

ESP Training Sessions 7 & 8 (June 16, 2021)
Muddy Cards

I am building up a rotor blade, for which I have several airfoil sections at different stations and I'm curious what the best approach is for importing airfoil data files with the definitions
use UDPRIM fitcurve; examples are in data/basic/fitcurve*

Is it possible to create a WireBody by INTERSECTing two SolidBodys?
not at this time

When you SUBTRACT a SheetBody from a SolidBody (to score it), what kind of Body results?
the result is a SolidBody, whose Faces are scored by the SheetBody.

How do I make a SheetBody from a SolidBody?
use EXTRACT 0

It would be nice to have a SWAP command
see the swap.udc (in session06)

Why in a previous example do you use the "keep" option in STORE?
if you just want to add a copy of the latest Body on the stack, you have three options

1. STORE temp
RESTORE temp
RESTORE temp
2. STORE temp 0 1
RESTORE temp
3. RESTORE .

What are the " filename << " doing in the waffle UDPRIM?
when the filename is specified as <<, it means that a temporary file will be created (in memory) with all lines from the line following the << until a line starting with >>

In the sketcher example, you specified L=3 for the horizontal segment and L=2 for the vertical segment. Isn't this inconsistent?
No. Hitting L (length) in the sketcher is merely telling ESP to apply a length to this segment. The value of the length is the value provided in the pop-up, not (necessarily) L.

Are there any ESP community resources? E.g., Slack, mailing list, online forum, github site, etc.?
not at this time. For now, use email to jfdannen@syr.edu or haines@mit.edu and we'll try to respond promptly

If the sketcher seems to break on a particular script, do you want us to share it with you (the developers)? It's happened to me once.

absolutely. anytime you get an unexpected result and suspect that ESP is broken, you can send it to us. we will debug and make sure that ESP is fixed. BTW: there are over 2100 files in data/basic, many of which are cases that previously failed and which we want to make sure never fail again

Can you sketch a WireBody and EXTRUDE it to make a waffle?
you can certainly sketch a WireBody and then EXTRUDE it. but note that UDPRIM waffle has the added benefit of breaking crossing lines. so if you have two lines that cross in a waffle, 4 Faces will result

How do I find a list of Branches that produce a Body? (Maybe bold them or something in the GUI?)
all the Primitives, Grown, Applied, Boolean, Transforms, and the SKEND Branches create one or more Bodys (albeit, sometimes a modification of a previous Body)

Are there clues in the GUI that allow you to know what branch was responsible for what Body(s)?
if you click on the Body name in the TreeWindow, ESP will tell you in the MessageWindow the _brch that was responsible for creating the Body

What do the various Edge colors mean in ESP?
Edges are colored this way:
green: a manifold Edge that was first created as part of a primitive (such as the Edges in a BOX)
blue: a manifold Edge that was first created as part of a Boolean or Applied Branch
brown: a non-manifold Edge that supports only one Face
orange: a non-manifold Edge that supports more than two Faces

In the sketcher, can you reference a distance to a point on a curve (but not necessarily one of its endpoints)?
no, but often you can get the same results (especially for circular arcs) by manipulating the coordinates of its center

When I use '2' (or '@') to select a planar surface that I know should be exactly X, I don't get X but something close (and it changes with each click). Is there a way to force evaluation? E.g., combine '2' with some key modifier like shift or control or ...
How the "@" or "2" option works is by reading the graphics buffer (getting the x,y,z screen coordinates) and then inverse transforming them back to physical coordinates. The "accuracy" of this depends on the screen resolution, so the results you get are approximate. There is no plan on making a direct evaluation available in ESP.

When selecting in an area that has multiple possible topological

entities, e.g., near the corner of a box where you might want one of the faces, edges, or nodes, is there a way to cycle through the nearby choices?

Again, this is done by reading the buffer and determining which entity painted the pixel at the cursor. If you really need to determine an Edge or Node number, change the visibility of the nearby the Faces (and/or Edges)

Maybe it's already in there, but drag-select would be nice to have to be able to select multiple entities.

This has been requested once before, but it is not clear what operations would use the selection area and what the rules would be (anything fully in the box, partially in the box, ...) If a clear concise set of rules can be defined, we'll look into implementing it.

Can you send a message to the user from an OpenCSM script? E.g., something that would appear in the ESP output console and/or standard output.

Use the MESSAGE command, which is new to v1.19

It would be nice if I didn't have to memorize that syntax for UDPRIMS included in ESP

See the ESP_QuickReference and/or use the Hint button in the integrated .csm code editor

Is the 'W' (width) constraint the same as the 'L' (length) constraint length of a line segment if the line is horizontal? I am wondering why using width between two points in the bracket example leaves the sketch unable to solve.

The Width constraint can be placed between any two points (and not necessarily on the same line). If the Sketch cannot be solved, you probably have something else wrong.

INTERSEction needs at least one SolidBody. Can we find the INTERSEction of two SheetBody's somehow?

Yes. See the documentation for INTERSECT

What is the difference between .tParams and _tParams?

.tParams is an attribute that you set to control the tessellation on an Edge and/or Face. There are 3 numbers:
* the maximum distance between tessellation points
* the maximum distance between the midpoint of the arc and the midpoint of a chord on the segment between adjacent points
* the maximum angle change between adjacent segments on a Edge

_tParams is what was actually used. If you had set .tParams, they should be the same. If you didn't set .tParams, _tParams tells you what default values were used.

Remind me again where I can find help on the various commands.
If you press the Help button, section 5.4 lists all the commands. If you press on the name of the command, it will take you immediately to the help for the command.

What is the best way to make an assembly of parts?

You have three options:

1. write a single .csm file that contains all the parts
pros: simplest approach
cons: (potentially) very long script; parts cannot easily be reused
2. put each part in a separate .udc file and then write a .csm file that calls the UDCs via UDPRIM statements
pros: parts can easily be reused; reading the .udc files occurs only once (during load) and are simply re-executed during the build process
cons: in order to test the .udc files, a (temporary) .csm file must be written that calls it
(see data/basic/assembly3 and data/basic/assembly4 - in version 1.20)
3. put each part in a separate .csm file and then write another .csm file that calls the part files via the "csm UDP"
pros: parts can easily be reused; parts can be tested independently
cons: the part .csm is re-read each time it is executed (which might slow things down a bit); the part .csm files cannot be edited in the integrated editor when in the assembly
(see data/basic/assembly1 and data/basic/assembly2)