Digital Fabrication Project report

April 28, 2024

1   Team

Team Name - **Pengo Society**

Members -

|	
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2   Introduction

The project made by our group is a model of PanzerIV tank that was used in WWII. The model is static, and is quite detailed for its size. The reason to pick this model was its complexity, as this model was not supposed to move the fine details are what make it a good project.
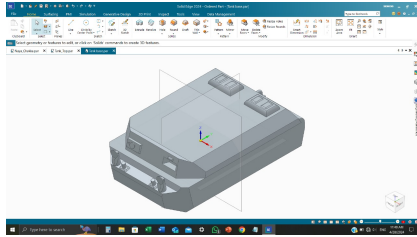
3   Model Design

The usual tools like extrude, hole, draft, etc, were used in the making of the model, also some new tools like pattern, sweep and 3d mirror were used, in addition assembly was used by us for the first time in this project.
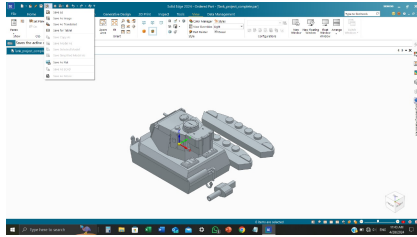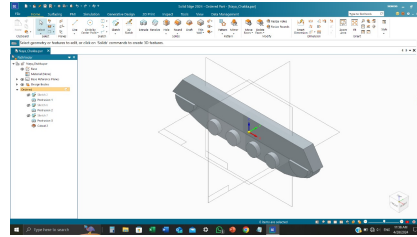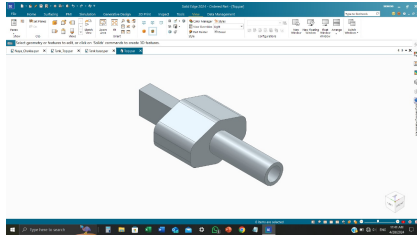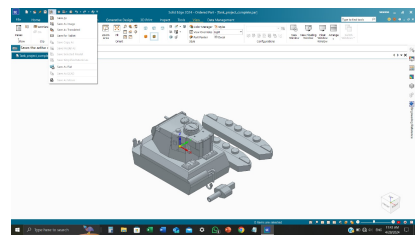
(a)
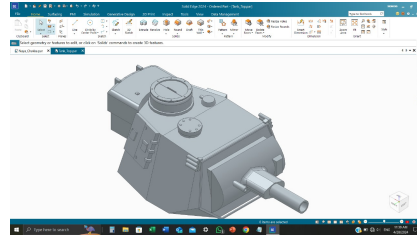
(b)

(c)

(d)

(e)

(f)

4   Converting from .par to .stl

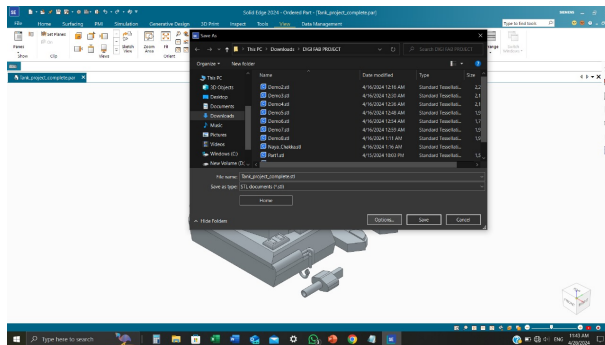Following figures show how to convert .par file to .stl in solidedge
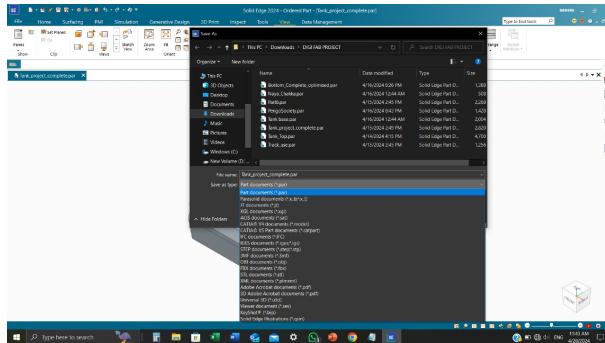
Figure 1: Select the save as option

