

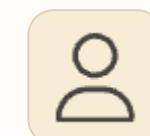
Panzer III Tank: 3D Printing Project

Team - EdgeXtrude

Group no. - B4O

Professor - Anupam Datta Sir

TA - Kasi Dhanvi



Adhvith -
ES24BTECH11027



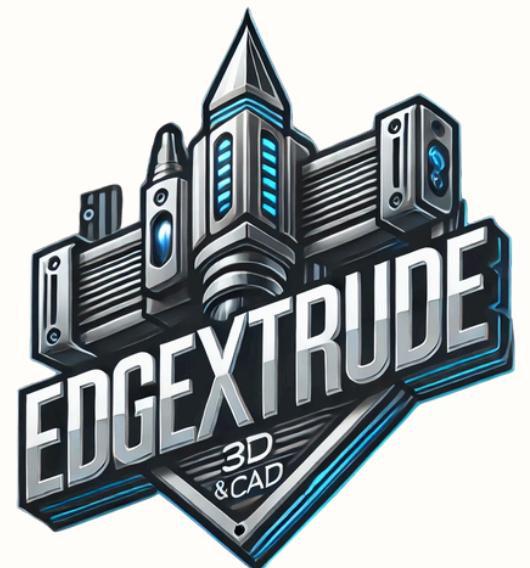
Malhar -
ES24BTECH11018



Kripalu -
ES24BTECH11021



Susheel -
ES24BTECH11013



Project Overview



Historical Significance



The Panzer III was a cornerstone of early Blitzkrieg tactics—balancing firepower, mobility, and endurance to spearhead infantry advances in WWII.



Why We Chose This Model ?

Its small-tank size offers just the right level of geometric and mechanical complexity for a 3D-printing project. Our model features a **fully rotating turret** and an elevating main gun, recreating and adding some our own creativity on the original's structural and functional sophistication.



Manufacturing Challenge

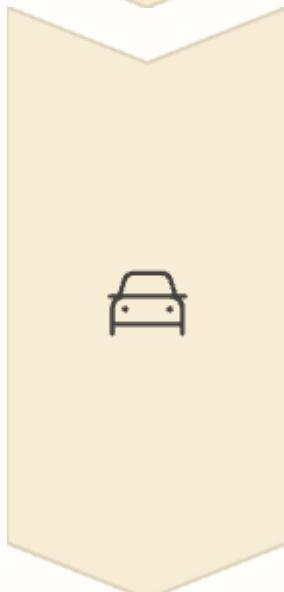
We had to optimize our design to preserve fine details while ensuring each component remained printable and could be accurately assembled.

CAD Design Process



Basic Tools

Extrude, hole, sweep and draft functions alongwith some advanced features like Pattern and 3D Mirror for symmetrical components



