8 Years’ Worth of Dynamo and Revit Classes from 1 Speaker in 60 Minutes Volume 2

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About Me

Marcello Sgambelluri S.E.
Director of Advanced Technology
at
John A. Martin Structural Engineers
Los Angeles, CA
For 22 years

Past Projects

Sharing Knowledge to AEC Via Blog, Podcast, Comic Book, Youtube Simplycomplex.org
First Revit Family
Revit Zoo Families
Revit Zoo Families
Revit Zoo Families
Marcello’s 2012 thru 2019 (8 Years) of Conference Presentation Statistics

- 25+ UNIQUE CLASSES
- 200+ EXAMPLES
- 1000+ PAGES OF HANDOUTS
- 15+ GB OF DATASETS

1000’s
# Helped Learn Dynamo and Complex Revit

https://a360.co/361XgcN
<table>
<thead>
<tr>
<th>Year</th>
<th>#</th>
<th>CLASS TITLE</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>1</td>
<td>Game Engines for Engineers</td>
<td>Campus</td>
</tr>
<tr>
<td>2019</td>
<td>2</td>
<td>Connecting Dynamo with RAM via API</td>
<td>grids from RAM to REVIT</td>
</tr>
<tr>
<td>2018</td>
<td>3</td>
<td>Capitalizing on Advanced Tech</td>
<td>Queen Mary</td>
</tr>
<tr>
<td>2018</td>
<td>4</td>
<td>ETABS and SAP API</td>
<td>SCULPTURE &amp; AREAS &amp; OR ANALYSIS RESULTS</td>
</tr>
<tr>
<td>2018</td>
<td>5</td>
<td>Zero Touch for Dynamo (1&amp;2)</td>
<td>PT &amp; COW</td>
</tr>
<tr>
<td>2018</td>
<td>6</td>
<td>More Dynamo for Structure</td>
<td>ALIGN OFFSET</td>
</tr>
<tr>
<td>2017</td>
<td>7</td>
<td>Who Should Model the Structural Analysis Model?</td>
<td>DON’T TOUCH MY MODEL COMIC STRIP</td>
</tr>
<tr>
<td>2017</td>
<td>8</td>
<td>REVIT TO 3DSMAX INTERACTIVE</td>
<td>ANIMATION WHILE INTERACTING</td>
</tr>
<tr>
<td>2017</td>
<td>9</td>
<td>Dynamo for Structure</td>
<td>AC LINE</td>
</tr>
<tr>
<td>2016</td>
<td>10</td>
<td>High Tech Structural Engineering</td>
<td>QAQC</td>
</tr>
<tr>
<td>2016</td>
<td>11</td>
<td>More Families in Motion</td>
<td>Classic family editor rotation</td>
</tr>
<tr>
<td>2016</td>
<td>12</td>
<td>Cutting Edge Revit structure Modeling Techniques</td>
<td>Analytical model spend some time here</td>
</tr>
<tr>
<td>2015</td>
<td>13</td>
<td>More Practical Dynamo</td>
<td>Text To upper case</td>
</tr>
<tr>
<td>2015</td>
<td>14</td>
<td>Families in Motion</td>
<td>Lift IK</td>
</tr>
<tr>
<td>2015</td>
<td>15</td>
<td>Dynamo for Contractors (1&amp;2)</td>
<td>Ramp</td>
</tr>
<tr>
<td>2015</td>
<td>16</td>
<td>Dynamo for Dummies</td>
<td>Get Set wall columns</td>
</tr>
<tr>
<td>2014</td>
<td>17</td>
<td>Practical Dynamo</td>
<td>dynamo engine build + 3d rooms</td>
</tr>
<tr>
<td>2013</td>
<td>18</td>
<td>How to Prepare and Deliver an Engaging Presentation</td>
<td>Feelings</td>
</tr>
<tr>
<td>2013</td>
<td>19</td>
<td>Make Hardscape Follow Site TopographyY</td>
<td>Head topo follow</td>
</tr>
<tr>
<td>2013</td>
<td>20</td>
<td>Learn to Scale and Morph Families in Autodesk Revit</td>
<td>Plating Corinthian</td>
</tr>
<tr>
<td>2012</td>
<td>21</td>
<td>Exciting New Methods to Model Complex Geometry</td>
<td>intersection method follow beams</td>
</tr>
<tr>
<td>2012</td>
<td>22</td>
<td>Revit Family Modeling Secrets Revealed!</td>
<td>Cow</td>
</tr>
<tr>
<td>2012</td>
<td>23</td>
<td>Power Points &amp; Power Plays</td>
<td>use repeater on swooping ceiling</td>
</tr>
<tr>
<td>2012</td>
<td>24</td>
<td>Ride the Rails: New Ways to build Rotation Parameters</td>
<td>rotatin rig method couple with IK and lift</td>
</tr>
<tr>
<td>2012</td>
<td>25</td>
<td>Customizing the Graphical Column Schedule</td>
<td>Tags and switch category to structural columns</td>
</tr>
</tbody>
</table>
2012

Graphical Column Schedule

Family Secrets Revealed!

