

# Generative Design Masterclass

**James Neville**

Principal Business Consultant



# James Neville

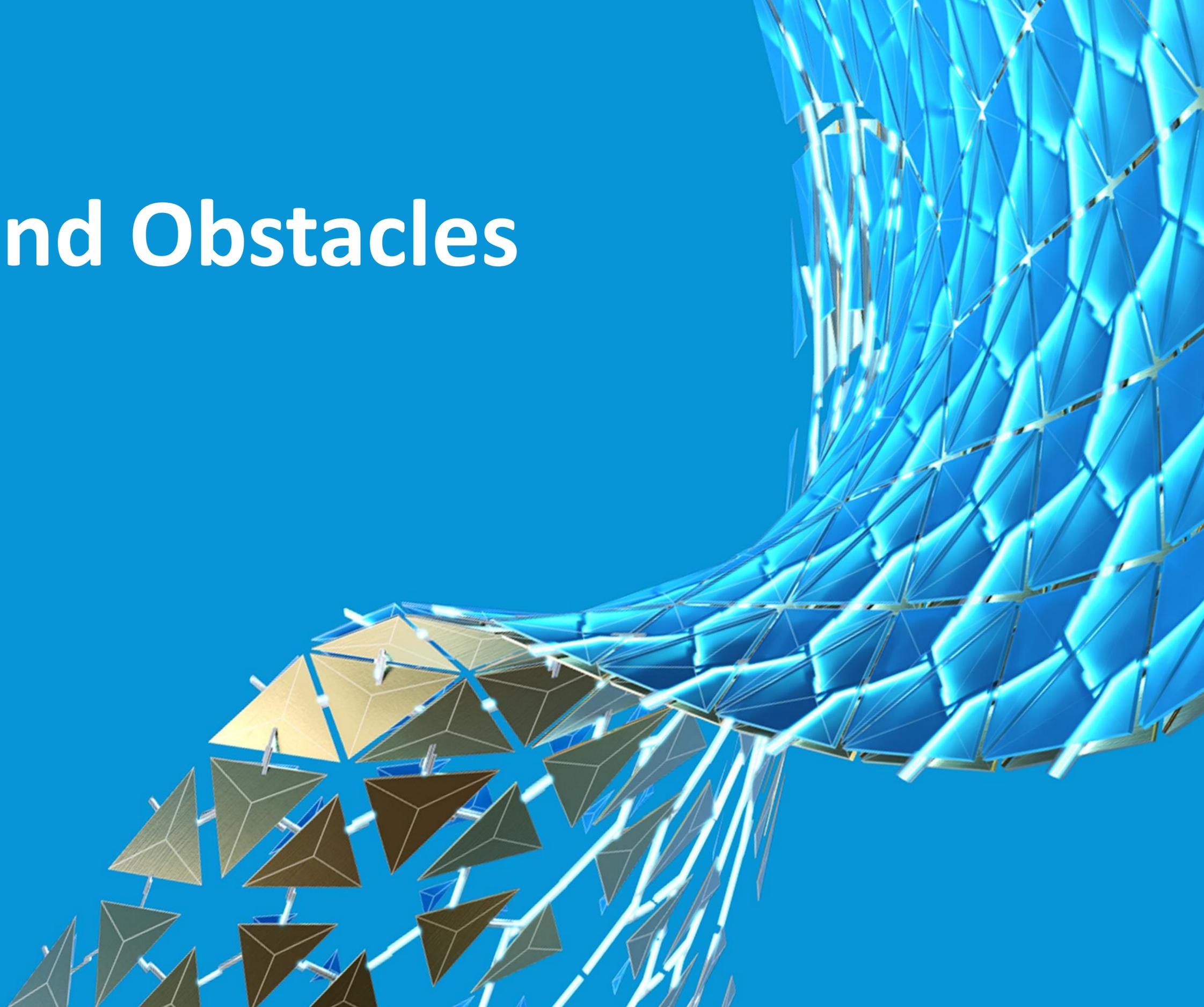
## “Simulation Guy”

- Principal Business Consultant for Autodesk Global Consulting Delivery
- Joined Autodesk in 2011 through the Blue Ridge Numerics Acquisition
- Special Projects
- Expert in CFD and Generative Design

# Agenda

- **Preserves and Obstacles**
- **Synthesis Resolution**
- **Starting Shapes**
- **T-Splines Tips**
- **Part Hollowing**

