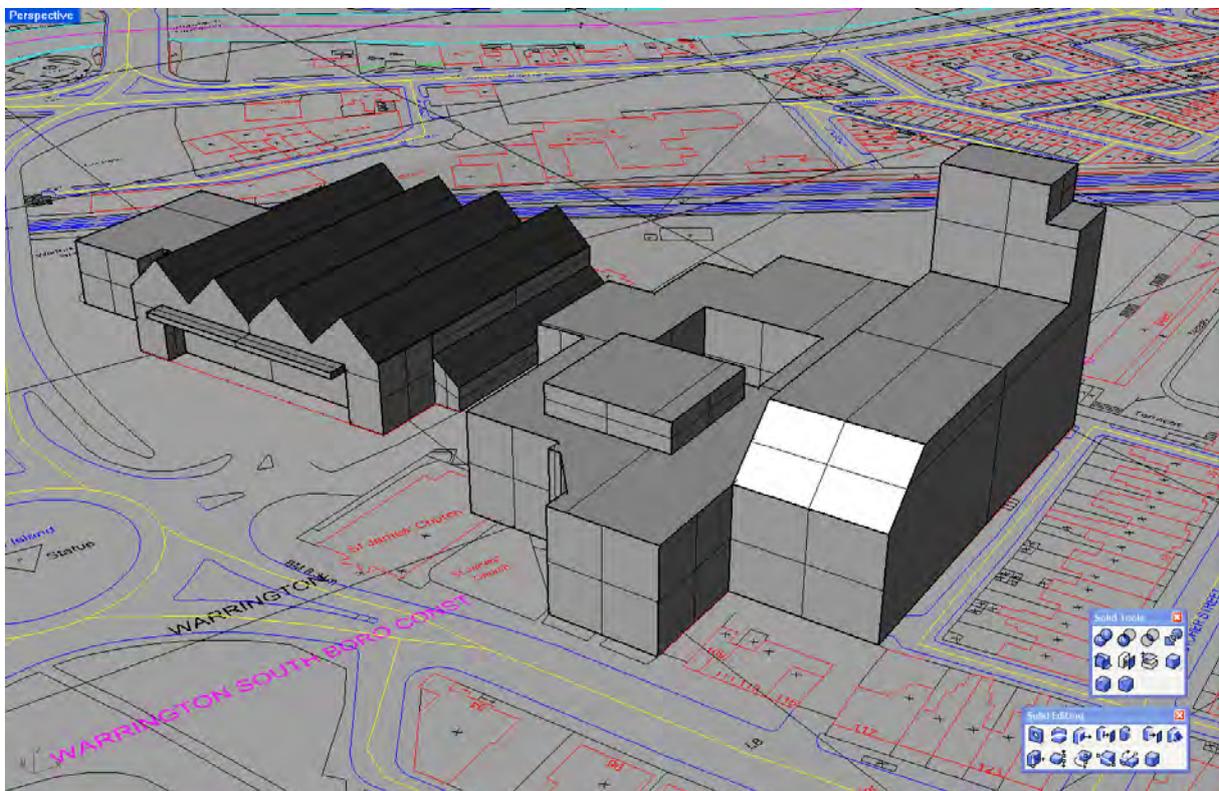
The Panelling Tools plug-in will be introduced and a variety of options explored on the above canopy.

T-Splines

A short demonstration of how T-Splines can be used in an architectural context. T-Splines is a plug-in for Rhino that introduces new modelling workflows more associated with subdivision surface modellers. A NURBS surface can be converted to a T-Splines surface, manipulated and edited and then converted losslessly back into NURBS.

Orient & Array Tools

An exercise looking at how the orient and array tools can be used in an architectural context. This includes some scripted extensions of the built in tools that are supplied as part of the courseware.



2D Legacy Data

Whilst there is a general push towards working in three dimensions much information available to architectural professionals is still firmly based in two dimensions and a good example of this would be a site plan.

Large 2D files pose some problems for Rhino and in this exercise we will look at these issues and the process involved in bringing in 2D data into Rhino.



Massing Study

Rhino can be used to quickly model volumes for massing studies or context in a similar fashion to programs such as SketchUp. The Solid Editing Tools give Rhino a way to work with Simple Planar Solids working with faces and edges in a way that the result is always solid.

Arch-Cut

The ArchCut plug-in for Rhino gives functionality beyond the built in Section and Contour tools. ArchCut sections are live in that the sections placed in 3D space will update if the geometry they reference is modified (within certain limitations) and nested 2D layouts of the 3D sections can be created automatically.

Rhino Terrain

A short demonstration of Rhino Terrain a fast mesh terrain generator for Rhino that takes full advantage of the power of Rhino's geometry creation and graphics capabilities.

Interoperability

Using Rhino with other commonly used architectural CAD eg:

AutoCAD
Revit
Microstation

Apartment Block

Rhino is not a BIM solution and does not impose any method of organisation upon the user. Therefore when working with large data sets the responsibility is with the user to organise files in such a way that a large project remains manageable.

Key areas include:
Layers
Blocks
Worksessions

Presentation

Aside from rendering there is still a need to present formal two dimensional building information. Whilst Rhino does not yet have the 2D sophistication of a product such as AutoCAD or MicroStation there are some useful tools to create and annotate 2D information and these can be presented in a 'paper space' environment that will be familiar to AutoCAD users.

Key areas include:

Sections and Contours

Curves from Objects

Make 2D

Clipping Planes

Page Layouts

Animation Tools

V-Ray Render

V-Ray is a very popular rendering solution in architecture and has been available as a plug-in renderer for 3DS Studio Max for some time. V-Ray for Rhino developed by ASGVIS, brings fast high quality photorealistic visualisation to Rhino.

In this short demonstration we will look at creating simple Skylight renders and the V-Ray sun and sky system.