1st Place Speaker Award at AU 2012
1st Place Speaker Award at BILTANZ 2012
Scale and Morph Families

2013

How to Scale Using Planting Category

Deliver an Engaging Presentation

Tips to Engage Your Audience During a Presentation

Engage Your Audience by Making Them Feel Great

I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.

Maya Angelou

Revit Massing Family

Notes

Make Hardscape Follow Site Topography

Hardscape Follow Topo Using DWG

Steps

1. Open the file "straight_wall_start.rvt" or create a new topo surface.
2. Go to the site plan and add a rectangular building pad boundary between grids 1 to 2 and A to B as shown.
3. Select the “new topo” element and export that new topo element as a DWG.
4. Create an in-place mass.
5. Insert the newly exported DWG.
6. Go back to the site plan and add a straight wall in plan. Edit the profile and pick the edge of the in-place mass. DWG until all the edges on grid A of the DWG are picked.
7. Reshape the wall profile. Select the top of the wall and copy it vertically. The wall profile should look like the figure shown.

Revit Topography

Notes

1st Place Speaker Award at AU 2013
1st Place Speaker Award at BILT NA 2013
1st Place Speaker Award at BILT ANZ 2013
Practical Dynamo

2014

1st Place Speaker Award at AU 2014

1st Place Speaker Award at BILT NA 2014
Dynamo for Contractors

2015

More Practical Dynamo

1st Place Speaker Award at AU 2015
1st Place Speaker Award at BILT NA 2015
Revit Structure Modeling Techniques

2016

More Families in Motion*

Create a Rotation Rig in Revit AC or Massing Family

1. Select the analytical model and click "Analytical Adjust". Adjust the node location so it is at the same location as the other node.

2. Edit beam family and add a model line. Make sure to lock the model line to the ends of the beams and the middle of the beam and add the model line at the top of the beam.

3. Reload the beam back into the project. 2D align the beam model line to the analytical line.

Notes: This method could be used on any Revit framing that has an analytical model, but only if it works best on roof framing and framing must not have its "D" value adjusted or else analytical line will not be at beam work line ldc.

Notes: This method uses the massing or adaptive components to create a stable family rotation rig. This is a general use rig and could be linked together to form multiple rotation rigs.

ORIENT BEAM FRAMING TO SURFACE USING AC

Notes: This method uses adaptive components as beams and since the points are hosted to the surface the adaptive components will orient to the surface.

Create a Reference Circle

1. Create a reference circle.
2. Place two points anywhere on the circle.
3. Change the heading/offset type to "angle" in the properties for both points.
4. Create parameter to the first point.
5. Create parameter for the second point that is ~180 degrees of the first.
6. Select both points and click "Spline thru points".
7. Change new line to "reference line" (this is the newly hosted reference line).
8. Host whatever you want to the reference line.
9. When the angle parameter is changed it will be at any practical angle including 0 and 80 and 180.

Notes: This method uses the massing or adaptive components to create a stable family rotation rig. This is a general use rig and could be linked together to form multiple rotation rigs.

High Tech Structural Engineering

QA/QC Your Revit Framing and Fix It Using the Analytical Model

1st Place Speaker Award at BILT NA 2016
1st Place Speaker Award at BILT ANZ 2016
1st Place Speaker Award at BILT EUR 2016
2017

1st Place Speaker Award at AU 2017

Dynamo for Structure

CREATE BEAMS FROM 2-PT AC LINE FAMILIES

STEP 1
CREATE A 2-POINT AC FAMILY AND LOAD INTO PROJECT

STEP 2
OPEN "BEAMS_AC_LINES_START.RVT"

STEP 3
PLACE DYNAMO NODES AND DYNAMO WILL PLACE BEAMS ON AC LINES

STEP 4
PLACE 2-POINT AC FAMILIES IN PROJECT AS ROOF FRAMING

NOTES
CONSIDER USING A 2-PT AC FAMILY FOR ROOF FRAMING IN LIEU OF BEAM FRAMING.
PLACE THE BEAMS ON THE AC FAMILIES VIA DYNAMO.

3DSMAX INTERACTIVE

INTERACTIVE: CONTROLLING MOVING EQUIPMENT

OPEN MAX FILE AND EXPORT VIA MANUAL FBX EXPORT AND SAVE FILE

OPEN IN UNIT EDITOR AND ADD CONTROL FLOW NODES

DEPLOY FROM INTERACTIVE TO A STAND ALONE GAME. THE LIVE TEMPLATE WORKS BEST.

