

**NE** **2010**  
**SWUC**

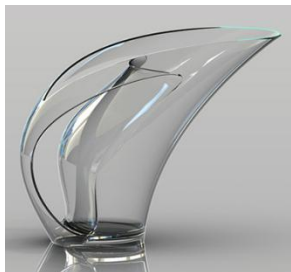


# *Unsung Heros of Surface Modeling*

presented by:

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&  
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**CAPINC**



# “Unsung Heros” are...



Surfacing commands, or command sequences that are;

- Not widely known
- Perhaps un-glamorous
- But get the job done
  - Sometimes better & cleaner (math or topology)
  - Sometimes quick-but-dirty - (think spackle)

# Boundary Surface



“The big three” for weaving across an opening:

**LOFT ----- Boundary Surface ----- FILL**

“The big three” for weaving across an opening:

## **LOFT** ----- **Boundary Surface** ----- **FILL**

- The grand-daddy of Surface commands
- Analytic – Accuracy First !
  - For Propellers, wings, boat hulls, etc
  - YOUR job to assure sections are ‘fair’
- Cross-Sections rule
  - All other inputs are over-loaded
- Strongly oriented surface flow
  - “U” iso-params det’d by section *spacing*
  - “V” iso-params det’d by section *structure*
- Finicky about sections/guides meeting

“The big three” for weaving across an opening:

**LOFT** ----- **Boundary Surface** ----- **FILL**

- Fills openings with any # of sides
- Smoothness – First !
- Outer boundaries rule
  - Inside pass-thru data - over-loaded
- ‘Forgives’ small edge gaps/errors
  - But then edge accuracy can suffer
  - Less robust with internal data
- No U/V surface flow control at all

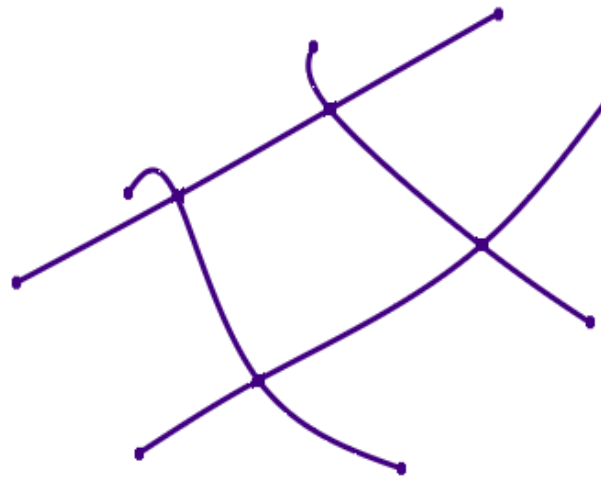
# Boundary Surface

“The big three” for weaving across an opening:

**LOFT** ----- **Boundary Surface** ----- **FILL**

New in 2007 – Not so widely used / Appreciated

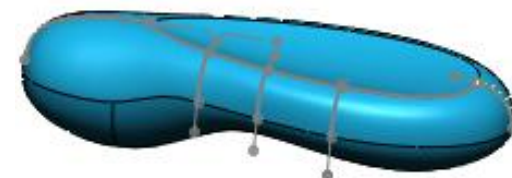
First, the Mechanics ...

