



DRONE DESIGN

COURSERA ONLINE COURSE [[Engineering Design Process With Autodesk Fusion360](#)]

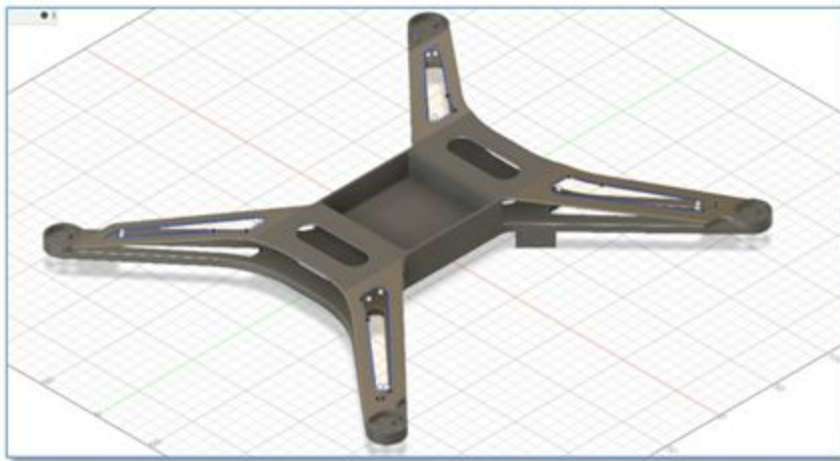
06.06.2019

SREERAG S

AIM

Perform a static simulation study on your quadcopter design. See if the design holds up to a 12oz force at each propeller face with no more than 0.75mm deflection at each landing gear position.

INITIAL DESIGN



This design was able to satisfy the given conditions, but it had stress concentration on the top corners of the component tray. There was also some displacement and flexibility issues on the top face of the four extending arms. In this design, the landing legs

were positioned as in the image above and it did not have any structural integrity.

DESIGN MODIFICATION



This new design was able to avoid the stress concentration on the top corners of the quadcopter, as now the component tray opening is on the bottom.