Who Should Model What
More Dynamo for Structure

**2018**

**1st Place Speaker Award at AU 2018**

**1st Place Speaker Award at BILT NA 2018**

**Advanced Tech A New Position**

**Dynamo for SAP/ETABS**

**ZERO TOUCH DYNAMO C#**
Connecting Dynamo with RAM via API

2019

Game Engines for Engineers

1st Place Speaker Award at AU 2019
2020

Grasshopper for Revit

8 Years Worth of Dynamo and Revit

Rhino Inside Revit

Convert Surfaces from Revit to Rhino

Steps:
1. Open Revit Model RHINO_TO_REVIT.RFA
2. Activate Rhino Inside Revit
3. Open New Grasshopper File
4. Open New Rhino File
5. Add Grasshopper Nodes as Shown
   - Right Click on "Face" Node and Multiselect Revit Faces and Click "Finish"
6. Right Click on "Geometry" Node and Select "BAKE"
   - Note: "BAKE" Writes Grasshopper Geometry to Rhino

Node Selects Faces in Revit

Node Converts Revit Geometry to Grasshopper Geometry

Rhino To Revit.Rfa File (Yes it is a Rhino in Revit)

Rhino To Revit.3dm File (Yes it is a Rhino in Rhino)

Steps:
Add the Grasshopper Nodes as Shown and Follow the Steps Shown

Notes:
There are Many Ways to Bring Revit Geometry into Rhino. This is Only One Method.
8 Years’ Worth of Dynamo and Revit Classes BY: Marcello Sgambelluri

Customizing the Graphical Column Schedule: Create Smart Tags (GCS) 2012

CREATE SMART TAGS AT BOT OF
GRAPHICAL COLUMN SCHEDULES

STEP 1
CREATE A COLUMN TAG FAMILY WITH BOUNDARY AND
GRAPHICS AS SHOWN.

STEP 2
CREATE SHARED PARAMETERS IN COLUMN FAMILY
THAT SHOULD BE DISPLAYED IN COLUMN TAG
(BASE PLATE DIMENSIONS AND BOLT INFO SHOWN)

STEP 3
ADD SHARED PARAMETERS OF COLUMN TO TAG

STEP 4
ADD TAG TO BASE OF COLUMN SCHEDULE

NOTE:
THE GRAPHICAL COLUMN SCHEDULE IS NOT CUSTOMIZABLE THEREFORE ADDING A SMART TAG AT
THE BASE OF THE COLUMN SCHEDULE ALLOWS FOR INFORMATION SUCH AS BASE PLATE SIZES
AND DETAIL INFORMATION TO SHOW UP
CREATE A ROTATION RIG IN REVIT AC OR MASSING FAMILY

RIDE THE RAIL METHOD

STEPS
1. CREATE A REFERENCE CIRCLE.
2. PLACE TWO POINTS ANYWHERE ON THE CIRCLE.
3. CHANGE THE MEASUREMENT TYPE TO "ANGLE" IN THE PROPERTIES FOR BOTH POINTS.
4. CREATE PARAMETER TO THE FIRST POINT.
5. CREATE PARAMETERS FOR THE SECOND POINT THAT IS + 180 DEGREES OF THE FIRST.
6. SELECT BOTH POINTS AND CLICK "SPLINE THRU POINTS".
7. CHANGE NEW LINE TO "REFERENCE LINE" (THIS IS THE NEW HOSTING REFERENCE LINE).
8. HOST WHATEVER YOU WANT TO THE REFERENCE LINE.
9. WHEN THE ANGLE PARAMETER IS CHANGED IT IS STABLE AT ANY PRACTICAL ANGLE INCLUDING 0 AND 90 AND 180.

NOTES: THIS METHOD USES THE MASSING OR ADAPTIVE COMPONENTS TO CREATE A STABLE FAMILY ROTATION RIG. THIS IS A GENERAL USE RIG AND COULD BE LINKED TOGETHER TO FORM MULTIPLE ROTATION RIGS.
CREATE A DROPPED CEILING USING A DIVIDED PATH+AC

STEPS

1. OPEN POWER_POINT Power Point
   OPEN_PLAY_2012 START/End

2. SELECT ON BOTH LINES AND DIVIDE PATH

3. CHANGE THE PATH SETTINGS AS SHOWN

4. PLACE THE 2 PT ADAPTIVE COMPONENT
   "SINGLE COMPONENT" SUCH THAT PT 1 AND
   PT 2 ARE AT THE ENDS OF THE DIVIDED
   PATH AS SHOWN

5. CLICK ON ADAPTIVE COMPONENT AND
   CLICK THE REPEATER COMMAND.

6. RESULTS ARE SHOWN BELOW

7. CHANGE THE PATH SETTINGS OR
   LINE GEOMETRY AND WATCH DYNAMIC
   CHANGES

NOTES: THIS METHOD IS GOOD FOR PLACING FRAMING IN EARLY DESIGN.
      THESE ARE NOT STRUCTURAL FRAMING ELEMENTS AND MAY NEED TO BE CHANGED AT A
      LATER TIME AS THE DESIGN IS FINALIZED
HOW TO BUILD A COW IN REVIT

**STEPS**

1. TAKE PICTURES OF A COW (YES A REAL COW) AND CREATE A 3D MESH MODEL USING 3DS MAX OR SIMILAR SOFTWARE. IF YOU ALREADY HAVE A 3D MESH OF A COW THEN SKIP THIS STEP.