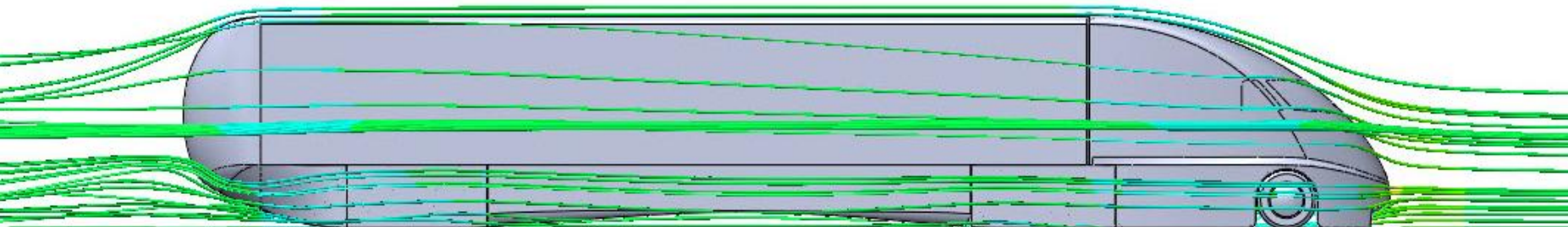


--- The weaving tool of first choice from now on ---

## LOFT ----- **Boundary Surface** ----- FILL

- Like LOFT, the sections DO orient U and V, but...
- Equal bias between U and V section directions
  - (Or, can override and flavor section influence)
  - Better behaved when sections don't quite meet
  - Smoother U-V flow, not slaved to section spacing
- Equal bias between sections and edge clamping
- Unlike Fill, will fabricate its outside edges
- Better than Sweep with non-orthogonal data
- Less finicky than Loft





60% Less Drag = 30% Better Mileage

2011 SuperTruck



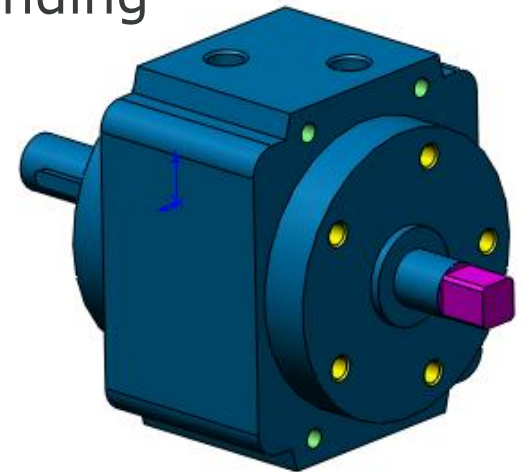
2015 FutureTruck



# Move / Delete Face – For Edits

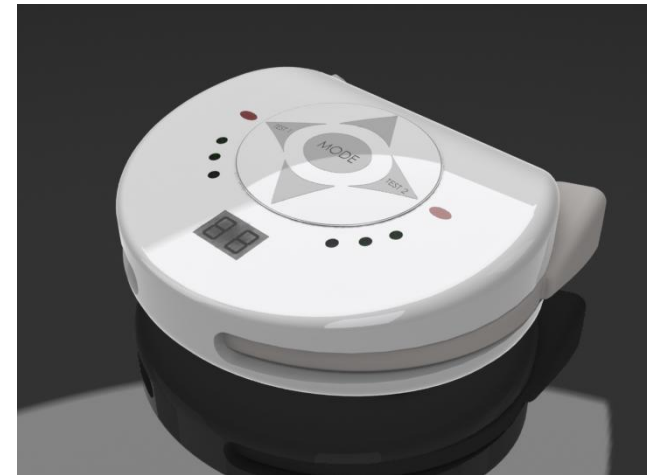
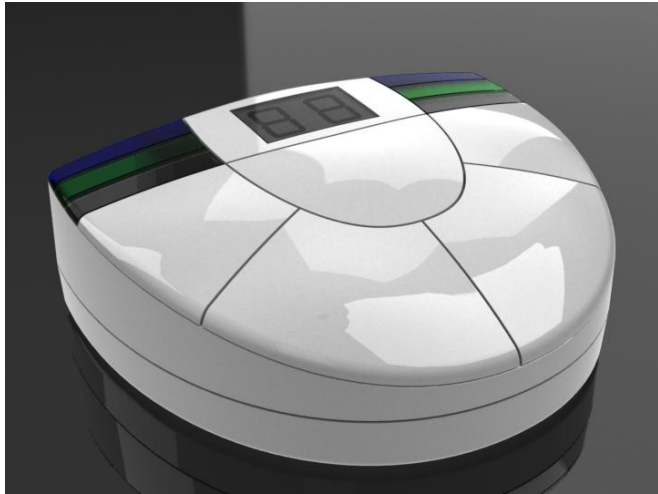
Make 'feature edits' when there are no features to be had !