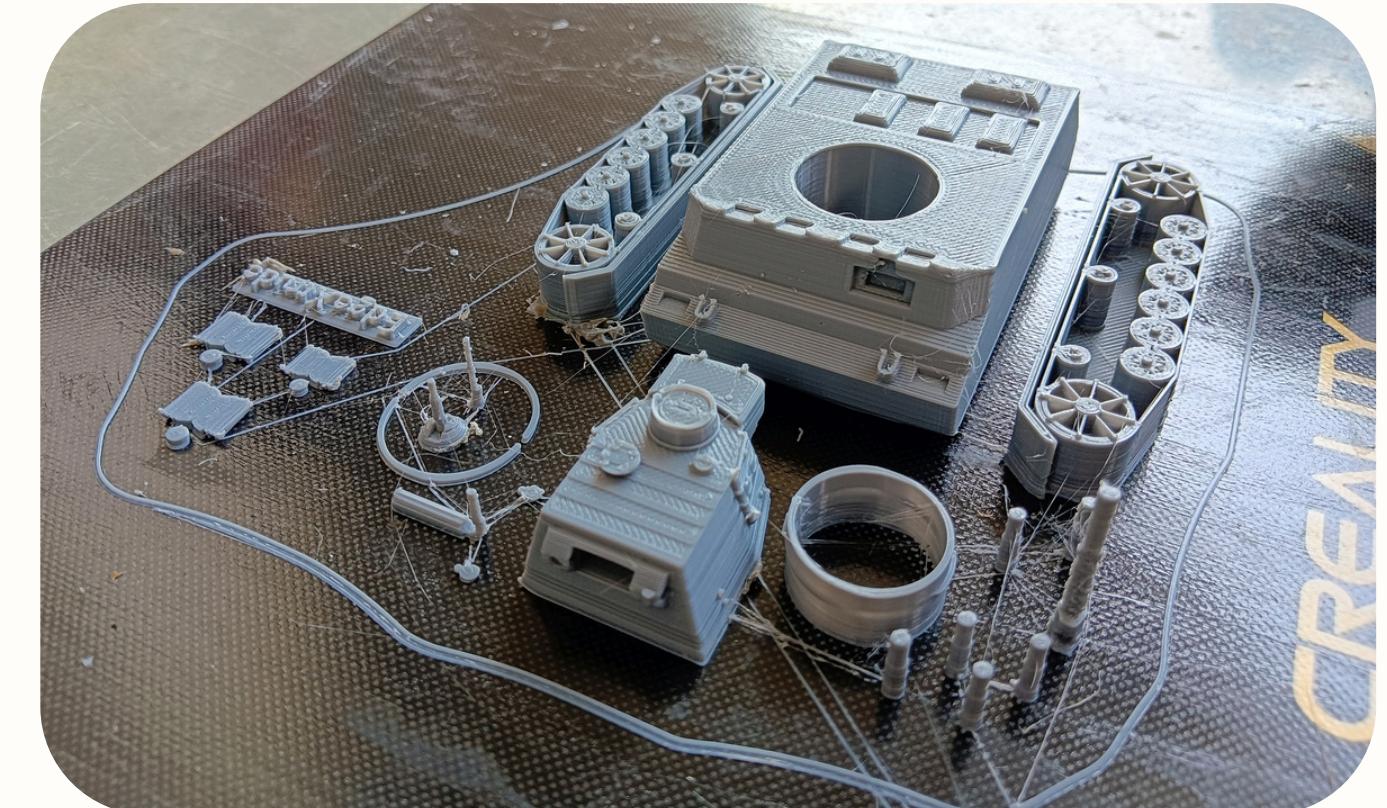
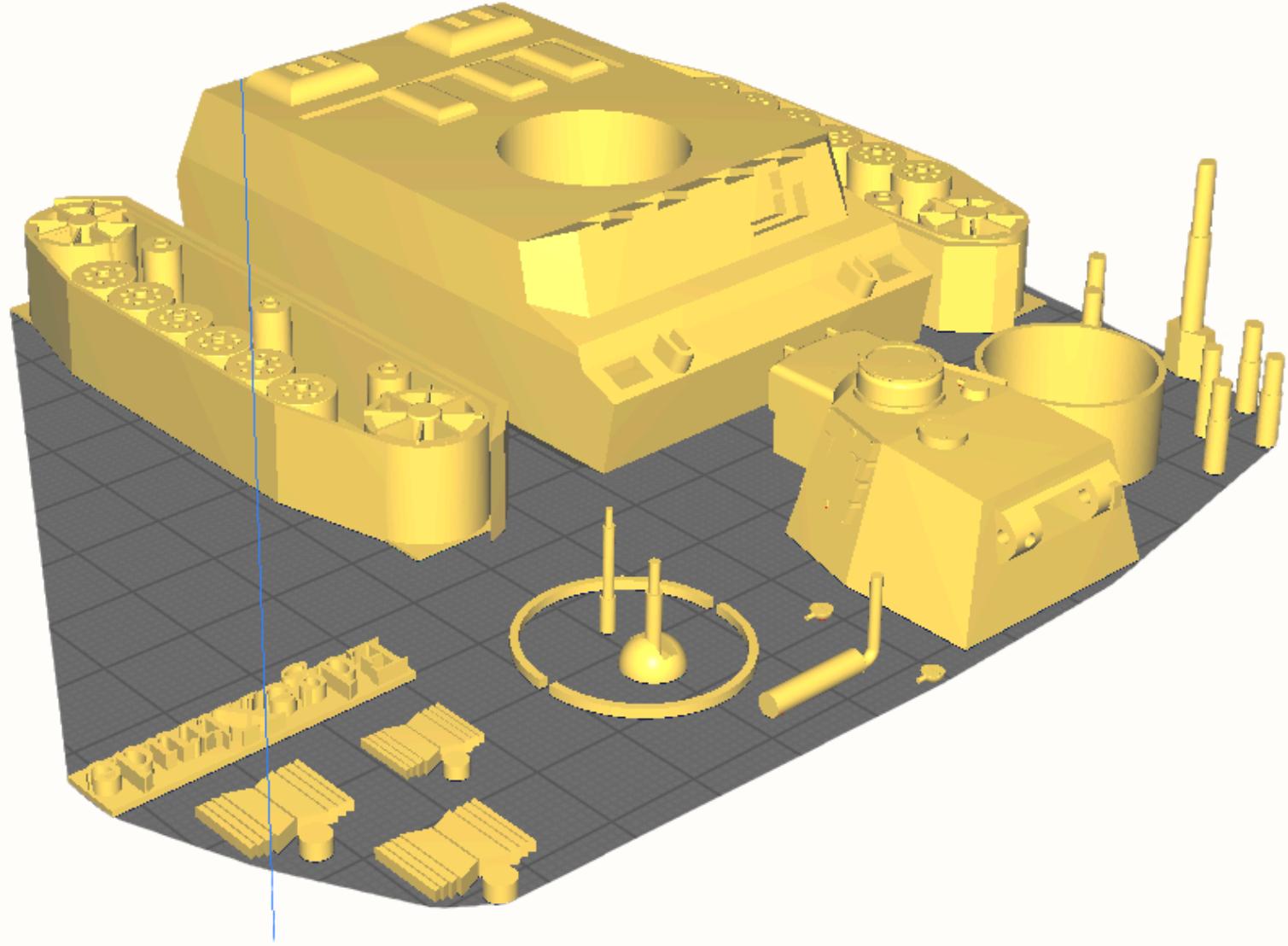
Mechanical complexities and creativity