2. CLEAN UP THE MESH AND OPEN IN RHINO OR 3DSMAX. GO TO A SIDE VIEW AND REPLICATE BY ARRAY THE PLANES AS SHOWN. SELECT THE PLANES AND COW AND USE THE "INTERSECT" COMMAND. THIS WILL CREATE ALL THE PROFILES NECESSARY TO MAKE A FORM IN REVIT. NOTICE THAT THE PROFILES ARE RADIAL FROM THE BACK FEET TO THE MIDDLE OF THE COW.

3. EXPORT PROFILE LINES INTO REVIT MASSING OR RC FAMILY AND SELECT THE SPLINE "THRU POINTS" COMMAND AND CLICK THE ENDS OF EACH STRAIGHT-LINE SEGMENT TO CREATE REVIT SPLINES AS PROFILES.

4. WITH ALL THE REFERENCE LINES SELECTED CLICK THE "CREATE FORM" BUTTON. MIRROR THE OTHER SURFACE TO COMPLETE THE COW.

**NOTES**

NOTE: MAKE SURE THAT THERE ARE SMOOTH TRANSITIONS BETWEEN EACH PROFILE CURVE. THIS HELPS TO GET THE BODY SURFACE CREATED IN ONE FORM. THIS METHOD ONLY EXPLAINS HOW TO CREATE THE MAIN BODY OF THE COW NOT THE HORNS ETC.
CREATE FLOOR THATFollowS CURVED WALL

STEPS

1. CREATE A WIDE AND THICK FLOOR SURFACE AT THE DESIRED LOCATION OF THE FLOOR
2. JOIN THE COW WALL AND FLOOR.
3. EDIT THE WALL BOUNDARY
4. SELECT THE EDGE OF THE NEWLY CREATED JOINED WALL.
5. COMPLETE THE SKETCH SO THE FLOOR BOUNDARY CREATES A CLOSED LOOP.
6. CLICK FINISH. THE FINAL PRODUCT SHOULD LOOK LIKE THE FIGURE BELOW.

NOTE: THE METHOD ABOVE COULD BE USED TO HAVE FLOORS FOLLOW ALL TYPES OF WALL
SHAPES. ROOF ELEMENTS ALSO WORK. THE IMPORTANT STEP IS TO JOIN THE FLOOR
WITH THE WALL SO THE RESULTING JOINED SOLID HAS A "PICKABLE" EDGE.
Learn to Scale and Morph Families in Autodesk Revit 2013

**HOW TO SCALE USING PLANTING CATEGORY**

Scaling by planting family is basically a trick that is from [http://revit SWAT.WORDPRESS.COM](http://revit SWAT.WORDPRESS.COM) where nesting the family into another planting family or change the category to planting. When the family is loaded into the project and the preset HT parameter value is changed then the entire family scales as shown. If there is no "height" parameter then create one as a type.

**NOTE:** This method works great on complex families as shown however requires multiple nesting to get it to scale in a predictable manner and there is little to no control over the scale origin or fine tune control.
HARDSCAPE FOLLOW TOPO USING DWG

STEPS

1. OPEN THE FILE "STRAIGHT_WALL_START.RVT" OR CREATE A NEW TOPO SURFACE.
2. GO TO THE SITE PLAN AND ADD A RECTANGULAR BUILDING PAD BOUNDARY BETWEEN GRIDS 1 TO 2 AND A TO B AS SHOWN.
3. SELECT THE "NEW TOPOGRAPHY" ELEMENT ISOLATE AND EXPORT THAT NEW TOPOGRAPHY ELEMENT AS A DWG.
4. CREATE AN IN-PLACE MASS
5. INSERT THE NEWLY EXPORTED DWG
6. GO BACK TO THE SITE PLAN AND ADD A STRAIGHT WALL IN PLAN. EDIT THE PROFILE AND PICK THE EDGE OF THE IN-PLACE MASS’ DWG UNTIL THE EDGES ON GRID A OF THE DWG ARE PICKED.
7. RESHAPE THE WALL PROFILE. SELECT THE TOP OF THE WALL AND COPY IT VERTICALLY. THE WALL PROFILE SHOULD LOOK LIKE THE FIGURE SHOWN.

NOTE: THE BUILDING PAD IS SACRIFICIAL GEOMETRY TO CREATE THE STRAIGHT WALL AND YOU WILL BE USING ITS UPPER EDGE TO LOCATE THE WALL. IF A DWG IS NOT PREFERRED TO BE LEFT IN REVIT THEN DELETE IT. NOT USING THIS METHOD IS ALSO AN OPTION.
ENGAGE YOUR AUDIENCE BY MAKING THEM FEEL GREAT

I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.