- Some CAD systems tout this as "Direct Edit" , Or "Synchronous Editing"
- Although not 'parametric', this Solidworks operation is still a configurable, history-based feature
- *Delete Face* – can feel a lot like "Un-Do" for some features that are trimmed into the surrounding faces

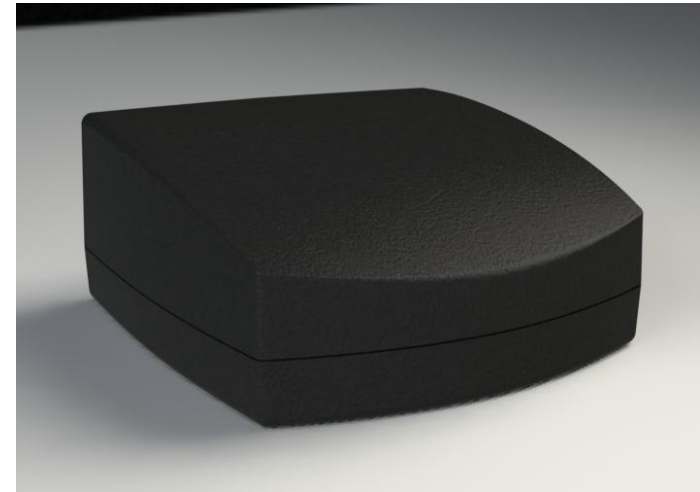
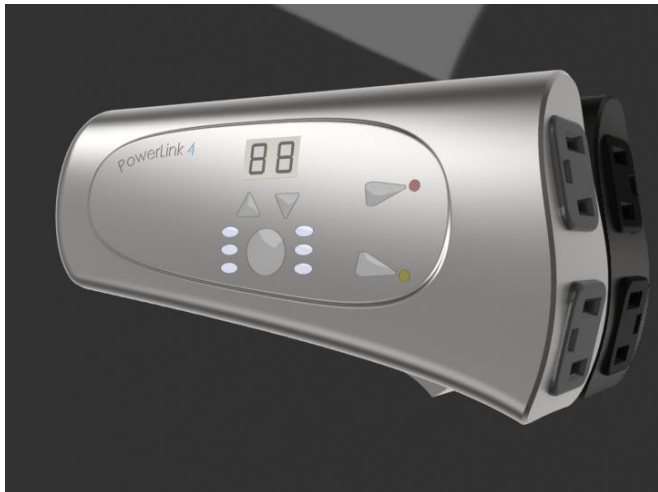