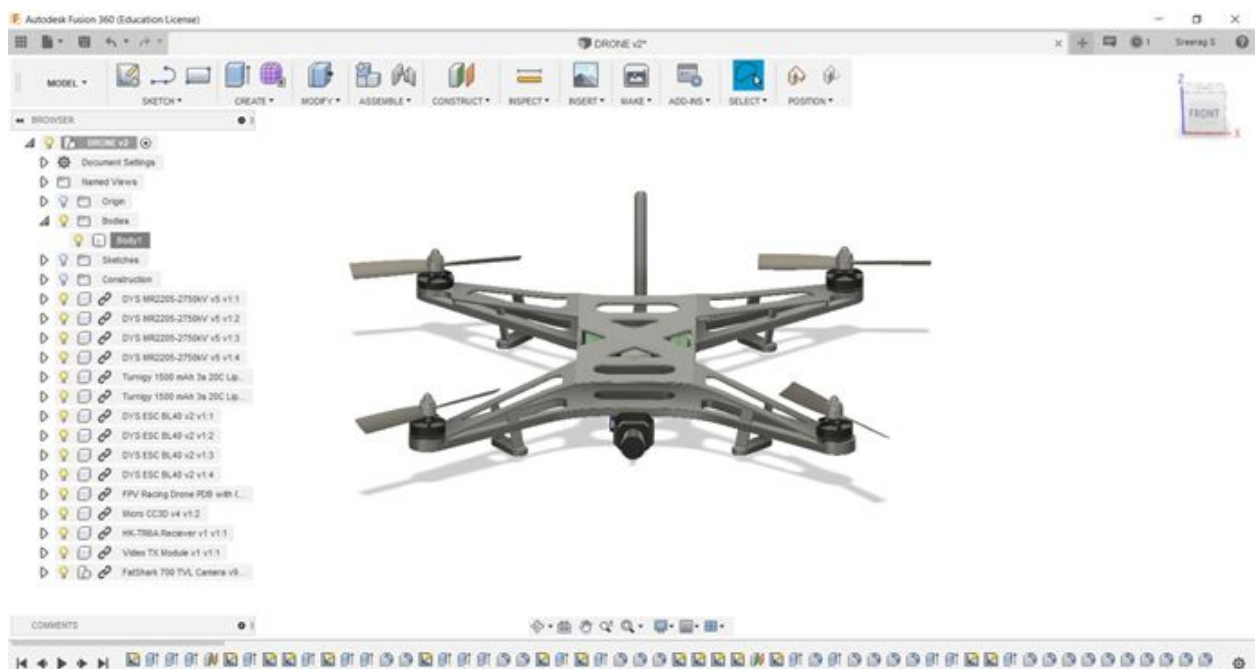
LANDING GEAR

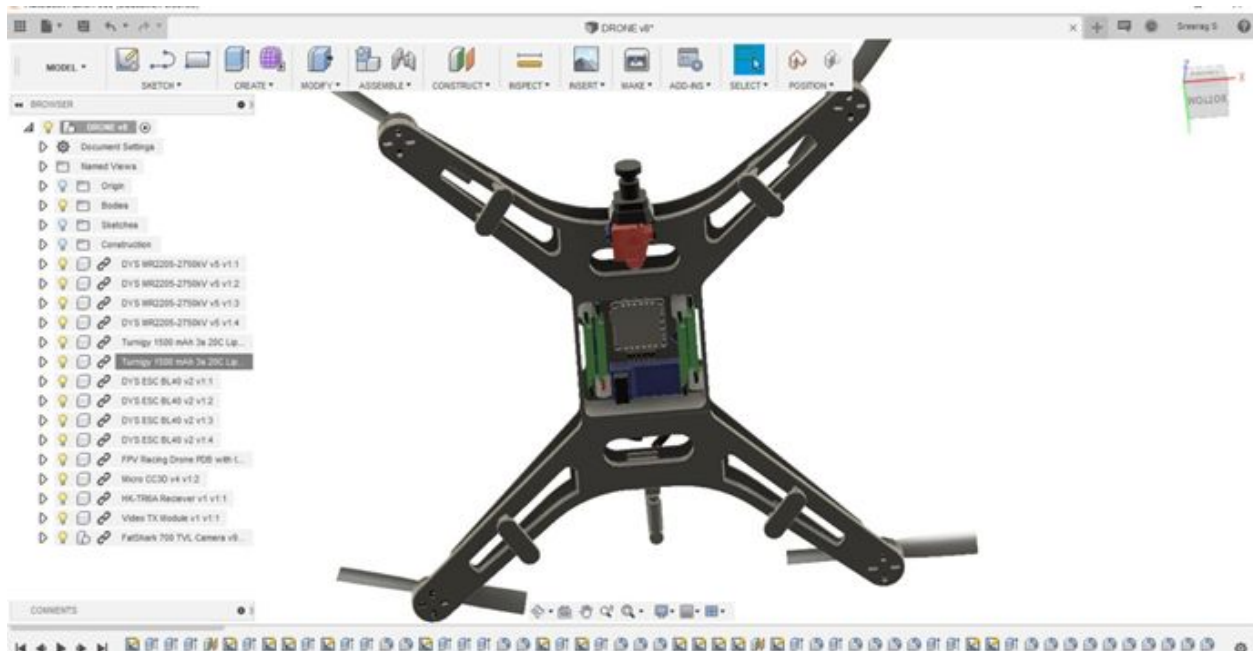
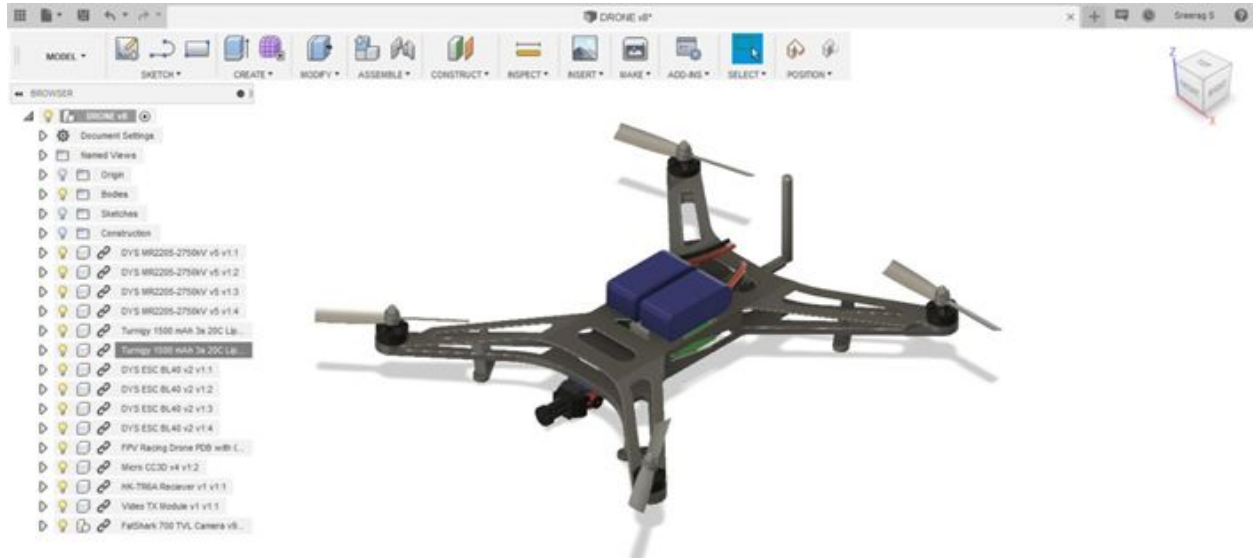


The landing gear also provides support to the top region of the quadcopter arm. Thus the flexibility of the top region during loading can be minimized.