-Maya Angelou

TIPS TO ENGAGE YOUR AUDIENCE DURING A PRESENTATION

You need to engage the audience and you need to make sure that what you are saying is coming from your heart. I realized quickly that it is people’s emotions that you need to reach out to and make them feel like you care. That is how you get the audience to remember your presentation. All you need to do is keep them interested, active and feeling like you care about them. When I am at a conference, I ask people: I know when they leave a presentation, what they thought about it. When the presentation is uneventful I get an answer such as “It was ok” or a little shoulder shrug. When the presentation was engaging or made them feel good the answer is almost always “That was amazing” so the point is you want to engage the audience to turn this comment “It was ok” to this comment “That was amazing”!

The easiest way to engage an audience is to ask questions. Before I start a presentation I always poll the audience to find out who is actually in the audience.

NOTES: For more information visit the Autodesk website and watch the class on “How to Engage an Audience.”
8 Years' Worth of Dynamo and Revit Classes BY: Marcello Sgambelluri

Practical Dynamo 2014

CREATING SURFACES WITH PROFILE ORDER

THESE NODES SELECT THE PROFILE CURVES

THIS NODE CREATES A LIST IN THE CORRECT PROFILE ORDER

THIS NODE CREATES THE SURFACE LOFTED OVER THE CORRECT PROFILE ORDER

STEP 1: OPEN REVIT FILE "PROFILEORDER_START.RVT"
STEP 2: OPEN A NEW DYNAMO FILE AND ADD NODES AS SHOWN
STEP 3: SELECT ELEMETN 0, 1, 2 IN THAT ORDER USING THE "SELECT" NODE AND RUN
NOTE: THE REVIT MASSING FAMILY DOES NOT ALLOW FOR PROFILES TO BE SELECTED IN ORDER
GET AND SET INSTANCE PARAMETERS WITH LINK FILE

- Select Model Element
- Category
- Element Type
- Link Reference
- Category

GETS THE WALL ELEMENTS FROM THE LINKED FILE IN REVIT (AMAZING)!
(NOTE: THIS IS A CUSTOM NODE IN THE SPRING NODE PACKAGE)

- Code Block
- Base Offset

GETS THE BASE OFFSET PARAMETER VALUE

- Family Types
- Column-Square Column: 8 x 8
- Family Type

SELECTS ALL THE COLUMN TYPES IN THE PROJECT

- Elements of Family Type
- Family Type
- Elements

SETS THE BASE OFFSET PARAMETER OF THE COLUMN TO THE BASE OFFSET PARAMETER OF THE WALL

STEP 1: OPEN FILE "GET_SET_PARAMETERS_START_LINK.RVT"
STEP 2: OPEN A NEW DYNAMO FILE, PLACE NODES AS SHOWN AND RUN SCRIPT FOR EACH COLUMN
SELECT THE LINKED FILE USING THE "SELECT MODEL ELEMENT" UI NODE

NOTES: LINKED FILES ARE "READ ONLY"
SURFACE AREA OF RAMPS

1. Select Model Element
   - Change: Elements
   - Element: 30935

2. Element.Faces
   - code Block
   - x: [3]

3. This node extracts all the surfaces of the ramp
4. This node extracts the surface area of the “top” surface of the ramp

NOTE: If the ramp is straight, use [0]

RAMP GEOMETRY

NOTE: Use the method above to extract other areas from Revit solids such as roofs, floors, foundation slabs, etc.

Steps:
1. Open file “RAMP_AREA_START.RVT”
2. Open a new Dynamo file, place nodes as shown and run script
   Notes: To get the area of the sides and bottoms, simply delete the top surface area from the total surface area
TOTAL SURFACE AREA OF MECH EQUIPMENT

THIS NODE SELECTS ALL THE ELEMENTS IN REVIT

THIS NODE CONVERTS ALL THE REVIT FAMILY GEOMETRY TO DYNAMO SURFACES

THIS NODE FLATTENS ALL THE ITEMS INTO A SINGLE LIST

STEP 1: OPEN FILE "SURFACE_AREA_ROBOT_START.RVT"
STEP 2: OPEN A NEW DYNAMO FILE, PLACE NODES AS SHOWN AND RUN SCRIPT
NOTES: ALT. METHOD IS TO EXTRACT SOLID AND GET SURFACE AREA
AND COULD BE USED ON MOST REVIT SOLID AND SURFACE ELEMENTS

DYNAMO FOR CONTRACTORS PART 2 2015
CREATE A ROTATION RIG IN REVIT USING A REVOLVE

REVOLVE ELEMENT (WITH CONSTANT LENGTH)

END ANGLE

HOST CONTENT ON THIS REFERENCE LINE

REFERENCE LINE

CONTROL ROTATION VIA START AND END ANGLES OF REVOLVE EXTRUSION

REVOLVE METHOD

REVIT ADAPTIVE COMPONENT OR MASSING ENVIRONMENT

START ANGLE

NOTES: THIS METHOD USES THE START AND END ANGLES TO CONTROL THE ANGLE NOT THE ANGLE PARAMETER. THIS WAY THE REVOLVE ELEMENT COULD BE A CONSTANT ARC LENGTH AND ANGLE AND THE END ANGLE IS "CHASING" ITS START ANGLE. THIS COULD BE USED ON FAMILIES AT ROTATION POINTS SUCH AS FOR THIS TELEHANDLER FAMILY

