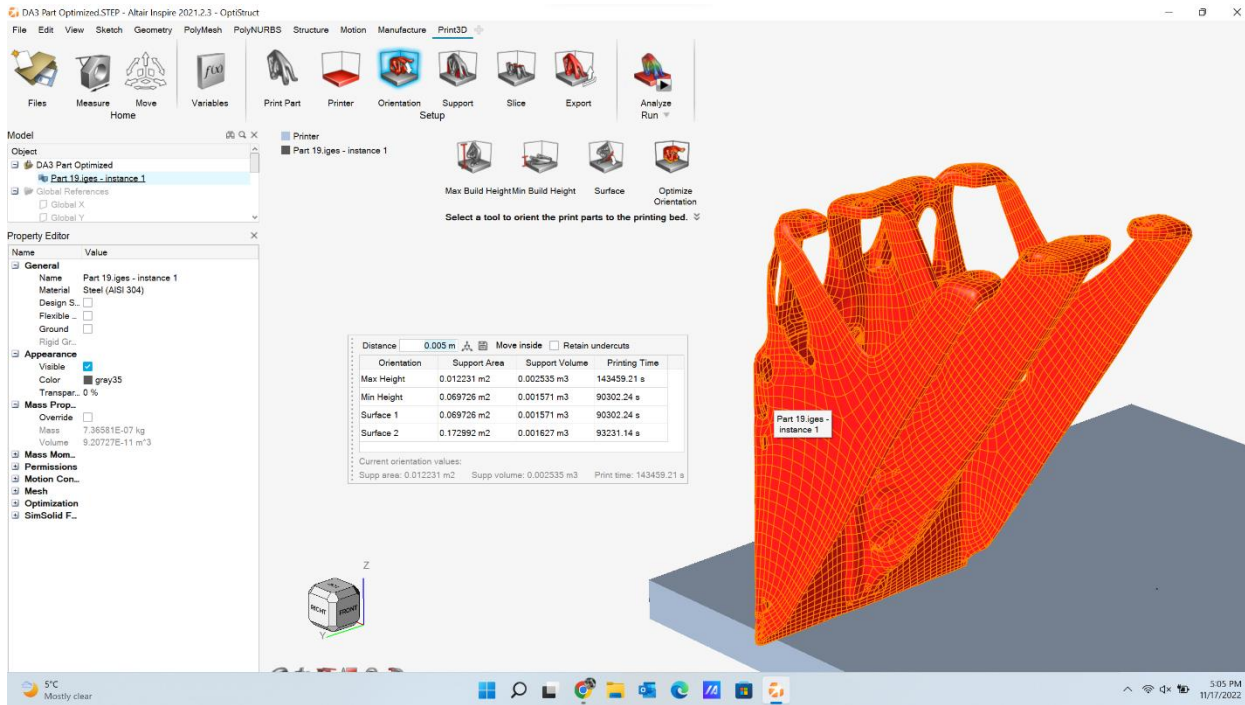


# KALPAK R HEDAWOO

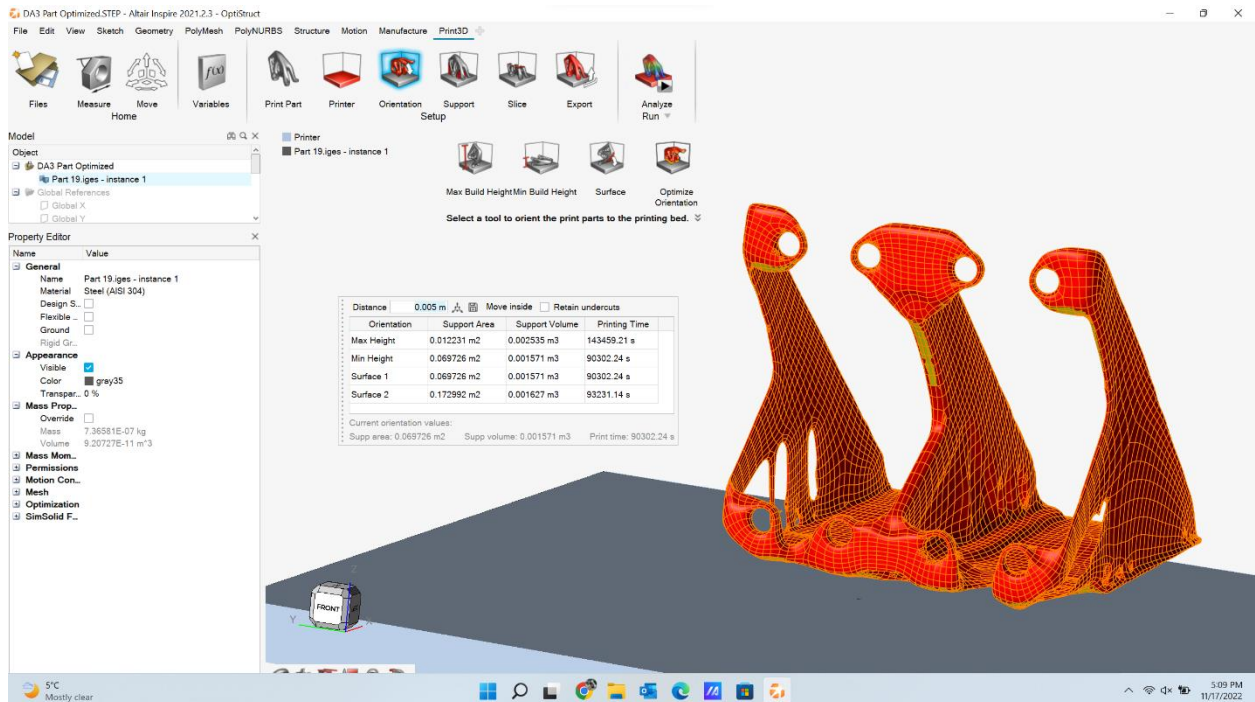
## DESIGN ASSIGNMENT – 3

### ME-653-DESIGN FOR ADDITIVE MANUFACTURING

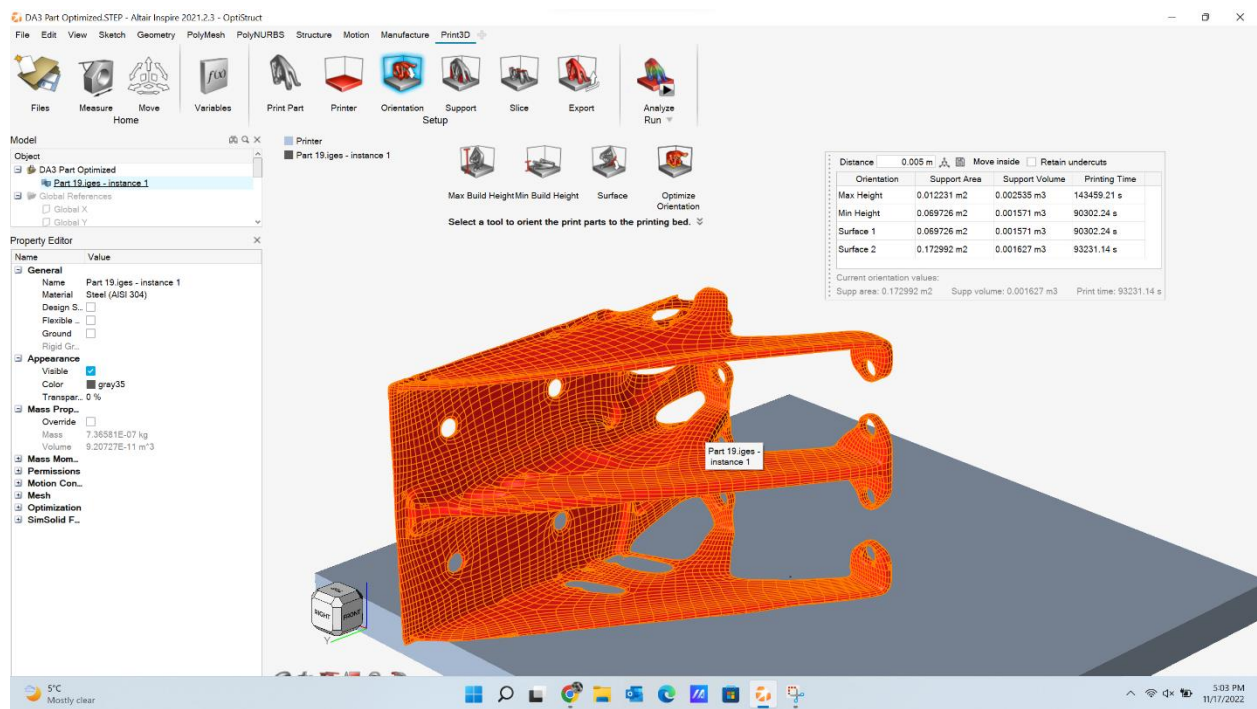
**B]**



## O1-MAXIMUM HEIGHT ORIENTATION



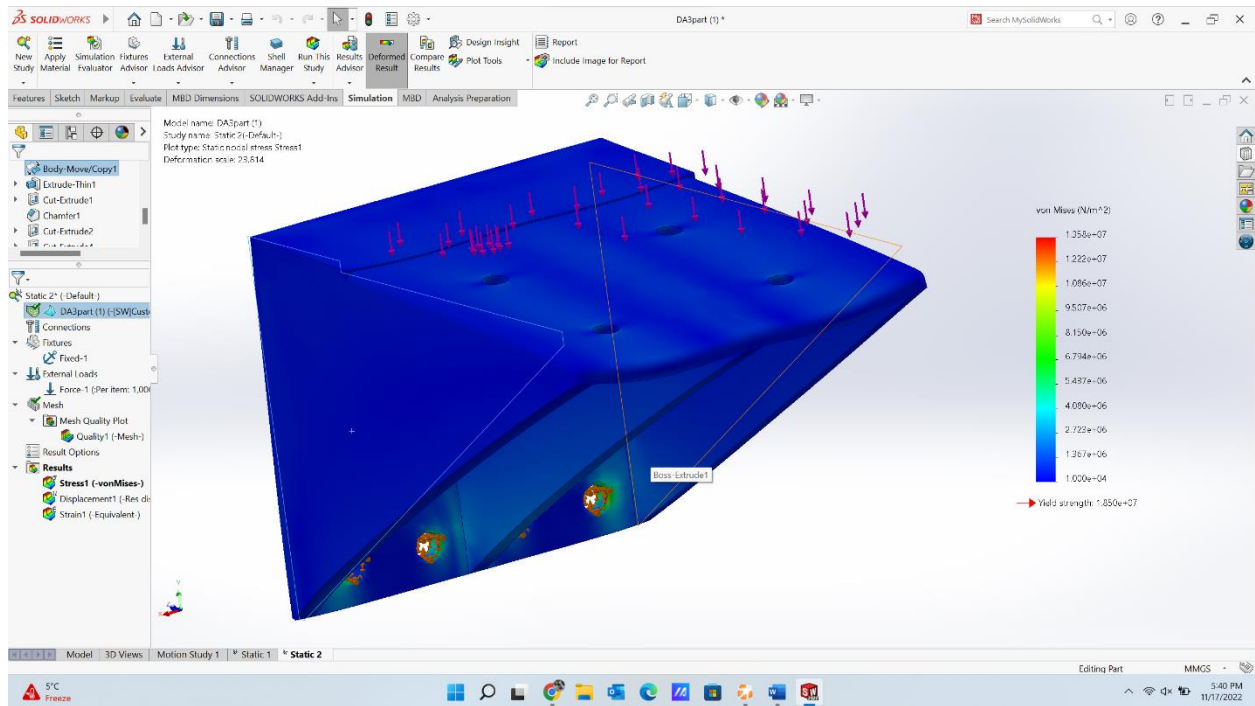
## O2-MINIMUM HEIGHT ORIENTATION



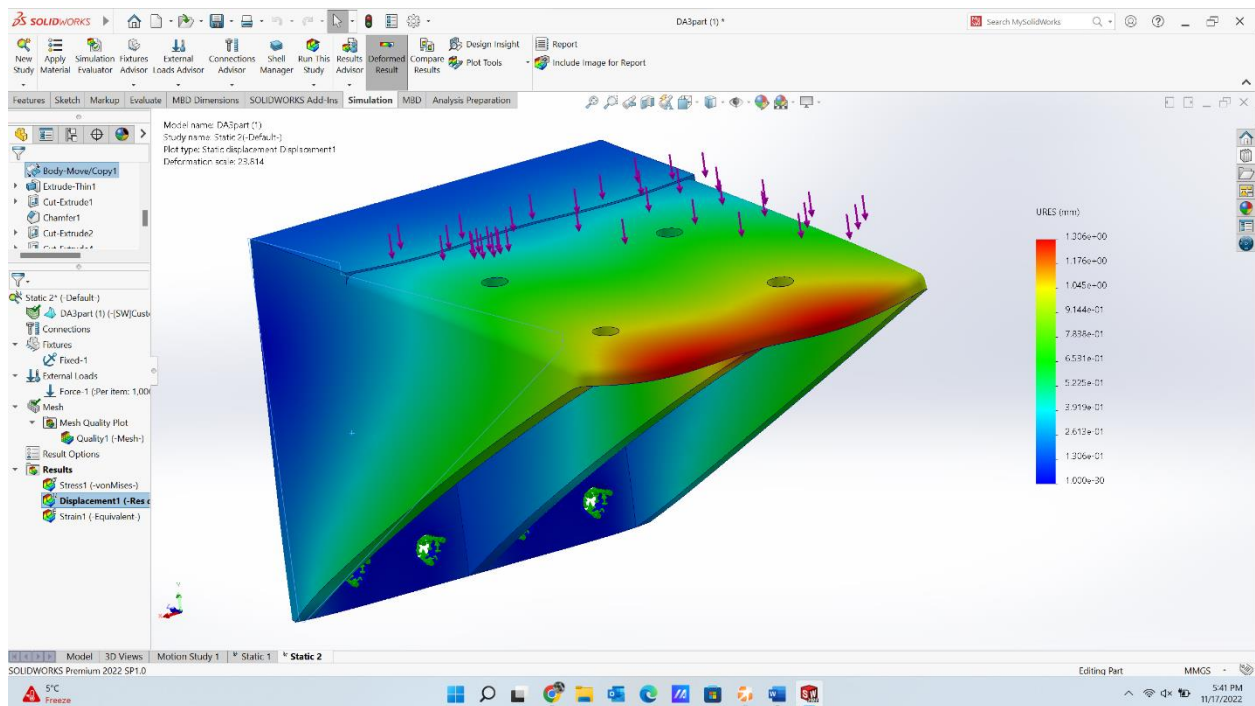
## O3-ORIENTATION BASED ON A PARTICULAR SURFACE

Category / Criteria	Orientation 1	Orientation 2	Orientation 3
Build time	<b>143459.21 s</b>	<b>90302.24 s</b>	<b>93231.14 s</b>
Support material	<b>0.002535 m3</b>	<b>0.001571 m3</b>	<b>0.001627 m3</b>
Surface quality	<b>High</b>	<b>Medium</b>	<b>Low</b>
Printing cost	<b>High</b>	<b>Low</b>	<b>Medium</b>
Mechanical Performance (Qualitative Assessment)	<b>High</b>	<b>Medium</b>	<b>Low</b>

D]