# Preserves and Obstacles

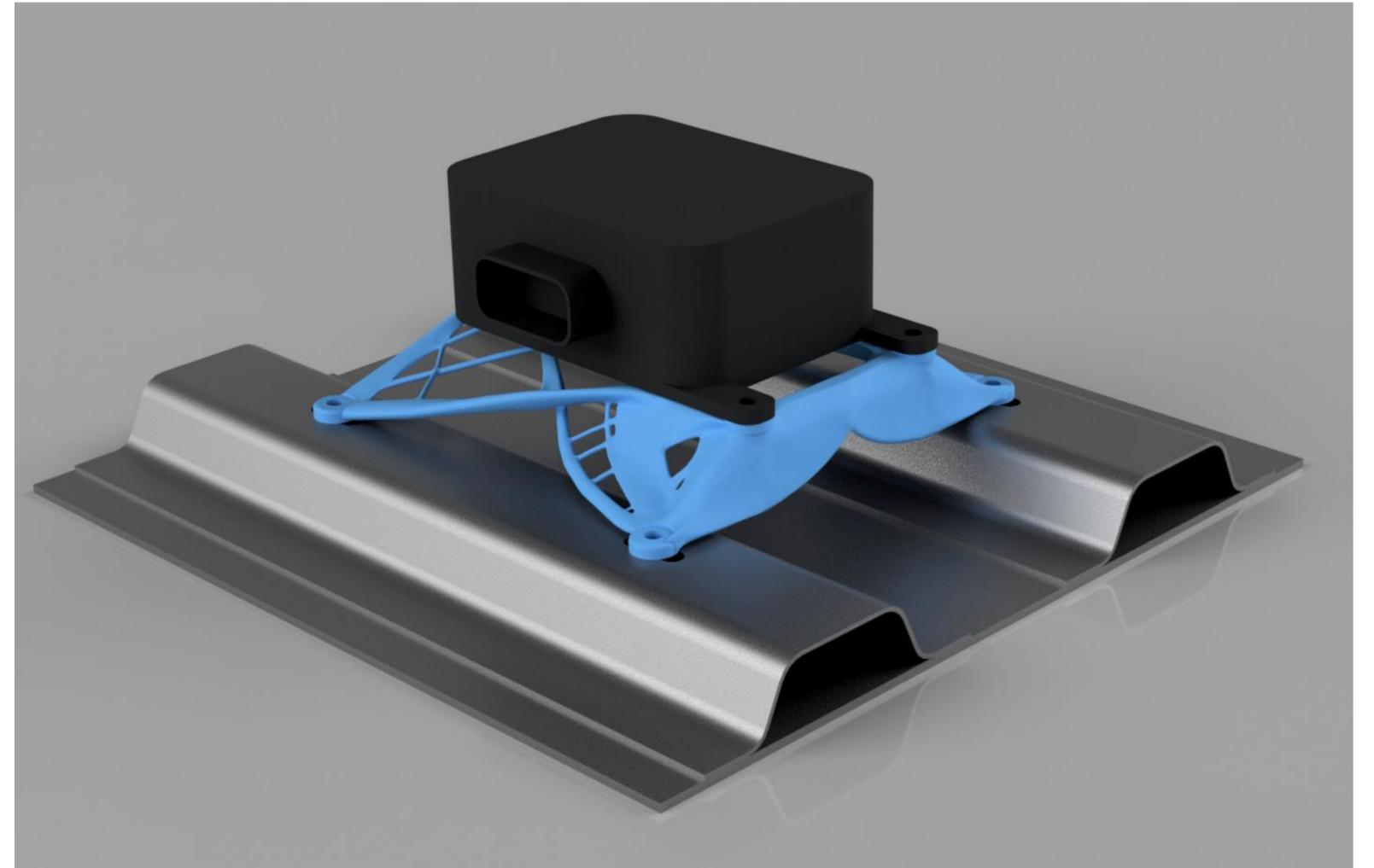


# Preserves and Obstacles

Generative design outcomes that involve form bodies tend to work best with rounded preserve and obstacle geometry

The transition between preserves and a form body is more robust and more