We also printed the parts individually before putting them together to reduce printing time. For turret rotation, we designed a rotating ring .We also included our team name and IITH logo on our model.



How we made it?

We decided how to make the model then distributed parts to be made among us. After completing all parts we scaled them carefully in UltimakerCura.





3D Printing Results



The following images depict the finished model along various orientations.



Printing Considerations

Infill Density (30%)

Balances structural integrity with printing time. Higher percentages increase strength but extend production.

Support Structure Consideration

Zero(nearly) support structures saves material and printing time. Critical for complex geometries.

Tolerance Planning

Slight spacing was intentionally added between moving parts (like the turret and gun) to ensure smooth motion and avoid fusion during printing.

Model Scaling

Smaller models print faster but lose detail. We found the optimal size for detail retention.

With all these considerations we were able to reduce printing time from days to 10 hours 13 minutes.



Learning Experience



Project Management & Collaboration

Coordinating tasks, setting milestones, and maintaining clear communication sharpened our organizational skills and teamwork efficiency.



CAD Modeling

Working on the project with 3D printing in mind has been an illuminating experience as we operated on realistic parameters such as building time and structural integrity.



3D Printing Process

The novelty of 3D printing technology also contributed to us having a brilliant time, especially as we received insights into the printing process from the ground up



Assembly

Assembling the printed parts of the model was another highlight of our work on this project as it showed how even the most complex machinery could be forged from simple parts.



Project Outcomes

1

Functional Model

Working turret rotation and gun elevation

4

Team Members

Collaborative engineering effort

30%

Optimal Infill

Balance of strength and print time

100%

Success Rate

All learning objectives achieved

- Through this project, we learnt a lot about conceptualising an idea and building a prototype based on said idea. We witnessed the how and why of 3D printing and the properties of 3D printed objects. In summary, our group is now capable of not only making CAD models of our ideas but also fabricating prototypes of the models via 3D printing.



THANK YOU!

[MORE INFO »](#)

