1. Stage Aerodynamics (Physics)

Reynolds Number (Re)
300000

Inlet Flow Angle (Alpha) [deg]
7.00

Stage Solidity (Sigma)
1.20

2. Blade Geometry (Mechanical)

Blade Height (Span) [cm]
8.00

Root Chord [cm]
6.00

Tip Chord [cm]
5.00

Twist Angle [deg]
30

3. Optimizer Settings

GA Generations
20

Population Size

ACS COLLEGE OF ENGINEERING

Department of Aerospace Engineering

Project - Compressor Blade Design Optimization using Artificial Intelligence

Team Members: Anjan Kumar N, Prerana DS, Lavani C, Tejaswini H

System Architecture: Nested Surrogate Optimization Framework. This tool designs **High-Pressure Compressor (HPC) Rotor Blades** by optimizing aerodynamic efficiency (L/D) while accounting for cascade interference effects (Solidity).

✅ AI Surrogate Model Ready

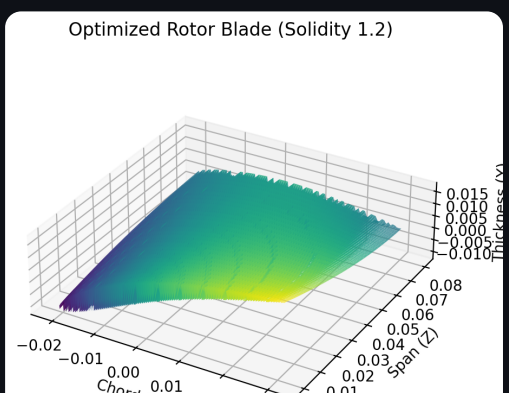
🚀 RUN OPTIMIZATION & GENERATE GEOMETRY

Phase 1: Profile Optimization

Target: Maximize Cascade Efficiency at Re=300000, Solidity=1.2

AI Drag (0.0001) is unrealistic. Applying 0.015 skin friction floor

Phase 2: 3D Geometry Generation



for Ansys validation.

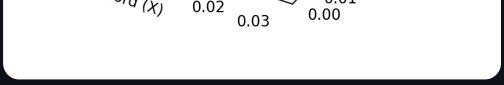
🏆 Stage Efficiency (L/D)

77.09

Effective Lift (Cl): 1.1563

Profile Drag (Cd): 0.0150

Optimization Converged.



💾 Download 3D Points (CATIA .csv)

Import this CSV into CATIA GSD using 'Import Points'.