accepting of post-processing when the preserve has been pre-filleted or rounded

Rounding obstacle geometry helps to avoid creases, interferences, and gives the generative design some “breathing room”

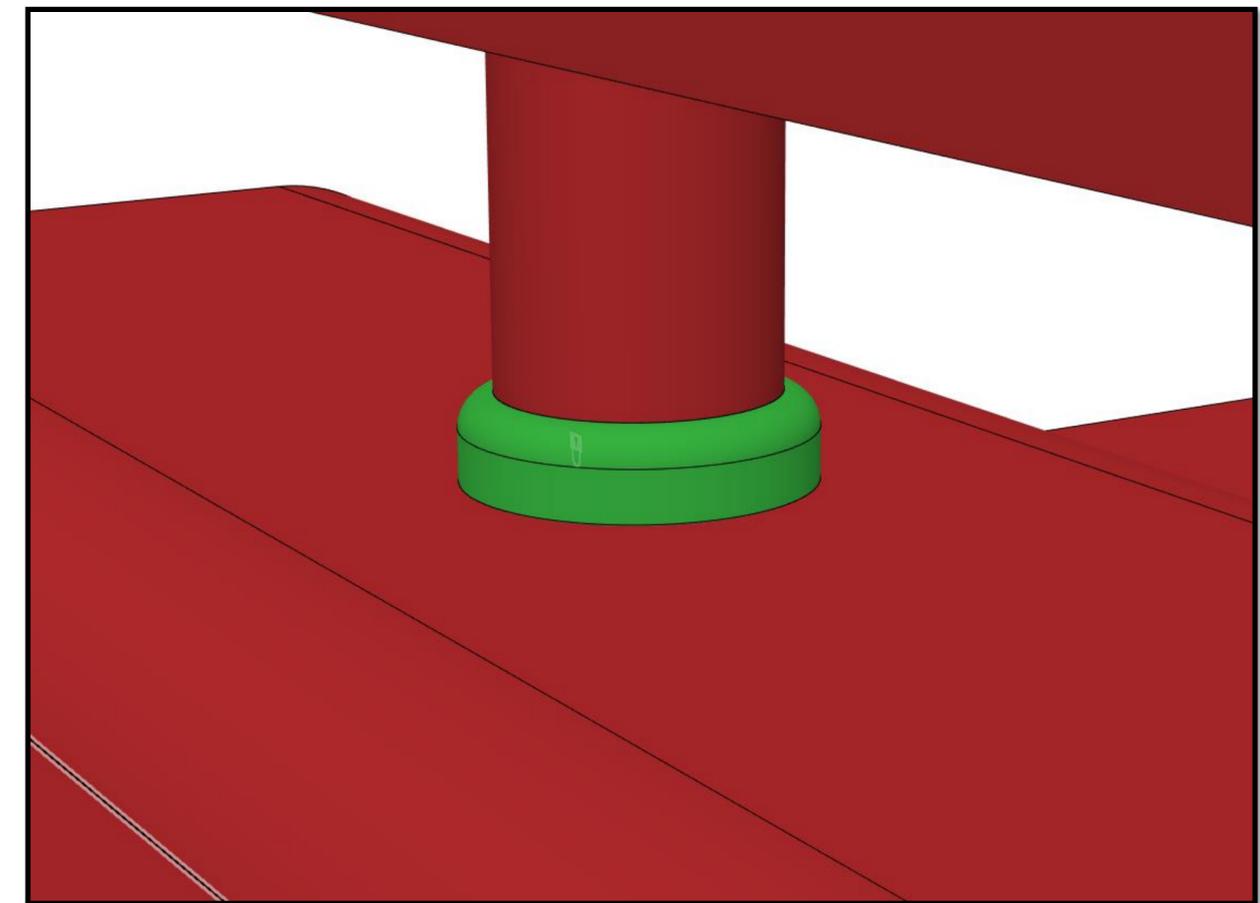
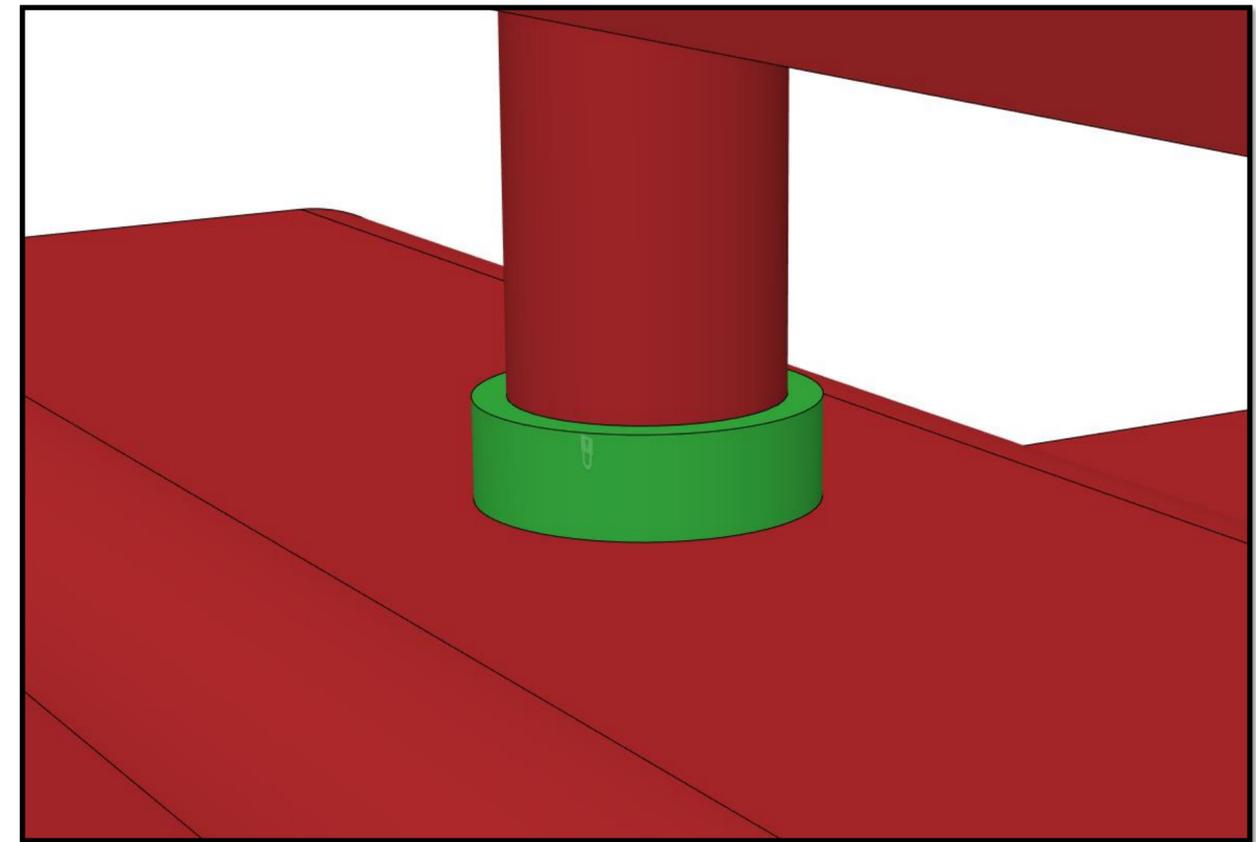


