AUTOGRAMMAR TUTORIAL

1. Loading the AutoGrammar menu in AutoCad

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4. AutoCad shortcuts

1. Loading the AutoGrammar menu in AutoCad

1.1. Create a folder called AutoGrammar in your directory and download the files in the AutoGrammar folder in Archnet's MIYAGI-MIT 2001 group (under collections)

1.2. Open AutoCad and click on the Tools menu in the menu bar. Choose Options. In the Options window, make sure the Files tab is selected.

1.3. Double click on Support File Search Path and then press the button Add on the right side. Click on the Browse button to open the Browse for Folder window.

1.4. In the Browse for Folder window, navigate to the AutoGrammar folder under your local or remote directory. Click on the OK button.
1.5. Check if the new path is showing under *Support File Search Path* and click on the *Apply* button on the bottom of the *Options* window. Then, click on the *OK* button. Now AutoCad will be able to find the AutoGrammar commands when you call them from the AutoGrammar menu.

1.6. From the command prompt line, type:

```
Command: (load "main"
```

(This function should load the AutoGrammar menu.)

1.8. Check to see if there is a new menu group on the left side of the menu bar on the top of your AutoCad screen. When you click on it, the *AutoGrammar* menu should have only 3 options.

If for some reason the *AutoGrammar* menu doesn't show up or an AutoCAD menu disappears, go to *Tools/Customize Menus*, click on the *Menu Bar* tab, find the group you are missing an option in the *Menu Group* drop box, and insert the menu you want with the Insert button.
2. Setting up AutoCad

AutoCad need to be set up first, so that we make sure that the units are in meters and we have enough space to draw.

2.1. Setting up the Drawing Units
2.2. Setting up the Drawing Limits and the Grid
2.3. Setting up the Viewpoint

2.1. Setting up the drawing units

From the command prompt line, type:

Command: units

Or click on the Format menu on the menu bar and choose Units...

Open on the Type list and choose Decimal. Click on the OK button.

2.2. Setting up the drawing limits and the grid
From the command prompt line, type:

Command: `limits`

Or click on the `Format` menu on the menu bar and choose `Drawing Limits`. There will be no dialogue box window. Look at the command prompt area and type, followed by enter:

Specify lower left corner [ON/OFF]<0.00,0.00>: 0,0
Specify upper right corner<12.0,9.0>: 100,100

To turn on the grid, type:

Command: `grid`
Specify grid spacing[ON/OFF]<1>: 10

Or click on the `Format` menu on the menu bar and choose `Drafting Settings`. Click on the `Snap and Grid` tab. Check the `Grid On` box on the top right side and set the grid's X and Y spacings to 10.

2.3. Setting up the viewpoint

Click on the `View` menu on the menu bar and choose `3DViews` and then one of the `Isometric` views (like NE Isometric).

Now you can start drafting.

3. Guided Exercise

3.1. Drawing a shape
3.2. Inserting a Registration Mark
3.3. One Shape Rule
3.4. Two Shapes Rule
3.5. Changing shapes
3.1. Drawing a cube

Click on the **Draw** menu on the menu bar and choose **Solids** and then **Box**. At the prompt...

```
Specify corner of box or [CEnter]<0,0,0>:
```

...click on any point on the screen. Then, type the following always followed by enter at the next prompts:

```
Specify corner or [Cube/Length]: C
Specify length: 10
```

You should see a box on the screen now.

3.2. Insert Registration Mark

From the **AutoGrammar** menu, choose **Insert Registration Mark**.

Use this command to insert an axis tripod in the shape to which you want to apply a transformation. This shape can be a single object (like a line, a point, a solid, etc.), or a group of objects.

The **Insert Registration Mark** dialogue box has a field for entering the **Length**, in drawing units, for the arms of the tripod. Enter a number big enough to be seen, but small enough to fit inside the shapes (e.g. 4).