# Move Face

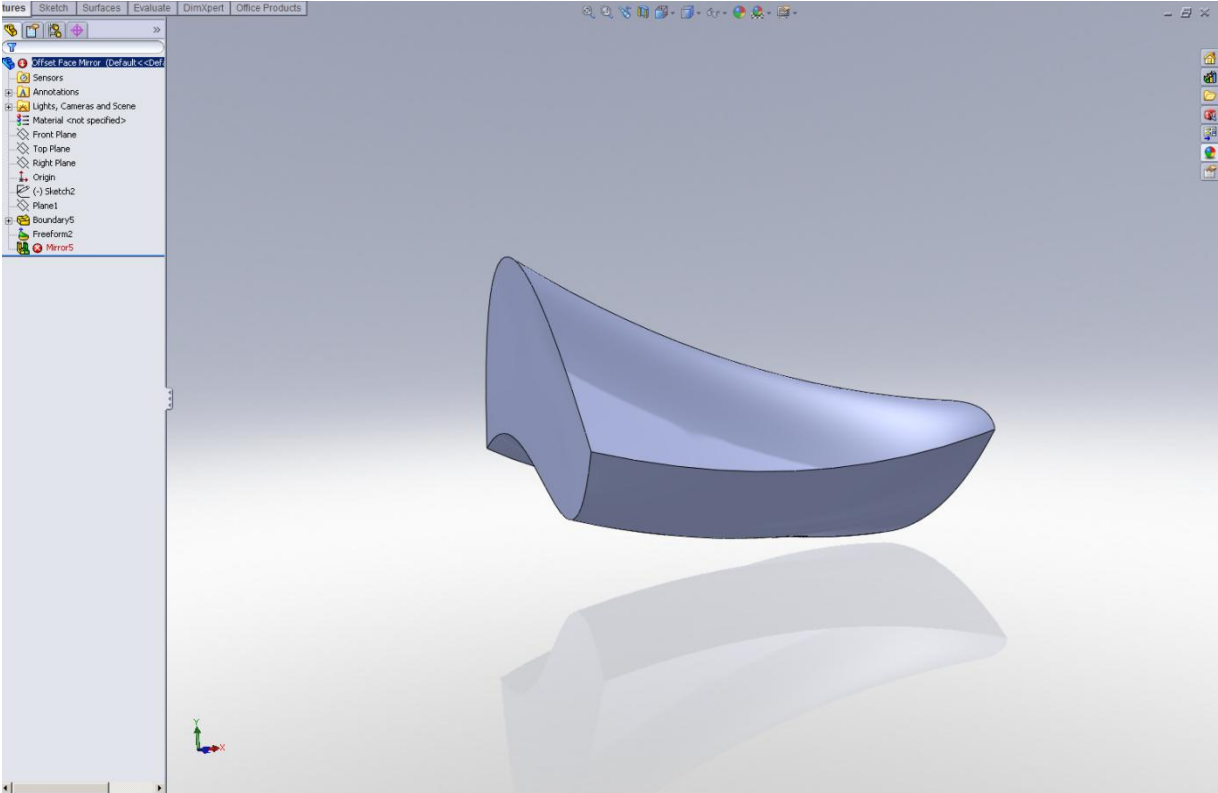




How we design 4 Concept Models in two days.



# Move Face



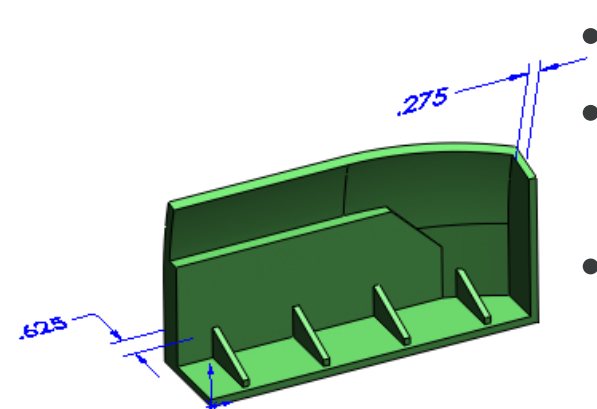
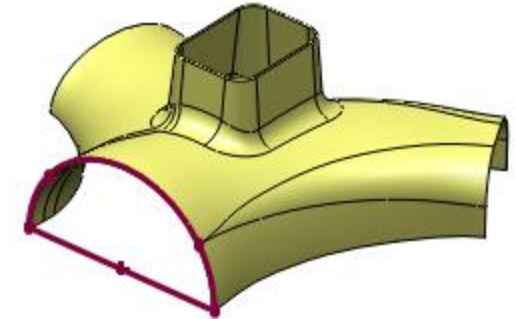
# Delete vs Offset Face