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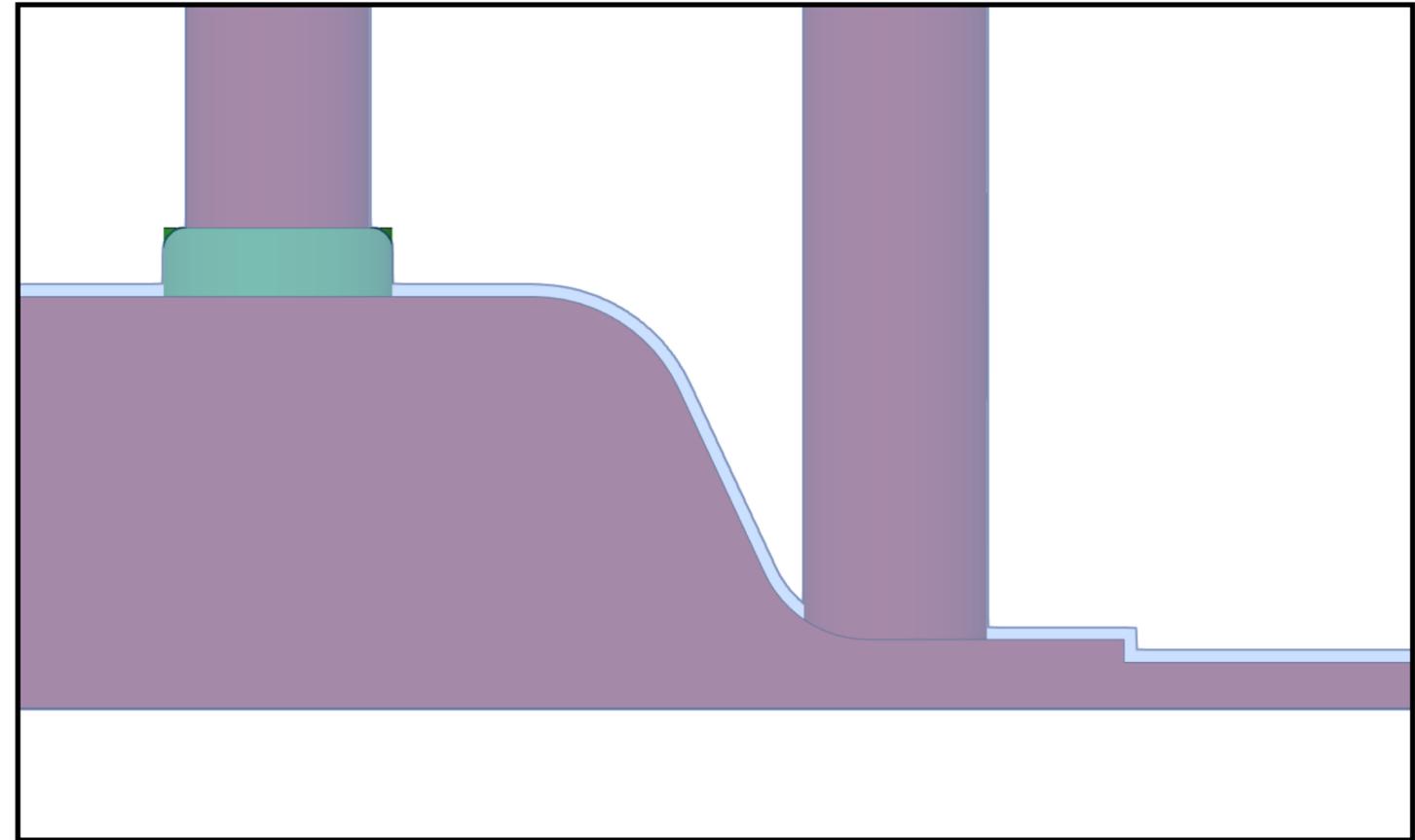
# Preserves and Obstacles

Restricting the design space available for a generative outcome can have its benefits

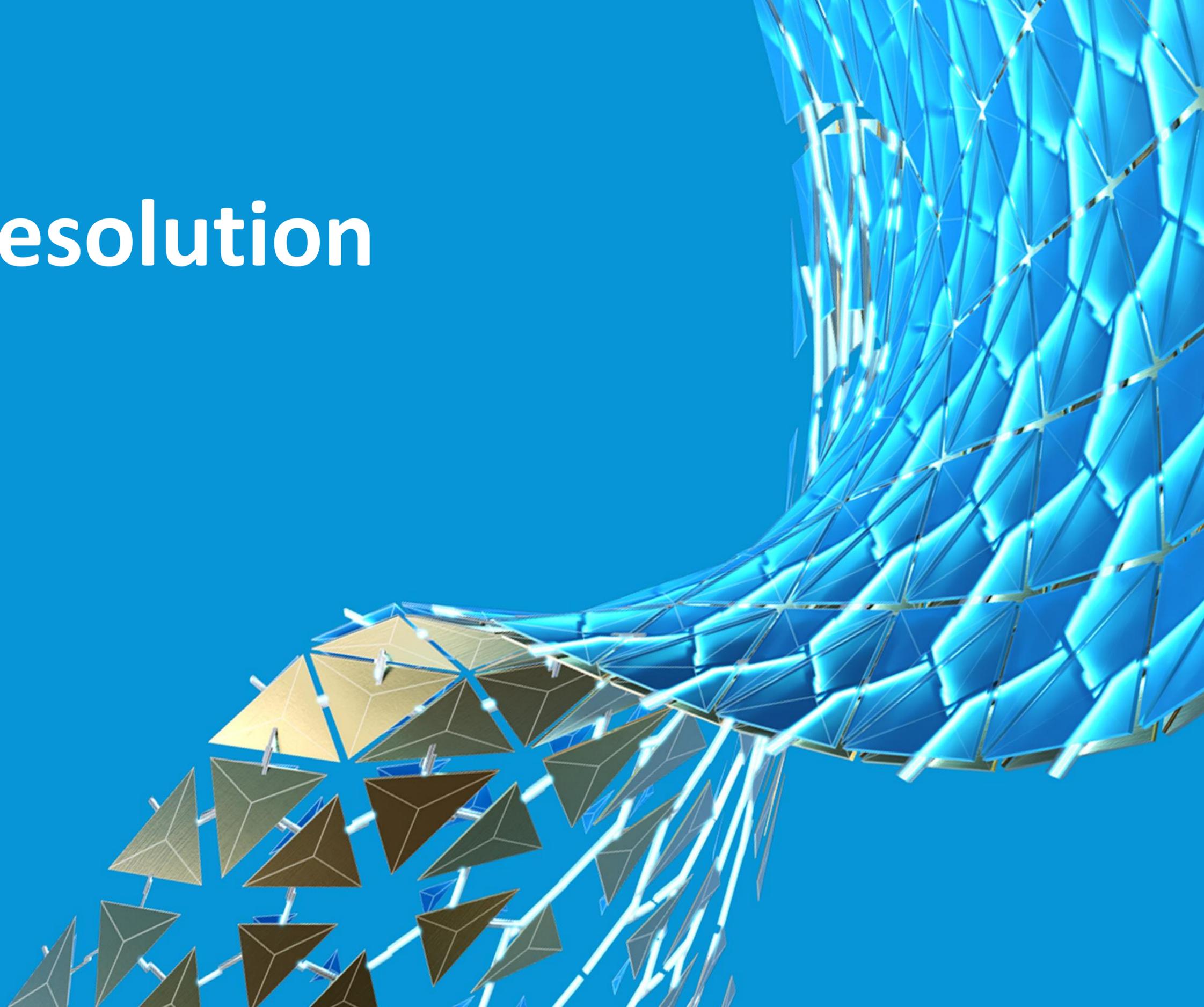
Eliminates the chance of unwanted contact with other components

Allows extra room for stress response and deflection

Upfront setup effort for obstacle offsets is faster and more elegant than post-processing an outcome