It is better to apply the tripod to the corner of the object coincident with the label chosen during the labeling studies in 3dShaper, but avoiding superposing it with the object’s own lines, for clarity.
Click **OK** and then pick a point to insert the registration Mark, or just place it anywhere and move it later to the right place with the **MOVE** command (which can be typed in or found under the **Modify** menu).

After inserting the Registration Mark to the shape, copy both to the side, using the AutoCad command **COPY** (which can be typed in or found under the **Modify** menu).

Apply any number of transformations to this copy (rotation, scaling, translation, reflection). The AutoCad commands for those transformations are **ROTATE**, **ROTATE3D**, **SCALE**, **MOVE** and **MIRROR**, and they can also be typed in or found under the **Modify** menu. Position the copied and transformed shape and Registration Mark in the desired spatial relation to the original shape.

From the **View** menu, choose **Shade**, then **Flat Shaded, edges On**, and check if your cubes intersect each other. Go back to the wireframe view by clicking on the **View** menu again and choosing **Shade**, then **2D Wireframe**.

### 3.3. One Shape Rule

From the **AutoGrammar** menu, choose **One Shape**. Use this command to repeat a spatial relation between an object with a Registration Mark and a copy of them that has been transformed (moved,
rotated, scaled and/or reflected).

In the dialog box, check the radio buttons for **Explode** and for **Graded Color**. Type in 12 in the **Number of Iteractions** field.

(Please note that if you check the **Leave as Blocks** button you may not be able to run the program again until you explode and purge all the blocks.)

Click on the **Pick** buttons and click on each shape and registration mark. Type **enter** after clicking on the shapes, which can be made of many parts.

Click on the **OK** button and see how AutoGrammar repeats the original spatial relation to each block that is added consecutively.

To better see the result, click on the **View** menu and choose again **Shade**, then **Flat Shaded, edges On**. The composition should look like the one on the left.

Change the color of the two original blocks if needed, by clicking on them and choosing a different color from the **Color** list, under the menu bar on the top of the screen.

In the **View menu**, choose **3DOrbit** to examine the composition from different viewpoints.

3.4. Two Shapes Rule

First, click below to download a drawing ready to work on.

```
two_shapes_dwg
two_shapes_for14_dwg
```

Open the drawing and from the **AutoGrammar**
menu, choose **Two Shapes**.

Use this command to repeat a spatial relation between two different objects with Registration Marks and a copy of the first one positioned to the second according to the same spatial relation.

In the dialog box, check the radio buttons for Explode and for Graded Color. Type in 7 in the **Number of Iterations** field.

(Please note that if you check the **Leave as Blocks** button you may not be able to run the program again until you explode and purge all the blocks.)

Click on the **Pick** buttons and click on each shape and registration mark. Type **enter** after clicking on the shapes, which can be made of many parts.

Shape 2 and RM 2 should always be the ones in the middle. Click on the **OK** button and see how AutoGrammar repeats the original spatial relation to each block that is added consecutively.

You should obtain 4 different results in each computation.

### 3.5. Changing Shapes

We have finally arrived to the point at which AutoGrammar starts showing some advantage against other software to apply Shape Grammars rules. Here we will see how to make changes in the shapes that make the chosen spatial relation
and labeling.

You won't need to make changes to shape 1; just to shapes 2 and 3. But don't move the Registration Marks, or else the spatial relation will be changed.

Let's start by adding a flat surface to a curved one. First, download the following files:

to_change.dwg
to_change_for14.dwg

There are two arrangements of shapes with registration marks, ready for applying the AutoGrammar rules. Make a closed polyline, extrude and union it to the oblong.

Now make another one and union it to the pillar.

Apply the Two Shapes rule from the AutoGrammar menu. Each shape now should be replaced by the new one.
4. AutoCad short cuts

In AutoCad commands can be entered by 3 ways:

1) From the menu bar menus

2) From the Tool bar graphic buttons

3) By typing the command names in the command prompt area.

The last option can be used more efficiently if you learn some of AutoCad most used command's shortcuts: