

## Homework 2: Optimization for GE bracket

Loading bracket is a critical component in jet engines: they must support the engine's weight during handling without distortion or breaking. Topology optimization is usually employed to determine the most-efficient material distribution under the given loading conditions, as shown in Figure 1. This project is to optimize the topology of a bracket (design domain), as shown in Figure 2.

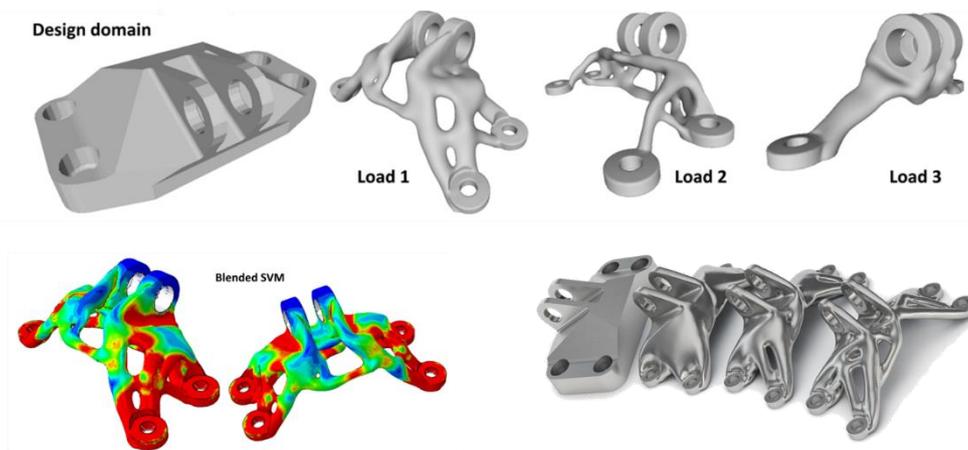


Figure 1. Optimization for GE bracket

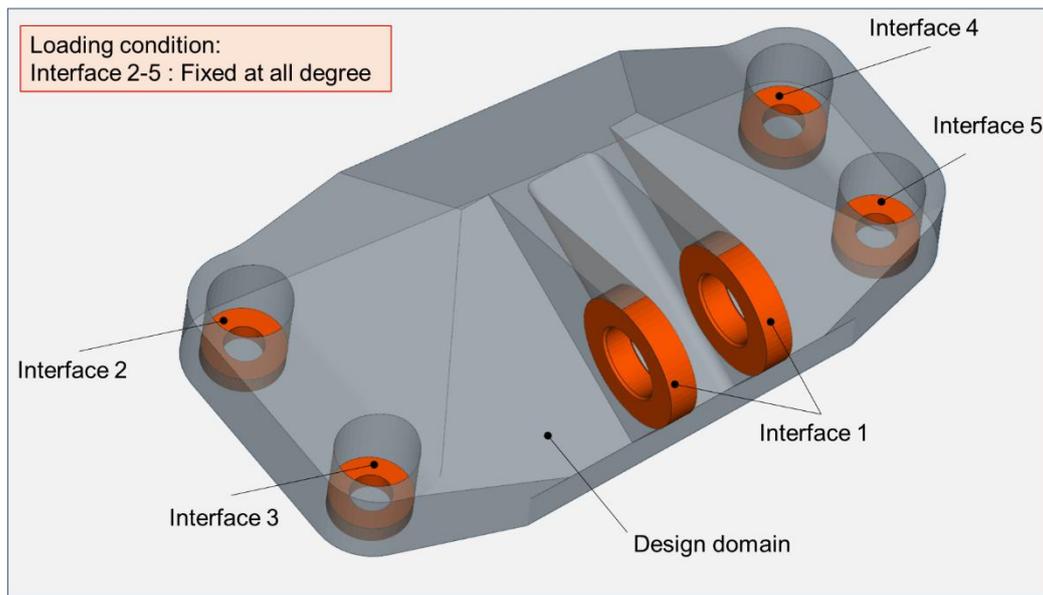


Figure 2 Original domain of GE bracket

1. As shown in Figure 2, to optimize a bracket:

1.1 Interfaces 2-5 are fixed, which is the only specified boundary condition in this project.

1.2 Applying a reasonable loading on the interface 1.

1.3 Original geometry was given in 'original.STL' or 'original.stp'. You can also modify the original design domain while keeping the five interfaces' relative location.

1.4 A user guide for topology optimization in Solidworks was attached for your reference. You can also choose other software or write algorithm to do the optimization.

2. As there is no detailed specification in the Interface 1, no two submissions should look the same.

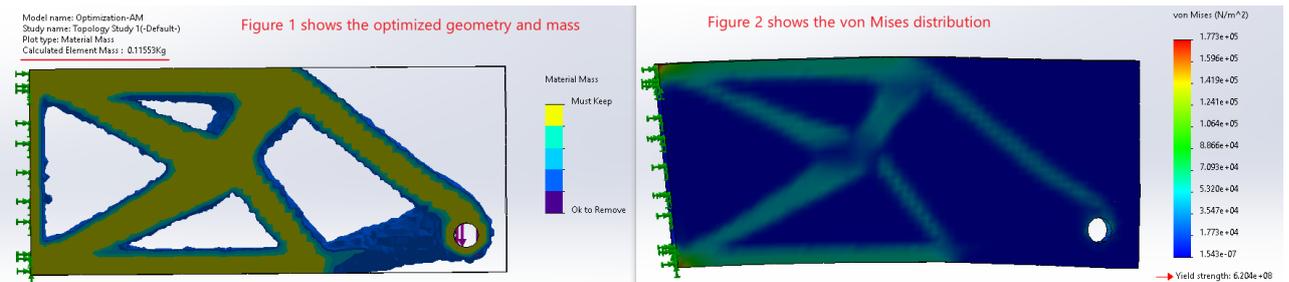
3. Submission deadline: 20 Mar 2023,23:59 pm.

4. Each submission contains:

4.1 A STL file.

4.2 A report no more than 1-page of A4 paper (12pts Times new Roman). (1) Loads definition should be described. (2) Result and stress field distribution should be contained, as shown below.

5. Please submit to the blackboard.



6. Marking scheme: total 20 points of the final score. (1) Optimized smooth geometry (STL) and a report -12 points; (2) Good balance between weight and stress distribution -8 points; (3) Late submission- every day of delay - minus 5 points; (4) Identical submissions- minus 12 for each; (5) Download from web- minus 20 points.