# Synthesis Resolution

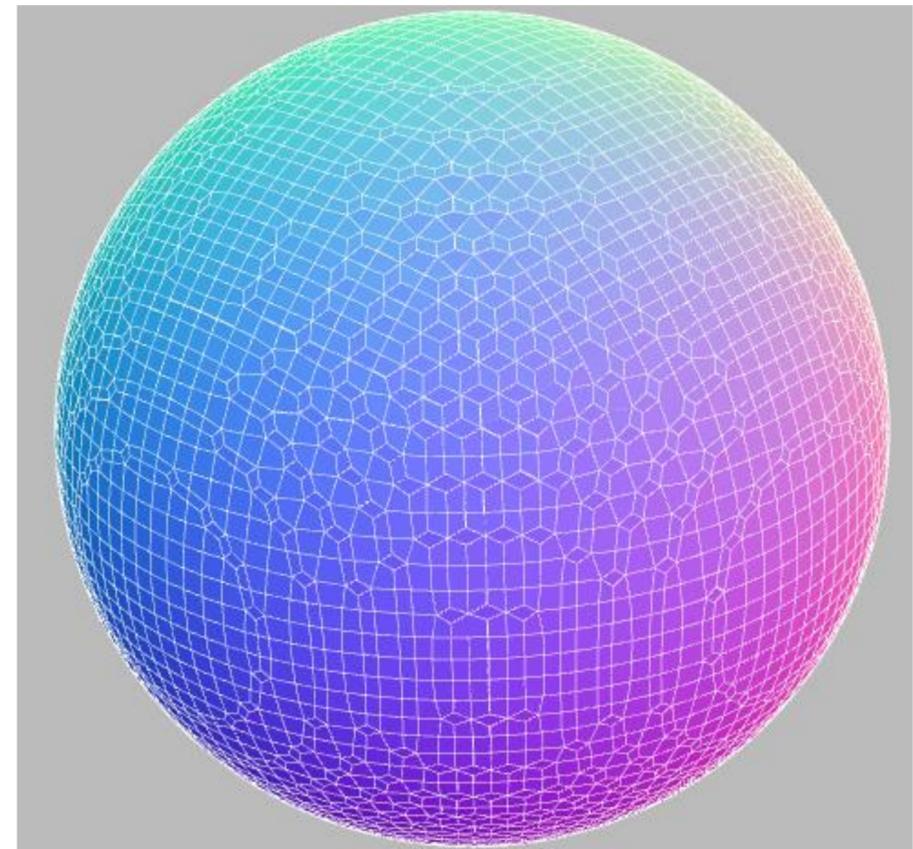
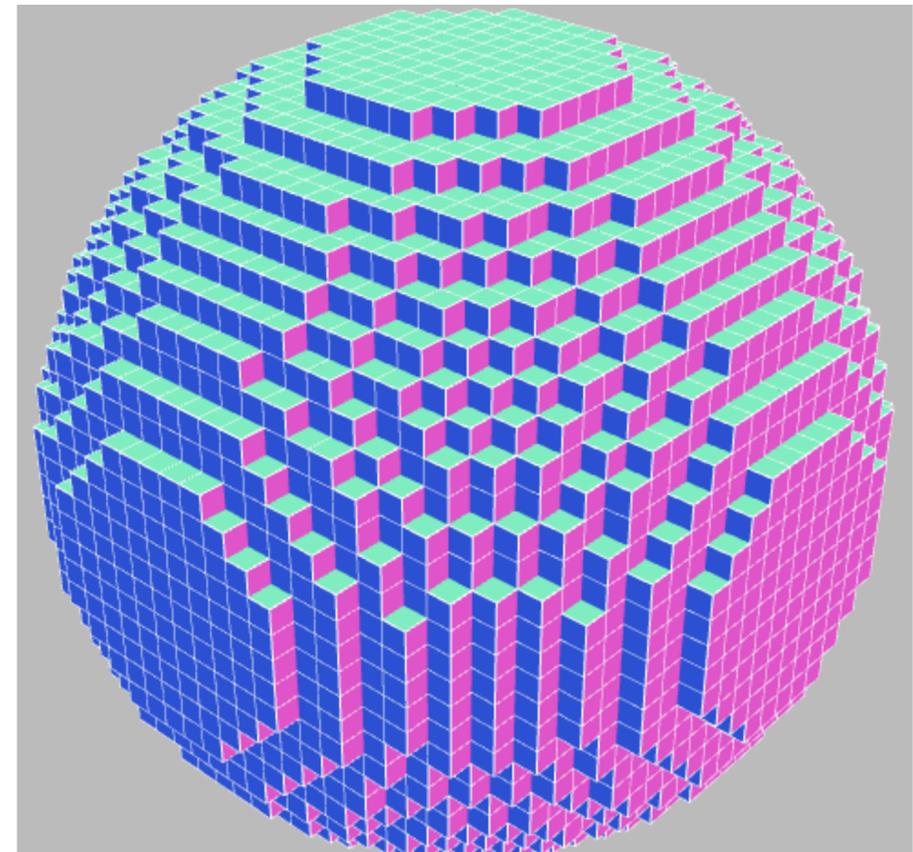


# Synthesis Resolution

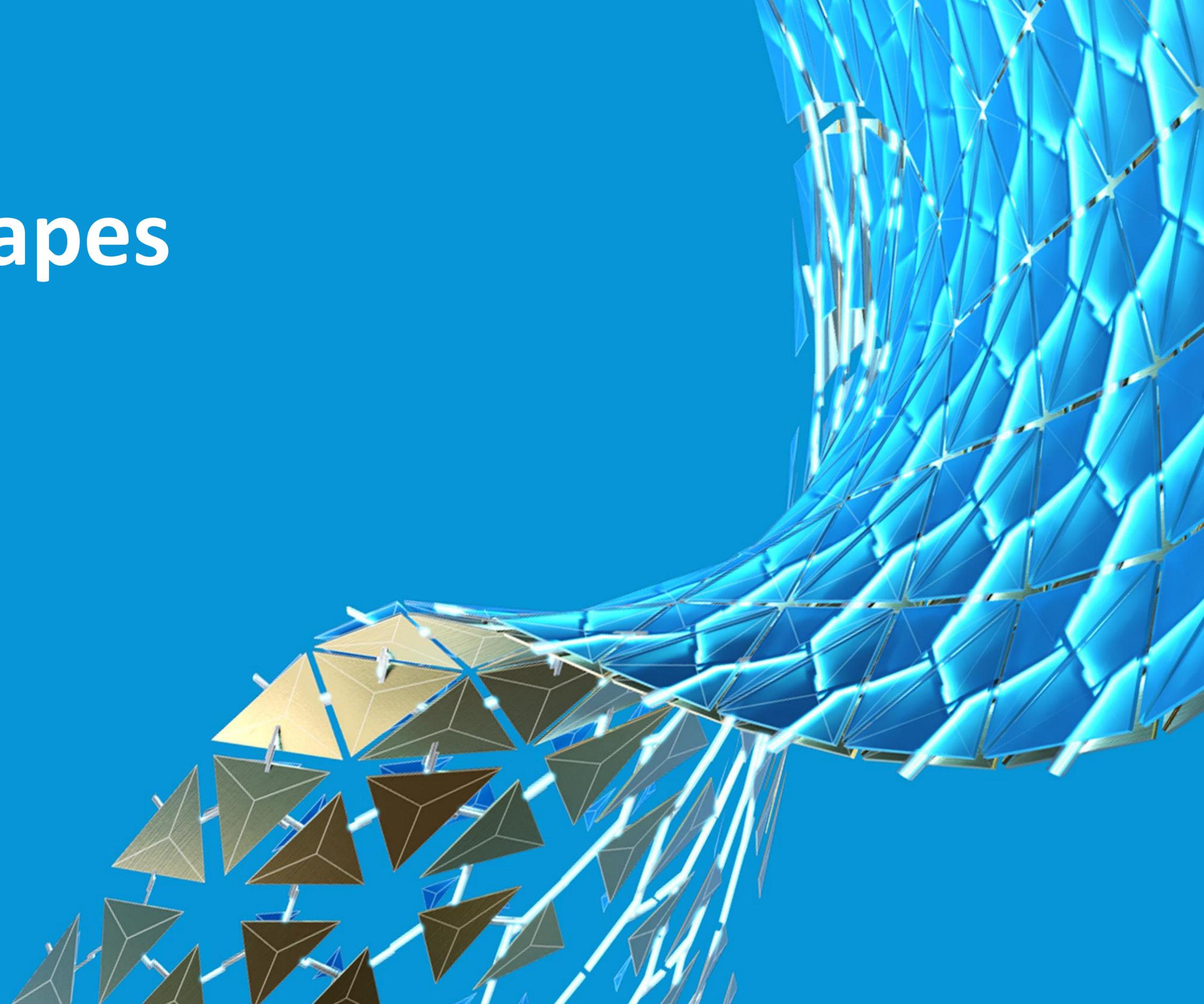
**Mesh size or level of detail**

**Low resolution for faster solution with less detail.  
Typically results in less detailed shape generation**

**High resolution to capture more geometric detail for  
both the preserves and obstacles and the resultant  
generative shape at the cost of increased solve time**



