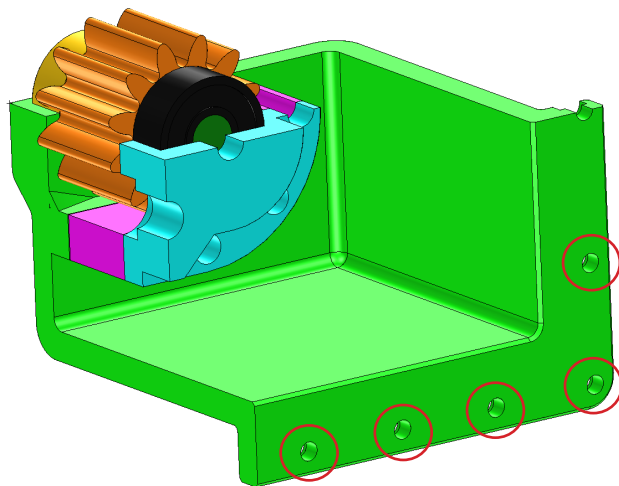


# Patran CAE Solid Modeling

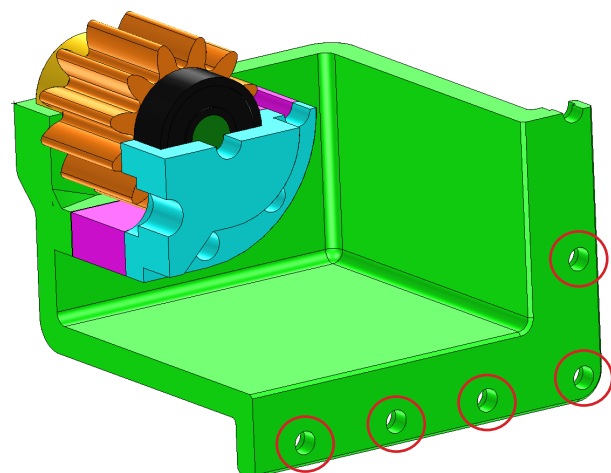
## Solid Modeling Functionality within Patran

### Overview

The Patran CAE Solid Modeling module makes available functionality to create and edit solid geometry within Patran. Analysts can use this module to create conceptual models or edit existing solid geometry. The module may also be used to remedy "dirty" geometry that cannot be immediately meshed. Given Patran's existing meshing capabilities, the availability of solid modeling capabilities makes Patran a flexible pre/post processor for the FEA workflow.



- Interactive recognition of 5 features
- Modify feature parameter
  - Increase diameter from 4mm to 5mm



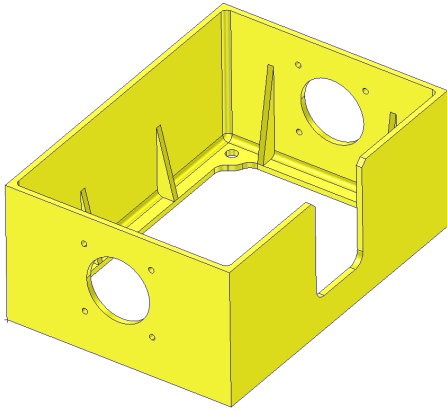
- Original geometry is modified automatically
- FEA and CAE data are updated accordingly
  - No additional editing or re-meshing of FEM is needed

### Capabilities

- Solid primitive creation
  - Block, cylinder, cone, sphere, torus
- B-Rep solid creation
  - Extruded solid
  - Revolved solid
- Solid Editing
  - Boolean, edge blend, imprint, shell, break
- Mid-plane surface extraction
- Refit to parasolid
- Automatic/Interactive feature recognition
  - Parasolid based
  - Recognizable features
    - Hole
    - Blend
    - Chamfer
  - Added functions
    - Edit
    - Delete
    - Show
- Support transform operations

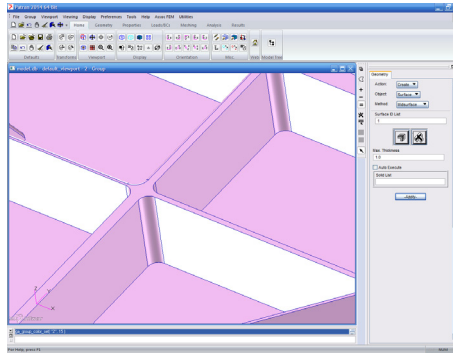
### Solid editing operation

- Boolean operations - add, subtract, intersect
- Edge blend - constant, radius, chamfer
- Imprint - solid on solid
- Shell - create thin wall solids



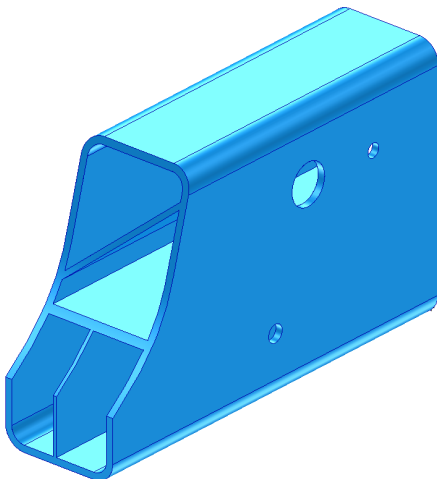
### Mid-surface creation

- Idealization for thin walled bodies
- Automatic
- Manual with trimming tools
  - Perform additional editing
  - Trimming of overlapped edges



### Solid creation operations

- Primitive creation
  - Block, cylinder, cone, sphere, torus
  - Optional on-the-fly Boolean operation
- Extrude and revolve surfaces to solids
- Transformations, including group transform



### Finite element and geometry integration

- Auto update of FEM and CAE data after solid editing operations
- On-the-fly conversion of Patran native geometry

### Automatic and interactive feature recognition

- Parasolid based
- Recognizable features
  - Hole
  - Blend
  - Chamfer
- Edit/Delete/Show features

**Corporate**  
 MSC Software Corporation  
 4675 MacArthur Court  
 Suite 900  
 Newport Beach, CA 92660  
 Telephone 714.540.8900  
[www.mscsoftware.com](http://www.mscsoftware.com)

**Europe, Middle East, Africa**  
 MSC Software GmbH  
 Am Moosfeld 13  
 81829 Munich, Germany  
 Telephone 49.89.431.98.70

**Asia-Pacific**  
 MSC Software Japan LTD.  
 Shinjuku First West 8F  
 23-7 Nishi Shinjuku  
 1-Chome, Shinjuku-Ku  
 Tokyo, Japan 160-0023  
 Telephone 81.3.6911.1200

**Asia-Pacific**  
 MSC Software (S) Pte. Ltd.  
 100 Beach Road  
 #16-05 Shaw Towers  
 Singapore 189702  
 Telephone 65.6272.0082



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