Delete Face (*FILL* option):

for Rip-n-Stitch technique

Delete Face (*PATCH* option):

for filing/plastering a mistake

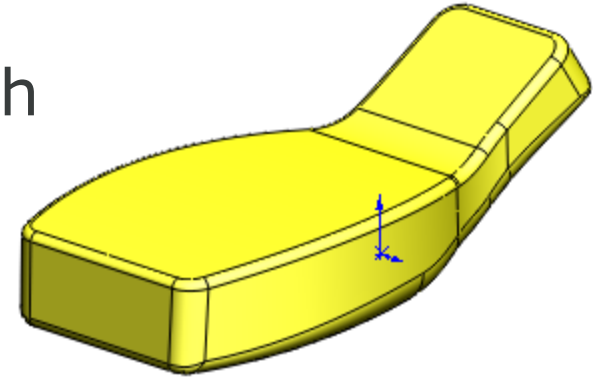


- BTW, a Zero-Offset == Copy Face
- *Delete Face* requires that you select every face that's bad..,
- *Cut – With Surface* only requires that you select the good, 'keeper' face(s) – so more robust rebuilds

# Replace Face

Much more powerful than Rip-n-Stitch

- Can both add and subtract
- Don't have to build 'in-place'
- New surface can be anything
  - Not just a single patch
  - Cobble together any #of commands/faces
- Caveat-where adding, neighboring faces need to be extensible
- Recover gracefully from an appalling lack of aesthetic clairvoyance...

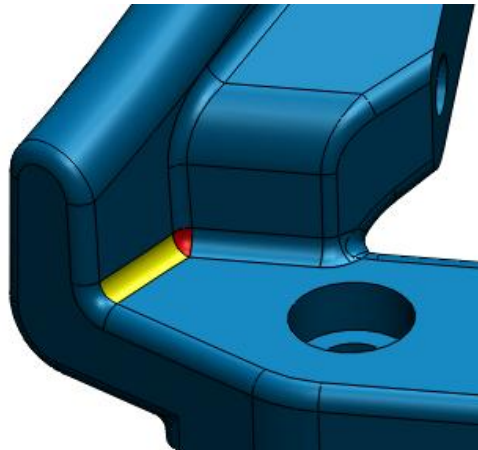


# Replace Face



Solidworks has no "Un-Knit" command

- But we *DO* have Replace Face
- So you just alter your workflow
  - Extract a copy of the neighboring faces
  - Re-work or build new against the copied surfaces
  - KNIT the reworked area together
  - REPLACE FACE the rework over the originals
  - The main body actually stays solid the whole time



# Using a Surface as a Split Tool

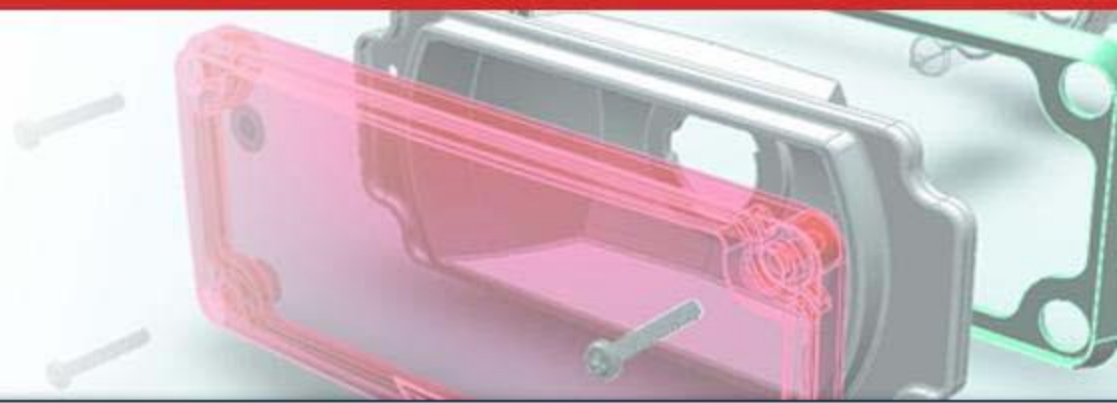
**CAP**INC



# Using a Surface as a Split Tool

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# *Questions ?*



**Jeremy Singley**  
&  
**Keith Pedersen**





*Thank You for attending...*

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Surface Modeling !***

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