

DIGITAL MEDIA | CMU SoA PRECOLLEGE 2019 | WEEK THREE

UNCANNY CALCULATORS: The computer is better at math than you are. It will gladly do your calculus homework. It eats calculus for breakfast. But when we work with a tool so complex, it's best to understand a bit more about how it works before we hand over a task that requires precision and decision-making. You learned a lot of things last week; let's break some of these processes down and interrogate the mechanics of the software and its geometry. This will improve your digital "hand" by giving you more control over what you model. We will use rigorous rules of geometry in an effort to reclaim some of the knowledge stored in these big dusty glowing boxes.

0717_MOVEMENT: It can be deceptively easy to move things in the three-dimensional world of Rhino. Especially with Gumball (beware the gumball!!). But for centuries, people have tried to describe and understand movement. We look for patterns in how everything moves through space and time. These flows occur in four dimensions, not three, and traces of movement are always left behind, if only visible through absence. How can we interrogate and represent these fleeting moments, of an object spinning through a void? Using your transformed solid from the week two TRANSFORMATIONS assignment, create a scene that demonstrates movement (dislocation, rotation, or spiral). Set up a perspective view that shows the original object, the moved object, construction lines to suggest movement type, and ground plane to give a horizon line. (Similar demo from past years can be found [here](#).) Pay attention during the in-class demonstration - not all information is listed below.

1. To [dislocate](#), use "Copy" and/or "Move".
 2. With End Osnaps turned on, draw a "Line" connecting a corner of the original object to the same corner of the copied object. Use "Copy" with the same Osnaps to add 3 to 5 additional construction lines.
 3. To [rotate](#), start by drawing the "Line" to act as your axis of rotation. Adjust length using "Scale" and position using "Move".
 4. "Rotate3d" with the option to Copy turned on, using the line you drew as your axis of rotation.
 5. Creating more construction lines, draw a "Circle" with option of 3Point initiated. Use necessary Osnaps to select a corner of the original object as the first point, and the same corner of the copied object as the second point. For your third point, initiate the Radius option and use your Perpendicular OSnap to find the center of the circle. Repeat 3 to 5 times; the circles should all be parallel to each other when you are done, if your geometry is correct.
 6. Use "Trim" with both original and copied object selected to delete one side of each circle (be consistent with the side you pick), until you have a series of arcs.
 7. To [spiral](#), create a construction line using "Spiral". Your axis should be Vertical, start at one corner of your object,
 - and extend at least twice as high as your object. When prompted, change the number of turns to 1. When choosing your first start point, select another corner of your object. Choose the same point for your second point.
 8. "Offset" your spiraling line by the Distance from the spiral's points to the spiral's axis (should be able to snap to corners on your object, may need to use Project Osnap) and select option BothSides. This should create a similar larger spiral and a straight vertical line.
 9. "Rotate" your three construction lines if needed.
 10. Measure your "Length" of the first spiraling line from step 7.
 11. Create another "Line" with option Tangent. Start the first point snapping to the endpoint of the first spiraling line. Choose the end of the line using FromFirstPoint option and enter the dimension of the length from step 10.
 12. "Copy" original object once along the line from step 11.
 13. "Flow" this copied object; select line from step 11 near the starting point as your base curve; select the first spiral line (Rigid=Yes, Stretch=No) as your target.
- Check correct layers/settings.
 - Display mode to be Ghosted. Set up preferred perspective view.
 - Under PROPERTIES > VIEW > DISPLAY MODES > GHOSTED > TRANSPARENCY set @75% and uncheck SHOW ISOCURVES.
 - Open "Groundplane" properties and set TRANSPARENCY @85%
 - Print. OUTPUT TO IMAGE FILE (will save as jpg) > SIZE 18x24inches either orientation @ 200dpi B&W, default line set to hair

WHAT: The final output for this assignment consists of one jpg file (settings specified above). Sample file name for this assignment: wk3_perry_movement.jpg.