All the sharp corners are avoided using the fillet tool. As sharp corners are stress generators.

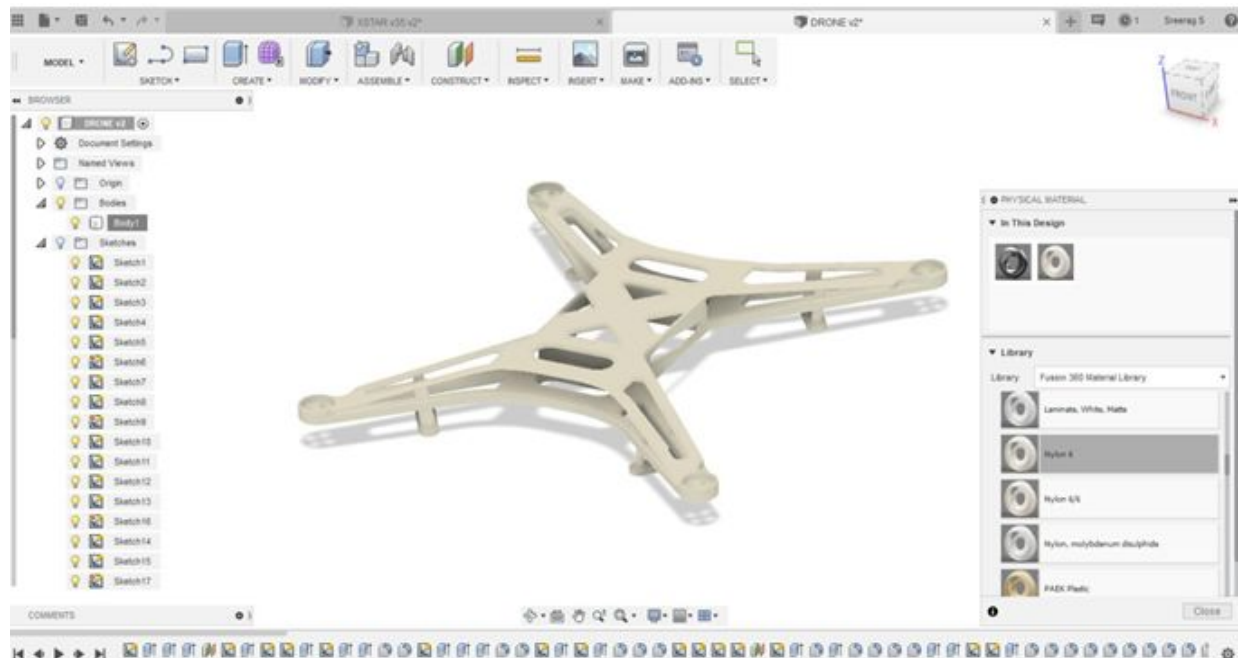
MODEL





PHYSICAL MATERIAL

As the design is to be 3D printed the physical material is chosen as **NYLON 6**.



