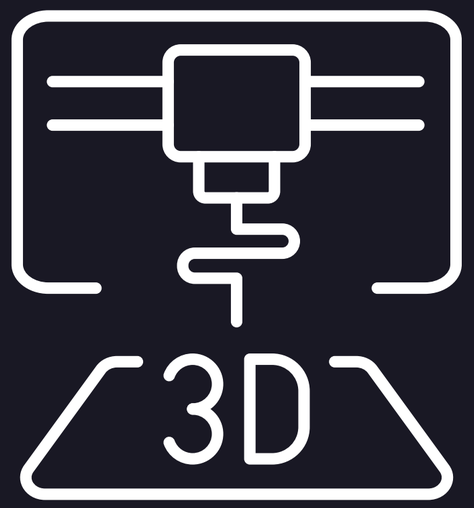


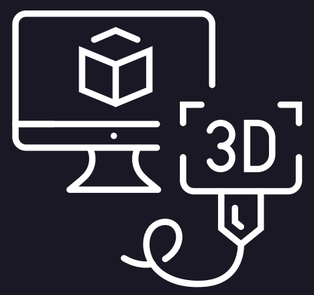
ISTE - CLUTCH

ADDITIVE MANUFACTURING SIMULATION

RAGHAV GANESH

OBJECTIVES

To set-up the environment & understand ANSYS APDL architecture



To obtain insights from 3-D Thermal Analysis of Direct Energy Deposition AM process

FE Model of a single bead deposition on a Mild-Steel plate

SUMMARY

This project aims to build a simulation model for one of the commonly used Additive manufacturing methods, Direct energy deposition (DED). In this process, Wire based DED systems feed wires through a nozzle and either use a laser, plasma arc, or electron beam to create the molten pool. The project also delves into the Fabrication methods; Welding is a fabrication process whereby two or more parts are fused employing heat, pressure, or both forming a joint as the parts cool. The project also aims to practice Finite Element Modelling for a single bead deposition on a Mild-Steel plate.

TOOLS & TECHNOLOGIES

PYTHON

ANSYS APDL

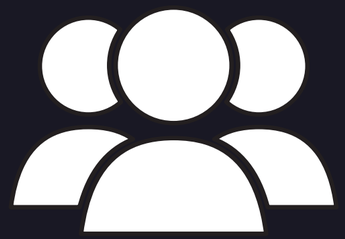
ABACUS

TIMELINE

ABOUT WHAT WE'LL GO THROUGH...

NOV	DEC	JAN	FEB	MAR
Simulate a static Gaussian distribution Heat Flux and moving Heat source.	Simulation of multi-layered thin wall structure. Write APDL scripts	Thermal analysis of Welding process, Heat transfer model in Abacus.	Buliding and exploring a generalised moving laser source for any simulation model.	Building in-house sim model for Welding using sophisticated tools in Classical Ansys.

(IMPLEMENTATION GOALS)



AM SIMULATION

DED 3D Printing Process

FABRICATION METHOD

Single Bead Deposition

PREREQUISITES

Your enthusiasm towards Research based Project

PPT LINK

ANY

QUERIES?