WHEN: Digital submission due at 8pm, July 17. To be printed by TAs before Thursday's Drawing class.

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0717_FIELD: Field conditions are established through the relationships between parts. This exercise will explore ways to permutate and aggregate, to turn object into field, using semi-automated processes in Rhino. The final image should be composed in such a way as to emphasize the field condition as field - pay attention to the placement of the camera and cropping.

1. In the front view, with Project Osnap turned on, draw a "Polyline" with PersistentClose. (Alternatively: You can use "Section" through one of your transformed objects from the TRANSFORMATION exercise; it is important that you have a single closed polyline for the next step.)
2. Create a "PlanarSrf" with your shape.
3. Draw a "Plane" 18x24inches in size.
4. Use "Move" or Gumball to carefully place your surface from step 2 on your plane from step 3.
5. "Array" surface from step 2, 8x12 with 2inch spacing.
6. Select the first row (short) and "BoxEdit":
 - Pivot Location X=Center, Y=Center, Z=Min
 - Use current CPlane
 - Transform objects individually
 - Show bounding box
 - Rotation: Z=15
 - Apply
7. Repeat, increasing Z rotation value by 15 degrees per row.
8. Now selecting by column (long) start with the second and "BoxEdit" (helps to "Group" by column before beginning):
 - Pivot Location X=Center, Y=Center, Z=Max
 - Use current CPlane
 - Transform objects individually
 - Show bounding box
 - Scale: Z=1.1
 - Apply
9. Repeat, increasing Z scale value by 0.1 per column (decreasing after you reach 1.5).
10. "Copy" the original surface off to the side and "Rebuild"(8x12, degree 3 for U and V).
11. Turn on "History".
12. Select your field of planes from step 5 and "FlowAlongSrf" (Copy and Rigid=Yes). Your plane from step 3 is your original surface and the rebuilt surface is your target.
13. Use Gumball to manipulate your new surface from 10. Turn off "History" when you have completed this step.
14. "Hide" original array'ed set and surface. Choose a suitable perspective ghosted view and save the view.
15. Follow print settings for MOVEMENT, but with 11x17inch final image.

WHAT: Final jpg at 11x17, sample file name wk3_perry_field.jpg.

WHEN: Digital submission due at 8pm, July 17.

0719_MONTAGE: Incorporating skills from the last three weeks, create a perspective section scene in Photoshop.

1. Start by placing one of your TRANSFORMATIONS objects into your FIELD. Position using Gumball until it is situated within landscape.
2. If necessary, "Trim" parts of your field of objects that intersect with your transformed solid.
3. Insert a vertical "ClippingPlane" that cuts through both field and object. (Shouldn't receive or cast shadows.)
4. Choose a suitable perspective view that highlights the qualities of your composition, set to render. Adjust lighting, material, and rendering settings as necessary.
5. Print to pdf with "vector" and render (or print Output to Image File with "raster"). Both to match submission sizes.
6. Open the pdf in Adobe Illustrator to modify lineweights, incorporate fills, and generally clean up the section cut. Save as ai file for future editing.
7. Open all in Photoshop. Incorporate scale figures, additional textures/backgrounds, etc. to generally create a sense of the space.

WHAT: Final jpg at 11x17, 200dpi, sample file name wk3_perry_montage.jpg.

WHEN: Digital submission due at 8pm, July 19.

0719_HYBRIDS: Your digital MOVEMENT exercise will be used in Drawing class this week, and worked over with analog media. Keep in mind some of the ideas about hybridity and mixed media discussed in class. Final image must be submitted by Friday night to receive credit for **both** classes. You must also include your full name written in pencil on the back side of the piece.

WHAT: **TA team to designate a place to turn in final physical pieces. Pieces to be photographed and uploaded to FILE SUBMIT by TA team.**

WHEN: Physical submission due at 8pm, July 19.

To avoid conflicts with your various other assignments, and to facilitate time for preparation of the exhibit this weekend, there is no option to resubmit Week Three assignments.