Adaptive components are an adaptation of the pattern-based curtain panel. For example, adaptive components could be used in repeating systems generated by arraying multiple components that conform to user-defined constraints.

Adaptive points are created by modifying reference points. The geometry drawn by snapping to these flexible points results in an adaptive component. Adaptive components can be used in pattern panel families, adaptive component families, conceptual massing environment, and projects.

In this example I need a custom truss curtain wall. I am going to create this with a Mass object and a Pattern Based Adaptive component in the areas that are circled.

Pick on the Massing & Site tab>Conceptual Mass panel>In-Place Mass.

Name it Curtain Wall.
Pick from the Create tab>Work Plane>Set and pick the face of the wall.

Draw 2 lines one on the bottom of the opening and one on the top on the opening. You can draw one on the bottom the copy it.

Pick the 2 lines, and pick from the Form panel>Create Form>Solid Form. Pick from the possible forms, surface type.

Select the Form and pick from the Divide panel>Divide Surface.
From the options bar for the U Grid type in 6 and for the V Grid type in 5.

Repeat for the other wall.

From the application menu pick New> Family.

Select template, Generic Model Pattern Based.rft., click Open.

Select the Tile pattern Grid, this is the blue grid in the drawing area. From Properties type list you have a list of patterns to choose from. Select Rectangle pattern.

Next is to create glass for the curtain wall. Pick the reference lines. Pick from the Form panel> Create Form.
From the possible forms, pick Solid form.

Pick on the top surface and pick on the temporary dimension and type in 1/8”. This can also be done from Properties, under Constraints, Positive Offset.

Pick on this form and in Properties, under Materials and Finishes group, change the material to Glass. Pick OK to close the Material Browser.

You can change the visual style to Shaded to see the glass.
Pick on the form and from Temporary Hide/Isolate, choose Hide Element.

Pick from the Create tab>Draw panel>Reference>Point Element and pick on the Reference line to place the Point Element. Pick on the point, this will set the work plane on the point. Pick from the Create tab>Draw panel>Reference>Circle and draw a circle of 2” radius. Pick on the circle and pick on the dimension symbol to make it a permanent dimension.

Pick on the 2” radius dimension of the circle and from the Options bar, pick Add Parameter next to Label.

For the name type in Frame Radius and pick Type for the parameter. Pick OK.

Select the Circle and the Reference Lines, hold down Ctrl to select. From the Form Panel, pick Create Form and choose Solid Form.

Pick on the Tile pattern grid the change the Horizontal and Vertical spacing to 20'-0". This is important to test the geometry. Put it back to 10'.
Pick on the Form and from Temporary Hide/Isolate, choose Hide Element from the View Control Bar. You can change scale from 1/8"=1'-0" to 1/4"=1'-0" from the View Control Bar. This will allow you to better read the dimensions.

Pick from the Create tab>Draw panel>Reference>line and Draw Face is on. From the Options bar, the Placement Plane is Level 1 and 3D Snapping is on.

![Placement Plane: Level 1](image)

Draw a Reference Line from Adaptive Point 1 to Adaptive Point 3. Make sure to snap to the Adaptive Points and not the Reference Lines.

![Reference Line](image)

Pick from the Create tab>Draw panel>Reference>Point Element add draw a Reference Point on the diagonal line. Pick on the Reference Point and in Properties, under Dimensions group, change the Normalized Curve Parameter to .5. This places to point on the midpoint of the line.

![Normalized Curve Parameter](image)

Pick on the point to set the work plane.

Pick from the Create tab>Draw panel>Reference>Line and make sure Draw on Face is on. Turn off 3D Snapping from the options bar.

![3D Snapping](image)

Draw a Reference line straight down 6’ from the Point Element.
Pick from the Create tab > Work Plane panel > Set and pick on the diagonal Reference Line. Draw a dimension from Reference point 2 to Reference point 3. Pick on the dimension, from the options bar Label drop down select, <Add parameter…>, for the name type Diagonal, Instance on and check on Reported Parameter. Reported Parameter will report back the length of in Diagonal line. Click OK.

Pick on the blue Tile pattern grid the change the Horizontal and Vertical spacing to 20'-0". This is important to test the geometry. Put it back to 10'-0".

Pick on the 6'-0" offset Reference Line and pick on the dimension symbol to make it a permanent dimension. Pick on the dimension, from the options bar Label drop down select, <Add parameter…>, for the name type Offset, Instance on only.
Pick from the Create tab>Properties panel>Family Types.

Next to Offset, Formula column type: Diagonal/3. The Offset value now has changed. Click OK.

Pick from the Create tab>Draw panel>Reference>Line, draw on Face is on, from the Option bar Placement Plane is Level 1, 3D Snapping is on. Draw a Reference Line from Reference Point 1 to the end of the offset line and then to Reference Point 3.
Repeat this to draw a Reference line from Reference Point 2 to the end of the offset line and then to Reference Point 4. What you should see is on Pyramid of Reference Lines.

Pick from the Create tab>Draw panel>Reference>Point Element, draw a Reference Point on two of the Pyramid Reference Lines.

Pick on one of the Reference points to set the Work Place on that point. Draw a Reference Circle of 2” radius on the point. Repeat this on the other Reference point. Pick on one of the circles and pick on the dimension symbol to make it a permanent dimension. Repeat with the other circle. Hold down Ctrl on your keyboard and pick on both dimensions, from the options bar Label drop down select, <Add parameter…>, for the name type Truss Radius, pick Type for the parameter. Pick OK.
Select one of the circles and 2 Reference lines, be sure to hold down Ctrl on your keyboard when selecting. Choose the circle first when selecting to make it easier to pick.

From the Form Panel pick Create Form>Solid Form.
Repeat this with the other circle and the 2 Reference Lines.

Pick on the Tile pattern grid and in Properties change the Horizontal and Vertical spacing to 20'-0". This is important to test the geometry. Put it back to 10'-0"

From the View Control bar, Reset Temporary Hide/Isolate.

Pick from the Create tab>Properties panel>Family Types.

Change the Truss Radius to 1". Pick OK.

Save this family and from the Family Editor panel pick Load into the Curtain Wall project.

Pick, Default 3D View from the quick access toolbar.
Pick on Divided Surface Wall on the smaller wall. From Properties type list pick on the Truss family.

Pick on Divided Surface Wall on the other wall and pick on the arrow at the corner of the Surface Representation panel.

Turn on Nodes from the Surface tab. Click OK.

This family is found on the Project Browser under Generic Models.
From the Project Browser, click and drag the Truss Curtain family and pick 4 nodes on the divided surface.

Pick on the Truss family. Pick from the Modify|Generic Models tab> Modify panel>Repeat. This will copy the family to all the other grids.

Pick on the Divided Surface and change the U Grid Number to 10 and the V Grid to 10.

Pick on the Truss family and from Temporary Hide/Isolate , choose Hide Element.

From the Project Browser, click and drag the Truss Curtain family and pick the nodes on the divided surface to fill in between an empty area. Pick on the Truss family. Pick from the Modify|Generic Models tab> Modify panel>Repeat.

You can make a Generic Model Pattern Based, triangular (flat) adaptive family to fill in the triangular spaces.
Pick Finish Mass when done. In the project, turn off the Mass if needed.

About the Author: Veredith Keller

Veredith joined the IMAGINiT Technologies team in 2006, where she provides training, consulting and technical support for Revit Building, Revit Structure, Revit MEP, AutoCAD Architectural solutions, AutoCAD, 3ds Max, NavisWorks. Veredith offers IMAGINiT customers 16 years of technical expertise in software installation, customization, training, as well as small and large scale software implementation solutions.