Driving Austin: An Urban Simulation of Austin, Texas, Using InfraWorks® and Stingray®

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Before we Begin….

**Please** hold all questions and comments until the end of the lecture.

Silence your phones now!!
Class Summary

Intended for intermediate to advanced users of AutoCAD® Civil 3D® and InfraWorks® software, this class is designed to show civil design professionals techniques and nuances for creating a real-time interactive environment of their site designs using Autodesk's Stingray® game engine.

This class will consist of a live demonstration showing how to create a "world" out of your site design that can be navigated utilizing an Xbox One controller or a virtual reality system.
Key learning objectives

At the end of this class, you will be able to:

- Create simulation modeling data in InfraWorks® from LIDAR and planimetric data
- Export your site model as an FBX, properly convert it, and import it for use in Stingray
- Create an interactive simulation of your civil site design using an Xbox controller
- Create a virtual reality simulation of your civil infrastructure design
https://www.youtube.com/watch?v=XTT9zho6jzA&feature=youtu.be

- Sample VR project
Your new Civil Engineering Design Tools:

https://www.youtube.com/watch?v=Jq5xDI-8hYs

- Sample Site game
The Goal: Get complex Civil3D designs into Autodesk Stingray for creating real-time visualizations.
The Challenge:

Build and interactive simulation of 1 square mile of downtown Austin, Texas
Testing it Out:

“Autodesk CEO Andrew Anagnost experienced Austin, TX virtually! The Virtual Austin experience combines an InfraWorks model …”
The Workflow:

- Classified LiDAR
- Planimetric Land use GIS

= Realtime Simulation
# The Workflow:

<table>
<thead>
<tr>
<th>SAGA GIS</th>
<th>Civil 3D</th>
<th>Infraworks</th>
<th>Stingray</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
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<td>(3)</td>
<td>(4)</td>
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<tr>
<td>a) LiDAR to DEM</td>
<td>a) Pavement Markings</td>
<td>a) Create Model</td>
<td>a) Start Template</td>
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<tr>
<td>b) Smooth DEM</td>
<td>b) Stop Lights</td>
<td>b) Terrain Data Import</td>
<td>b) Delete Assets</td>
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<tr>
<td>c) Export DEM</td>
<td>c) Curb Limits</td>
<td>c) Import</td>
<td>c) Import Site</td>
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<td>(4) Stingray</td>
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<td>(5) Stingray</td>
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<td>a) Start Template</td>
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<td>b) Create Level</td>
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<td>c) Adjust</td>
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<td>g) Test the Level</td>
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A Live Demo of the Workflow....
Step 1: Creating an DEM from LiDAR

www.saga-gis.org
Step 2: Generating Supporting Data in Civil3D

- Shapefiles from ACAD Linework
Step 2: Generating Supporting Data in Civil3D

Street Light Blocks with Rotation Attribute to SHP
Step 2: Generating Supporting Data in Civil3D

- Extract Curbs from Planimetrics
- Fillet the all PI's with small radius
Step 3: Create an Infraworks Model

Add terrain data

Planimetrics with rule style to assign coverages
Step 3: Create an Infraworks Model

Pavement Markings from buffered linework
Step 3: Create an Infraworks Model

Create ‘curb’ road style and apply to curb line work

<table>
<thead>
<tr>
<th>Group/Track Name</th>
<th>Group height transition Zone width</th>
<th>Track Width</th>
<th>Track inner inner height offset</th>
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</thead>
<tbody>
<tr>
<td>Left Group</td>
<td>0.5 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curb</td>
<td>Curb</td>
<td>0.16 m</td>
<td>0.16 m</td>
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<tr>
<td>Roadway</td>
<td>Roadway</td>
<td>0.23 m</td>
<td>-0.20 m</td>
</tr>
<tr>
<td>Right Group</td>
<td>5.0 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>Roadway</td>
<td>0.23 m</td>
<td>-0.2 m</td>
</tr>
</tbody>
</table>
Step 3: Create an Infraworks Model

Street lights from blocks with rotation parameter
Step 3: Create an Infraworks Model

Buildings from an Imported FBX
Step 3: Create an Infraworks Model

Export the model as an FBX file
Step 4: Realtime Driving Simulation

Create a Stingray project from the Vehicle Template
Step 4: Realtime Driving Simulation

Import the Asset and create physics actors
Step 4: Realtime Driving Simulation

Reset the starting location
Step 4: Realtime Driving Simulation

Test run the level
Step 5: Virtual Reality Simulation

Start a VR template and create a new level
Step 5: Virtual Reality Simulation

Add model asset (with physics actor) and add to new level
Step 5: Virtual Reality Simulation

Edit teleport mechanic
Step 5: Virtual Reality Simulation

Edit teleport mechanic
Step 5: Virtual Reality Simulation

Play test your experience
End Live Demo…
Be Heard! Provide AU session feedback

- Give your feedback after each session.
- Give instructors feedback in real-time.
Forget to take notes? No problem!

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AutodeskUniversity.com

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All of your sessions will be there to enjoy again and again.