3D VIEW
TEXT TO UPPERCASE SHEET NAMES

1. THIS NODE SELECTS THE SHEET CATEGORY
2. THIS NODE SELECTS ALL THE SHEETS IN THE REVIT PROJECT
3. THIS NODE GETS THE SHEET NAME
4. THIS NODE CHANGES THE TEXT IN THE SHEET NAME TO UPPERCASE
5. THESE NODULES SET ALL THE SHEET NAMES TO UPPERCASE

STEP 1: OPEN REVIT SAMPLE PROJECT "TEXT_TO_UPPERCASE_SHEET_NAMES_START.RVT"
STEP 2: OPEN A NEW DYNAMO FILE, PLACE NODES AS SHOWN AND RUN SCRIPT
NOTES: THE METHOD ABOVE WORKS WELL WHEN CHANGING MANY SHEET NAMES TO UPER CASE
ORIENT BEAM FRAMING TO SURFACE USING AC

STEP 1
OPEN FILE BEAM_ORIENTATION_START.RVT
SELECT THE SURFACE AND CLICK DIVIDE SURFACE
CHANGE THE GRID SPACING TO 1 AND 12
DISPLAY THE NODES ON THE DIVIDED SURFACE
ADD THE TWO-PONT AC TO EACH DIVIDED SURFACE NODE

STEP 2
SELECT THE AC AND CLICK THE REPEAT ICON
WATCH THE BEAMS ORIENT TO THE SURFACE

NOTES: THIS METHOD USES ADAPTIVE COMPONENTS AS BEAMS AND SINCE THE POINTS ARE HOSTED TO THE SURFACE THE ADAPTIVE COMPONENTS WILL ORIENT TO THE SURFACE
CREATE BALL JT ROTATION VIA HOSTING PT ON SURFACE

**STEP 1**
Create a reference line revolve a circle round that reference line to create a sphere.

**STEP 2**
Place two points and host them on the sphere. Place a reference "spline" between these points. Host anything to the reference line. Create parameters to control the locations of reference line similar to the "revolve" method. Use a new host if points need to be repositioned.

**NOTES:** This method uses the start and end points hosted on the sphere to control the reference line. This method could be used to simulate ball joint movements. In the example shown it is showing how to move the head of a cow modeled in Revit.
8 Years' Worth of Dynamo and Revit Classes BY: Marcello Sgambelluri,

High Tech Structural Engineering 2016

**QA/QC YOUR REVIT FRAMING AND FIX IT USING THE ANALYTICAL MODEL**

**STEP 1**
Select the analytical model and click "analytical adjust." Adjust the node location so it is at the same location as the other node.

**STEP 2**
Edit beam family and add a model line. Make sure to lock the model line to the ends of the beam. Place the middle of the beam and add the model line at the top of the beam.

**STEP 3**
Reload the beam back into the project. 3D align the beam model line to the analytical line.

**NOTES**
This method could be used on any Revit framing that has an analytical model behind it. This method works best on roof framing and framing must not have its "Z" value adjusted or else analytical line will not be at beam work line loc.
Dynamo for Structure 2017

CREATE BEAMS FROM 2-PT AC LINE FAMILIES

**STEP 1**
CREATE A 2-POINT AC FAMILY AND LOAD INTO PROJECT

**STEP 2**
OPEN "BEAMS_AC_LINES_START.RVT"

**STEP 3**
PLACE DYNAMO NODES AND DYNAMO WILL PLACE BEAMS ON AC LINES

**STEP 4**
PLACE 2-POINT AC FAMILIES IN PROJECT AS ROOF FRAMING

**NOTES**
CONSIDER USING A 2-PT AC FAMILY FOR ROOF FRAMING IN LIEU OF BEAM FRAMING. PLACE THE BEAMS ON THE AC FAMILIES VIA DYNAMO.
8 Years' Worth of Dynamo and Revit Classes BY: Marcello Sgambelluri

INTERACTIVE: SIMPLY CONSTRUCTION ANIMATIONS

STEP 1
OPEN MAX FILE AND SET UP ANIMATIONS. SELECT THE ELEMENTS AND EXPORT "FBX SELECTED. VERIFY THAT "BAKE ANIMATION" IS CHECKED

STEP 2
OPEN INTERACTIVE FILE (BEST RESULTS WITH LIVE TEMPLATE AND IMPORT THE FBX.