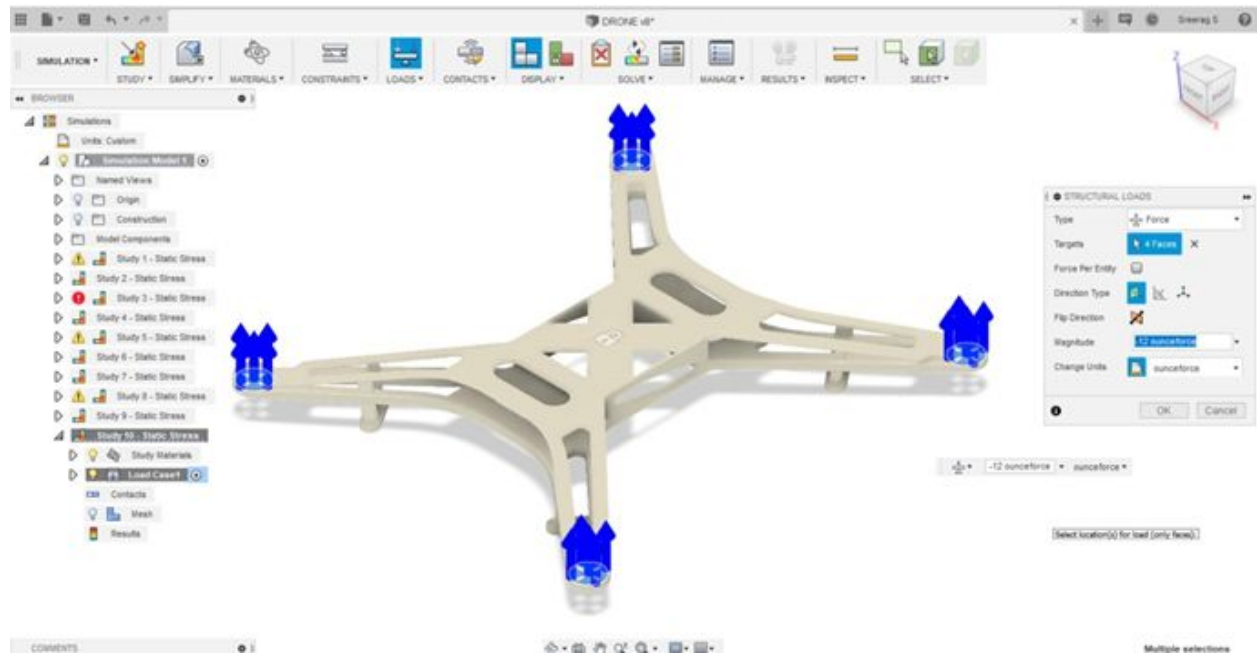
MASS PROPERTY

MASS = 264.43g

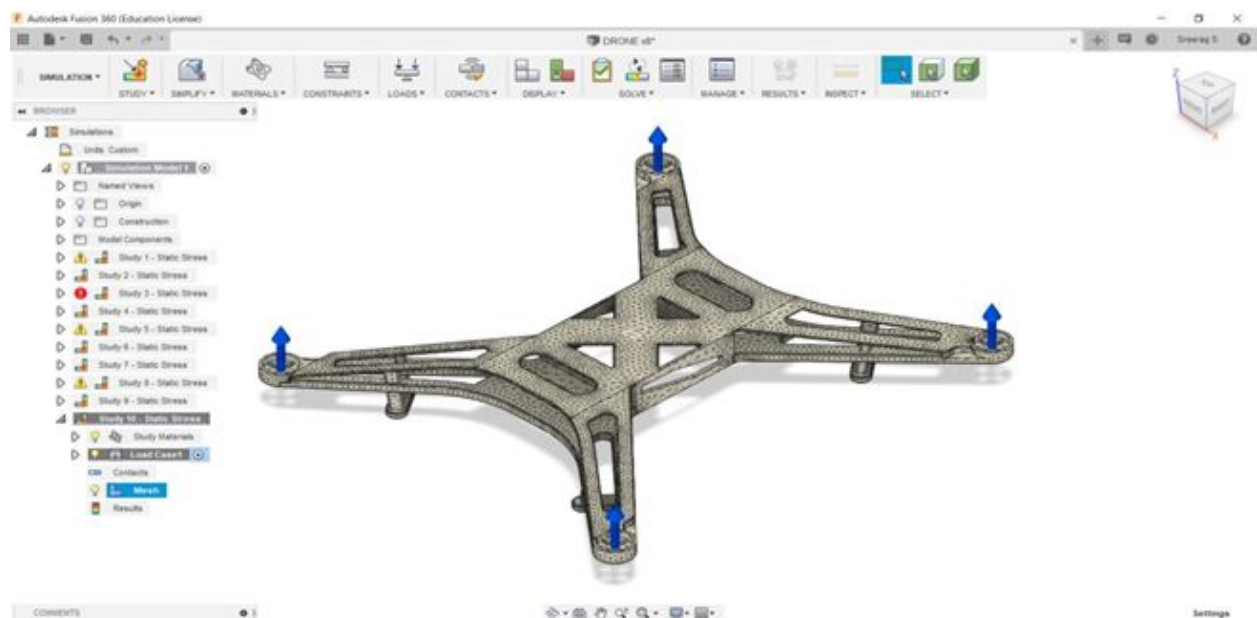


SIMULATION REPORT

APPLIED LOAD = 12oz on each propeller face.



MESH GENERATION



The static simulation study was done on the quadcopter by applying 12oz force at each propeller face. The deflection on the landing gear was less than 0.75mm and the design simulation results show the design is a success and satisfies all the given conditions in the question.

RESULT