# Starting Shapes

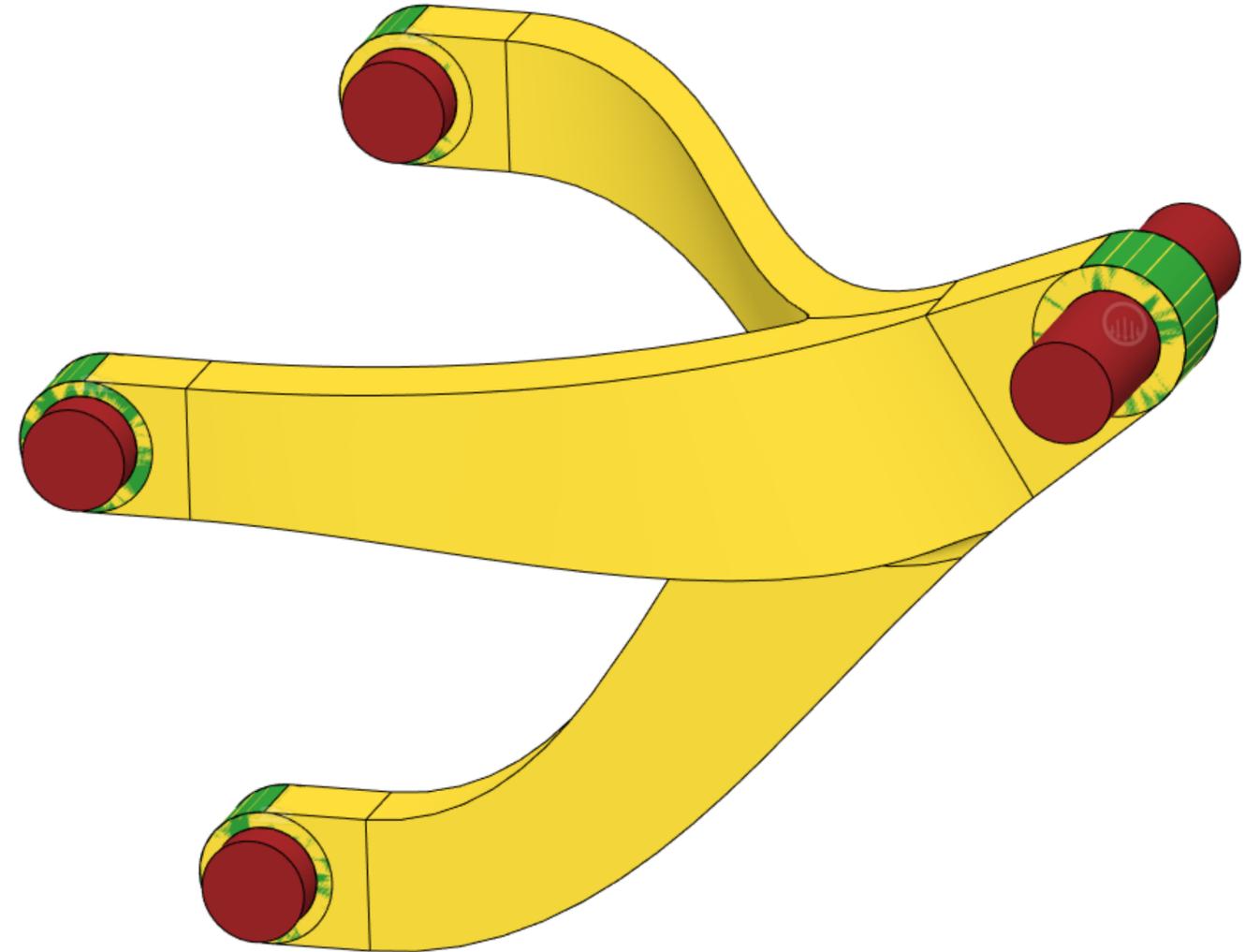


# Starting Shapes

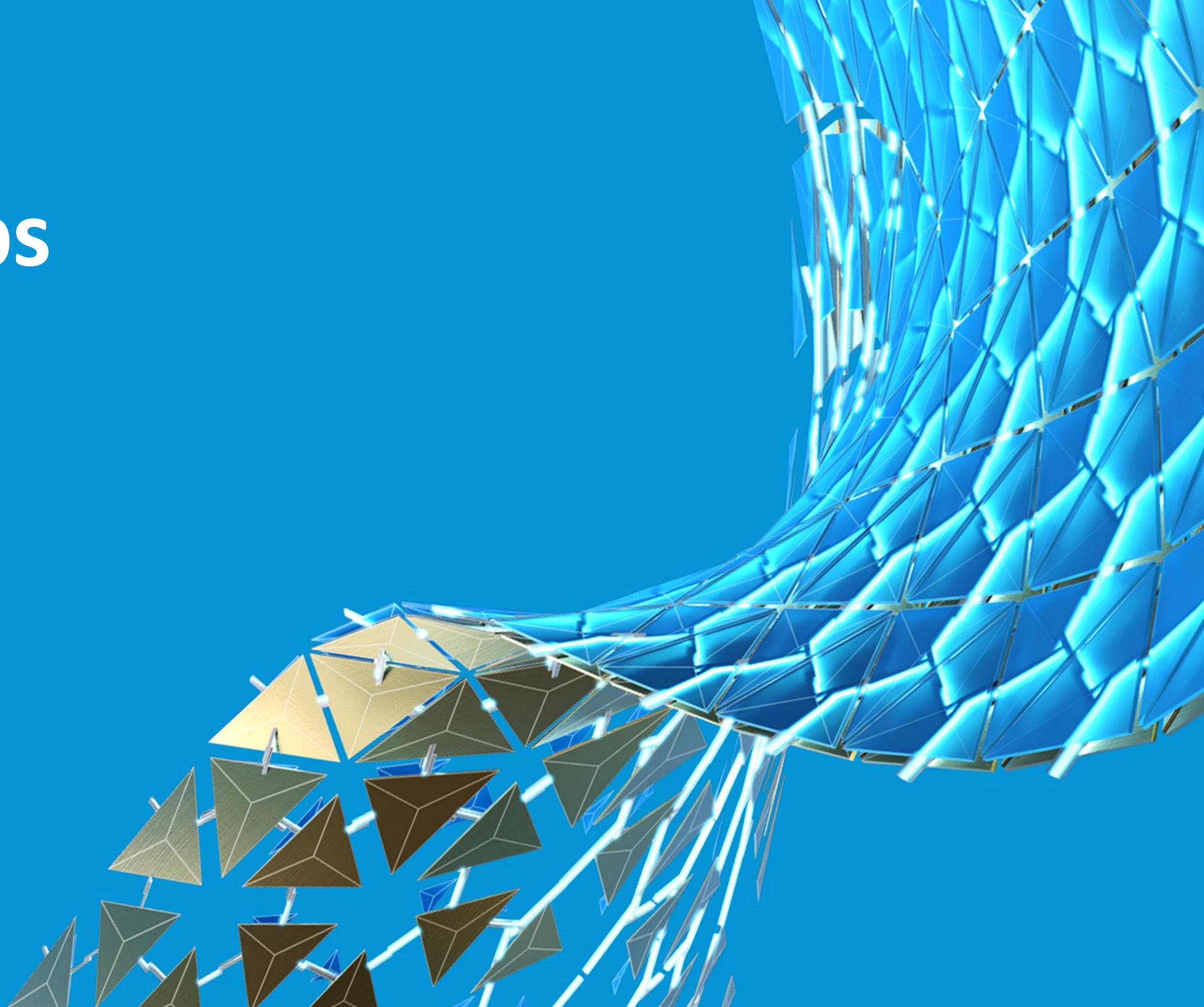
Starting shapes can help to “kick start” a solution to achieve an outcome faster

They **WILL** have an impact on the outcome compared to not using a starting shape