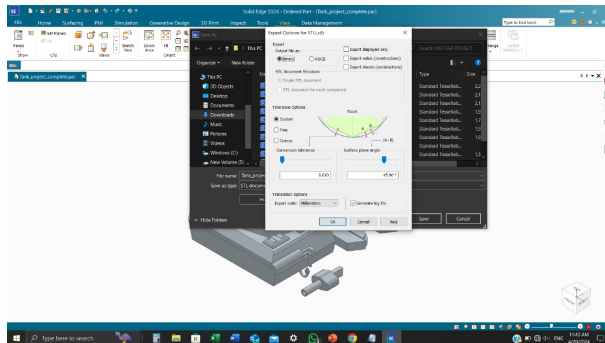Figure 2: Choose the .slt format from dropdown menu

Figure 3: Go to the options dialogbox and select milimeter as export unit while keeping the conversion tolerance to minimum
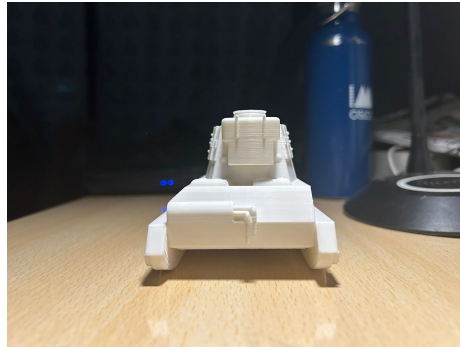
5 Results

Figure 4: Back view

Figure 5: Top view

Figure 6: Front View
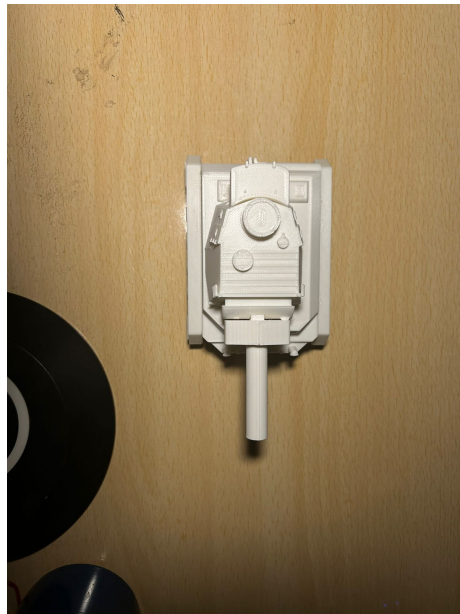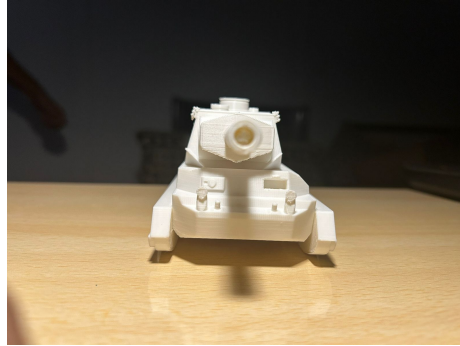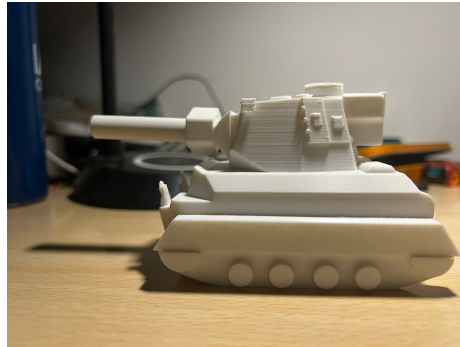

Figure 7: Side View

6   3D Printing

6.1   Experience

3D printing was a very new and joyful experience, from reducing the printing time form days to hours to seeing the printer for the first time and the whole process of joining the different parts of the model. It was a pleasant experience trying this new technology which keeps on growing and is giving rise to new innovations.

6.2   Challenges

Well the biggest challenge after building the model was to reduce the printing time of the model, with help from our TA we understood the following factors which were responsible for the increase in printing time

1. More ***Infill density*** can result in a stronger object but it also increases the printing time hence a infill of 30-50 percent is optimum for such a project.

2. ***Support reduction*** is a major step in reducing the printing time. As all support is waste material we want to minimize the support just not to reduce waste but also to print fast as the lesser the support the lesser the time to print.

3. ***Infill Pattern*** also playes a major role as some patterns like lightning are fast to print but there is also a compromise in the toughness of the final object.

4. ***Model scaling*** can reduce a big chunk of printing time, but it also comes with less detailing, as we reduce the scale the finer details may not be printed due to the precision of the printer.

7   Learnings

This project helped us learn a lot about designing and the various difficulties of building a prototype from an idea. We also learned about how and why 3D printing works and the properties of a 3D printed object.
It can be said the now our group is capable of designing our ideas into CAD models and to bring the models into reality using 3D printing