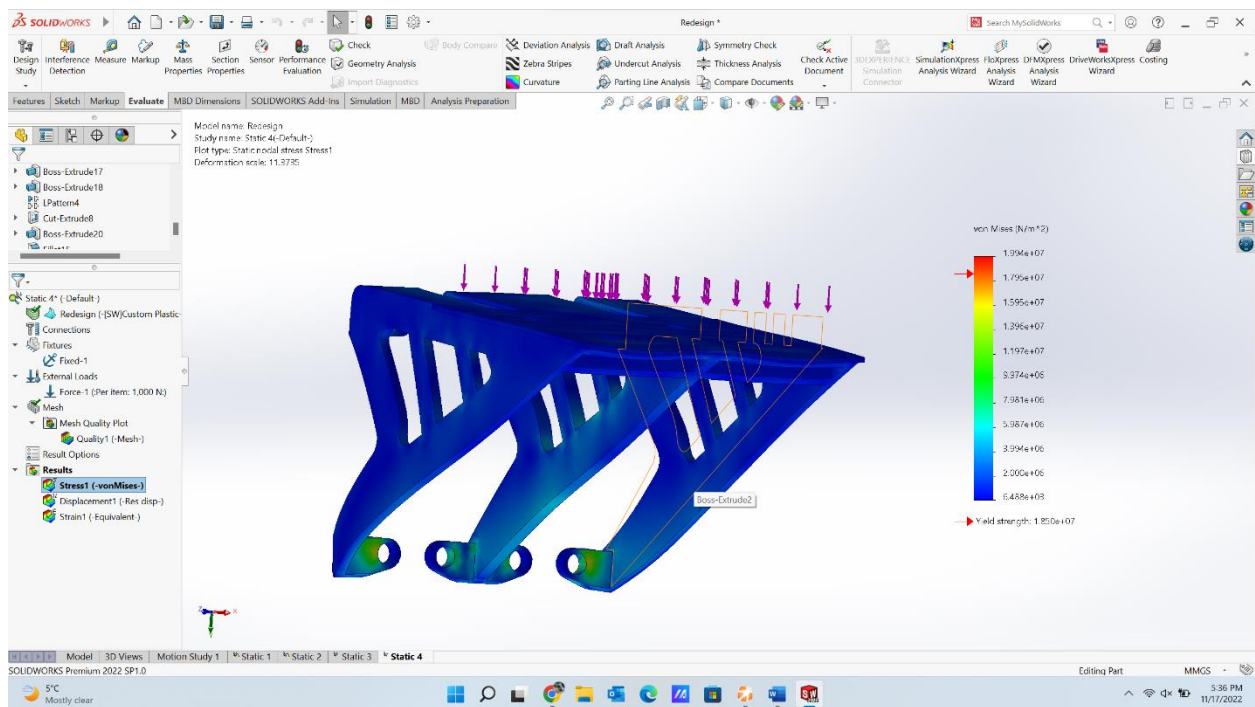


## ORIGINAL DESIGN VON MISSES STREES ANALYSIS

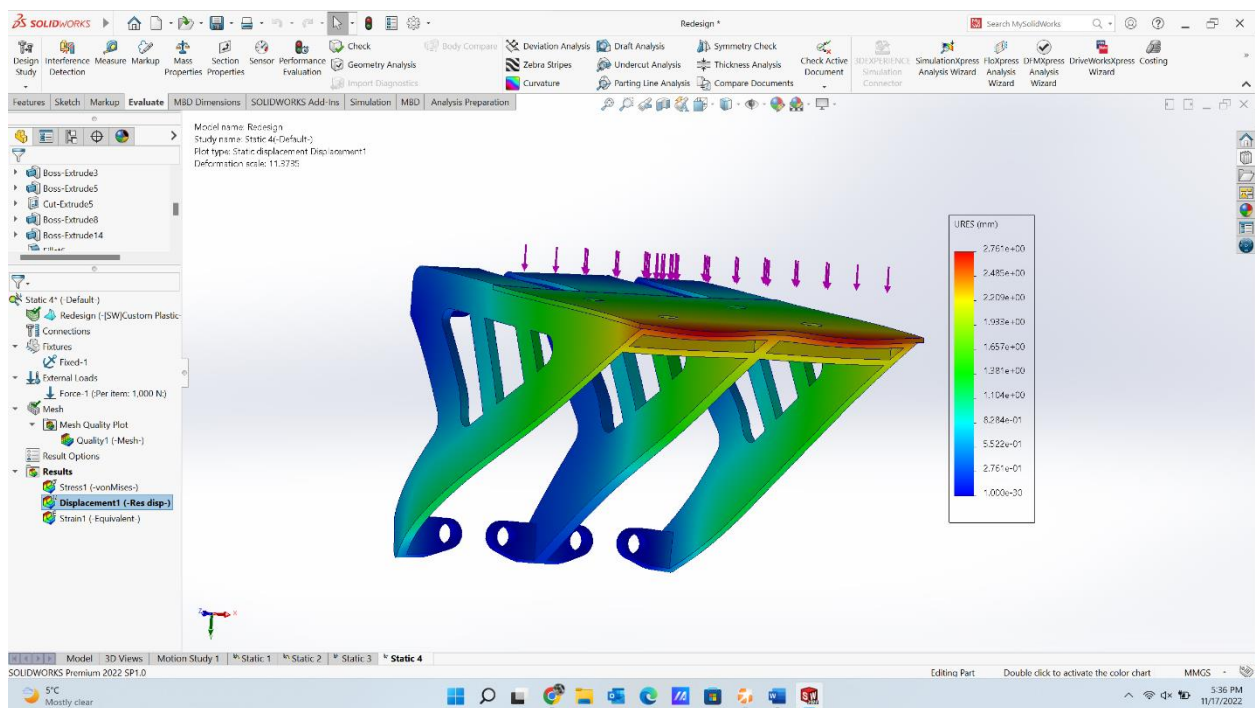


## ORIGINAL DESIGN DISPLACEMENT ANALYSIS

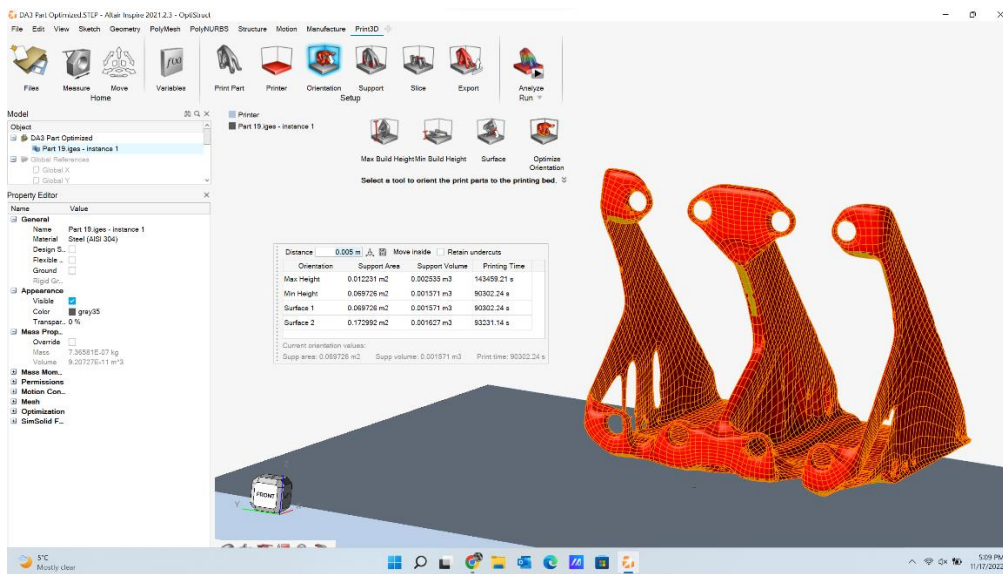




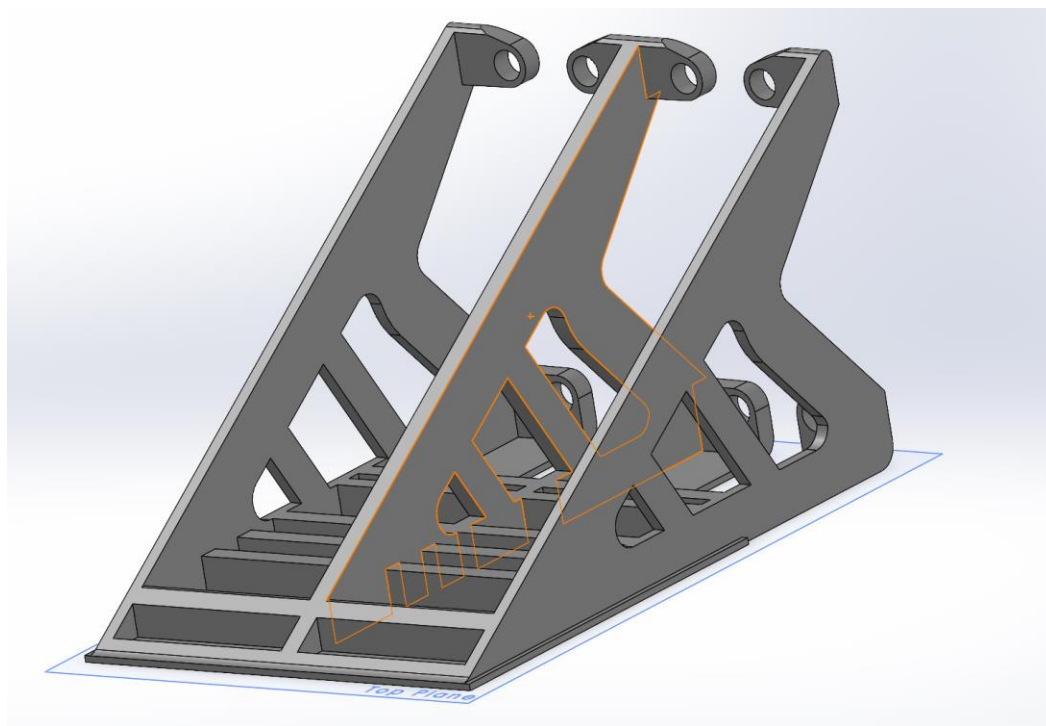
## RE-DESIGN VON MISSES STREES ANALYSIS



## RE-DESIGN DISPLACEMENT ANALYSIS



## ORIENTATION SELECTED



## RE-DESIGN

Category / Criteria	Original Design	Topology Optimization	Redesign for AM
Weight (grams)	1842.89	1234.36	890.18

Max Von-Mises Stress (N/m <sup>2</sup> )	1.334x10 <sup>7</sup>	1.765x10 <sup>7</sup>	1.994x10 <sup>7</sup>
Max Displacement (mm)	1.304	2.913	2.761