STEP 3
AFTER FBX IMPORT PLACE THE ASSET IN SCENE. ADD FLOW NODES AS SHOWN TO CONTROL THE ANIMATION (ANIMATION CONTROLLER IS NOT NEEDED) CONSIDER ADDING A "STOP" CONTROL AS WELL. TEST AND DEPLOY! NOW YOUR USERS COULD ZOOM AND PAN AS ANIMATION RUNS. NO MORE STATIC ANIMATION CAMERAS

NOTE
FOR ELEMENTS WITH ANIMATION ITS MORE STABLE TO EXPORT VIA FBX AND THEN IMPORT INTO INTERACTIVE THEN TO USE THE MAX TO INTERACTIVE LINK.

Revit to Max Interactive 2017
Who Should Model the Structural Analysis Model? 2017

The AEC-Complex Comic

THE FIRST OF A JUST RIGHT END ASSIST TO HELP AS AN ARCHITECT I COULD HELP AS NEEDED. I AM BAD AT THE BEGINNING. STARTING ENGINEERS ARE GOING TO START OF HEAL.

NO WAY THEY DON'T HELP IT UP. THEY HAVE NO BUSINESS OPENING THEIR UP.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.

WE NOW YOU DESERVE HOW THEY FEEL.
ALIGN REVIT BEAMS WITH AN OFFSET WITH DYNAMO PLAYER

SELECTS THE BEAM TO ALIGN
NOTE: SELECTION UI NODES BECOME INPUT IN DYNAMO PLAYER

SELECTS THE EDGE OF THE OPENING
NOTE: SELECTION UI NODES BECOME INPUT IN DYNAMO PLAYER

OFFSET CURVE FROM EDGE OF SLAB BY "1"" NOTE: SLIDERS BECOME INPUT IN DYNAMO PLAYER

DYNAMO PLAYER

PLAN VIEW BEFORE

PLAN VIEW AFTER

STEP 1: OPEN FILE "ALIGN_OFFSET_START.RVT". OPEN NEW DYNAMO, ADD NODES, AND SAVE
STEP 2: OPEN DYNAMO PLAYER AND NAVIGATE TO FOLDER WITH DYN FILE
STEP 3: SELECT THE "EDIT INPUTS" ON PLAYER, SELECT SLAB EDGE AND BEAM AND CLICK RUN

MARCELLO SGAMBELLURI
namespace My_LIBRARY_FOLDER
{
  public class Dynamo_Geometry
  {
    private Dynamo_Geometry()
    {
    }
    public static Autodesk.DesignScript.Geometry.Point dszPoint
      (double inX = 1, double inY = 1, double inZ = 1)
    {
      // Autodesk.DesignScript.Geometry.Point is a Dynamo point
      Autodesk.DesignScript.Geometry.Point dpt =
      return dpt;
    }
  }
}

OPEN VISUAL STUDIO FOLDER "CREATE_DYNAMO_POINT_START" OPEN BLN FILE.
TYPE CODE AS SHOWN, BUILD THE SOLUTION.
OPEN DYNOMO AND START A NEW FILE, LOAD THE DLL FROM BIN FOLDER
ADD NODES AS SHOWN, OPEN "FINAL" FILE FOLDER IF NEEDED, NOTE VALUE IS ALWAYS IN DECIMAL FEET.
CREATE A COW IN DYNAMO WITH MULTIPLE OUTPUT PORTS

```python
// SETTING UP MULTIPLE RETURN TAGS

[MultiReturn(["leftbody", "leftleg", "rightbody", "rightleg", "lefteye", "righteye", "leftnose", "rightnose")])

// RETUR ANDING
Dictionary<string, object> outInfo = 
new Dictionary<string, object>()
{
    {"leftbody", leftBody},
    {"leftleg", leftLeg},
    {"rightbody", rightBody},
    {"rightleg", rightLeg},
    {"lefteye", leftEye},
    {"righteye", rightEye},
    {"leftnose", leftNose},
    {"rightnose", rightNose},
};

return outInfo;
```

Zero Touch for Dynamo COW 2019

---

**DYNAMIC GEOMETRY AND CODE NOTES**

CREATE A COW IN DYNAMO WITH MULTIPLE OUTPUT PORTS

- **RETURNING**
  Dictionary<string, object> outInfo =
  new Dictionary<string, object>()
  {
      {"leftbody", leftBody},
      {"leftleg", leftLeg},
      {"rightbody", rightBody},
      {"rightleg", rightLeg},
      {"lefteye", leftEye},
      {"righteye", rightEye},
      {"leftnose", leftNose},
      {"rightnose", rightNose},
  };
  return outInfo;

---

**YOUR ZEROTHOUCH_LIBRARY**

- **MY_LIBRARY_FOLDER**
  - **Dynamo Geometry**
    - **DynamoCow**

---

**DYNAMO NODES**

- **OPEN VISUAL STUDIO FOLDER “CREATE_DYNAMO_COW_FINAL” OPEN SLN FILE**
- **TYPE CODE AS SHOWN, BUILD THE SOLUTION**
- **OPEN DYNAMO AND START A NEW FILE, LOAD THE DLL FROM BIN FOLDER**
- **ADD NODES AS SHOWN, OPEN “FINAL” FILE FOLDER IF NEEDED. NOTE VALUE IS ALWAYS IN DECIMAL FEET**