Can be used to continue a run that has not full met target criteria



# T-Spline Tips



# T-Spline Tips

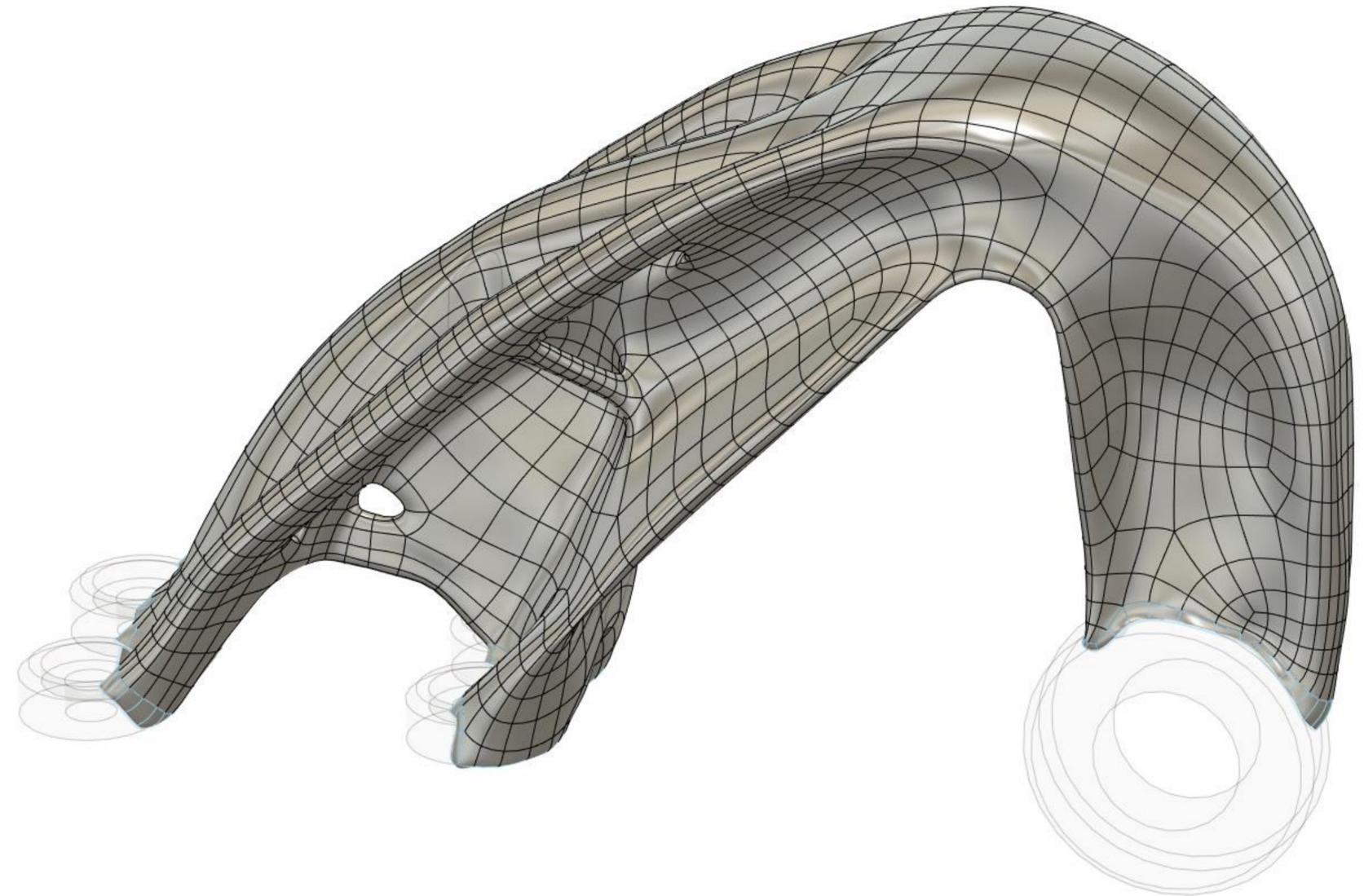
REASONS TO MODIFY A FORM BODY

ALT-ADD WHILE MOVING

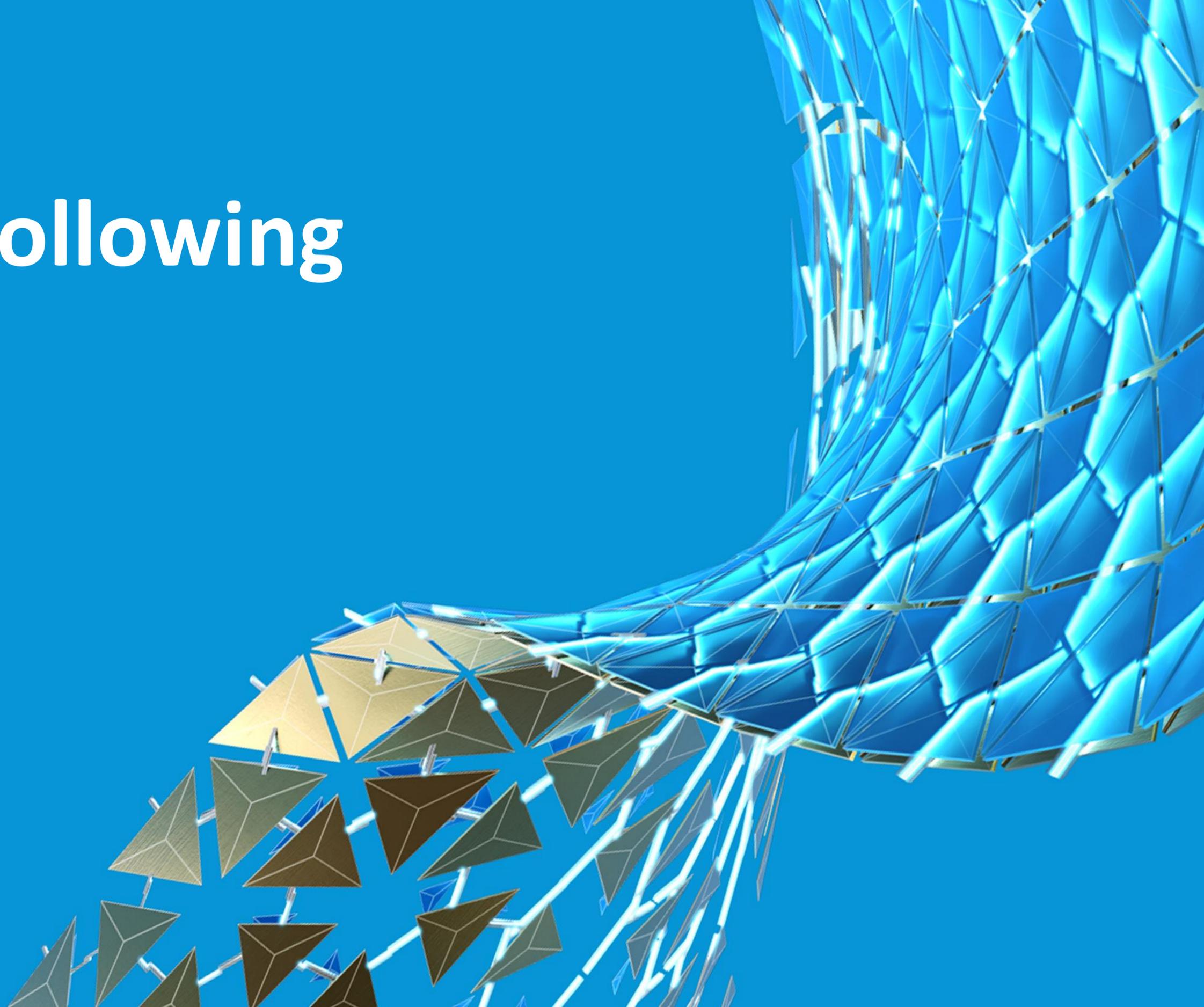
SMOOTHING

CHECKING PRESERVE REGION CONTINUITY

SMOOTH VS BOX VIEW MODES



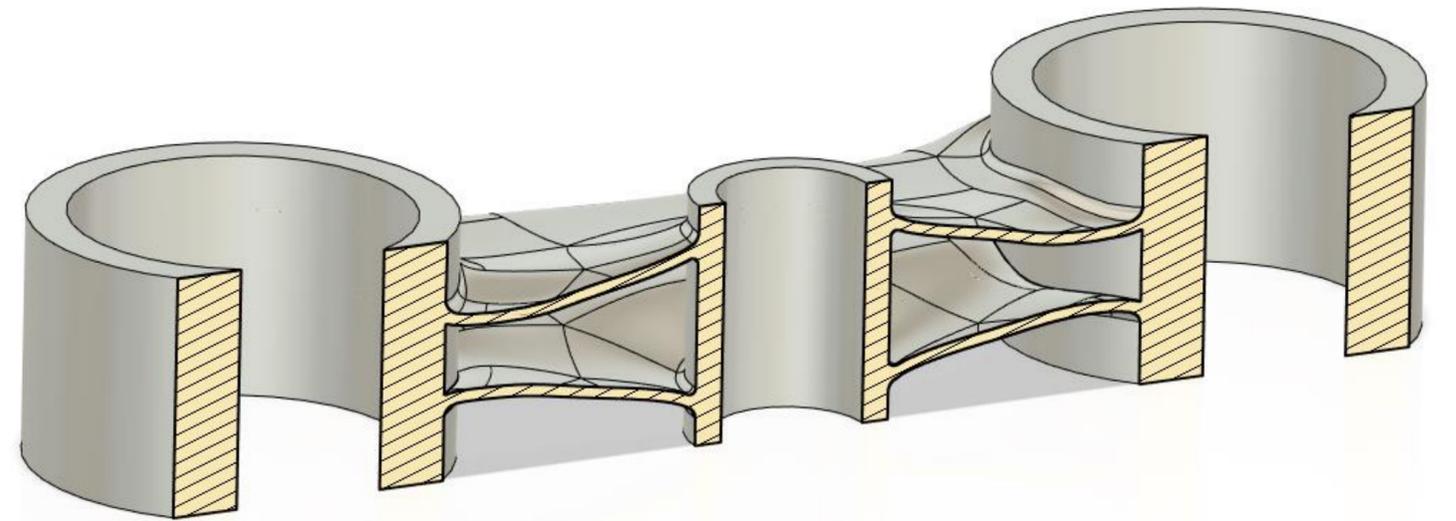
# Outcome Hollowing



# Outcome Hollowing

Hollowing or shelling a complex form body can be challenging

Hollowing at the form body level is more reliable and will result in a better final shape





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