---

**STEPS & NOTES**
GET ETABS FRAME LENGTHS AND AREAS

STEPS: 1. OPEN ANY ETABS MODEL "ETABS_GET_FRAME_AREA_LENGTHS_FINAL.EDB"
2. OPEN DYNAMO AND ADD THE NODES ABOVE

NOTES: 1. BEST IF DYNAMO FOR ETABS IS RUN IN MANUAL- READ NODE IF ITS NOT UPDATING
2. DONT FORGET TO USE ALL THOSE OTHER DOIB DYNAMO NODES TO HELP YOU
GET ETABS ANALYSIS FRAME RESULTS

CASE TYPE "1" IS ENUM + LINEAR

GET LOAD CASES FROM ETABS FILE

SEPARATES LOAD CASE TO BE DISPLAYED (DEADSELF) IN THIS CASE

DISPLAYS OUTPUT LOAD CASE

CREATE AN EMPTY LIST IF NO LOAD COMBO OUTPUT IS DESIRED

DISPLAYS OUTPUT MOMENT IN STRONG DIR. UNITS = LB-IN

VIA DYNAMO CONVERT UNITS TO K-FT

STEPs: 1. OPEN ETABS "ETABS_GEOMETRY_ANALYTICS_FINAL.EDB" AND RUN ANALYSIS
2. AND OPEN DYNAMO AND ADD THE NODES ABOVE

NOTES: 1. RESULTS SHOW LOad CASE OR LOAD COMBO ALSO NOTE UNITS ARE IN LB-IN
2. IF THE NODE DOES NOT UPDATE PLACE A NEW NODE ON CANVAS
SAP GET LENGTHS OF ALL FRAMES

These nodes get all the frames and names and pt names

These nodes get xyz of sap points

These nodes creates dynamo points from x,y,z input

This node gets cdys name

This node creates dynamo lines by start + end points

Steps:
1. Open any ETABS model "QM_FINAL.slb" and open dynamo
2. Add the nodes above

Notes:
1. Best if dynamo for ETABS is run in manual- read node if its not updating
2. Don't forget to use all those other python dynamo nodes to help you
Connecting Dynamo with RAM via API 2018

CREATE GRIDS IN RAM FROM REVIT USING DYNAMO VIA RAM API AND C#

**Steps & Notes:**
- **Step 1:** Open Visual Studio folder "Revit_to_RAM_Grid" and open SLN file.
- **Step 2:** Open Revit file "Revit_to_RAM_Grid_Start.rvt" and open Dynamo for Revit.
- **Step 3:** Load DLL. Select the RAM file "Revit_to_RAM_Grid_Start.rvt".

**Note:** RAM does not need to be open. See Source Package and RAM API Manual.
<table>
<thead>
<tr>
<th>LEARN HOW TO GET YOUR REVIT FAMILIES TO MOVE IN THE AUTODESK STINGRAY GAME ENGINE (CLASS PROPOSAL 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REVIT FAMILY</td>
</tr>
<tr>
<td>STINGRAY UNIT EDITOR</td>
</tr>
<tr>
<td>STINGRAY GAME ENGINE</td>
</tr>
</tbody>
</table>

**NOTE:**
The typical workflow is Revit to Stingray; some families require Revit to 3DSmax to Stingray.
8 Years' Worth of Dynamo and Revit Classes BY Marcello Sgambelluri

Game Engines for Engineers-See Something Say Something Part 2 2018

DEPLOY REVIT PROJECTS VIA ENSCAPE

1. REVIT TO ENSCAPE
OPEN REVIT AND GO TO A 3D VIEW
CLICK ON ADDINS
CLICK ON ENSCAPE
CLICK ON START

REVIT MODEL

ZOOMED IN VIEW

THE REASON TO CREATE A STANDALOG .EXE FILE IS TO SHARE WITH OTHERS YOUR ENSCAPE SCENE. THE EXE FILE COULD BE OPENED BY OTHERS WHO DO NOT HAVE ENSCAPE. NOTE THAT IT TAKES A LOT OF COMPUTER RESOURCES TO VIEW THE STAND ALONG EXE FILE FROM ENSCAPE AND SOME PEOPLE MAY NOT BE ABLE TO OPEN OR VIEW THE .EXE FILE.
Access the slide layouts for this template on the Home tab under Slides/Layout.

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- **ADSK blue**
  - R 6 G 150 B 215
  - HEX: 0696D7

- **Gray**
  - R 102 G 102 B 102
  - HEX: 666666

- **White**
  - R 255 G 255 B 255
  - HEX: FFFFFF

- **Dark blue**
  - R 24 G 88 B 168
  - HEX: 1858A8

- **Orange**
  - R 250 G 162 B 27
  - HEX: FAA21B

AU Resources

- Branding and editorial guidelines – Autodesk [Brand Hub](#)