Project 2 ANSYS DOE and Design Optimization

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MAE 598 Design Optimization

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Design Variables:

* Rotor Thickness
* Rotor Outer Diameter
* Rotor Inner Diameter

Design Constraints:

* 124mm < Rotor Outer Diameter < 160mm
* 66mm < Rotor Inner Diameter < 90mm
* 15mm < Rotor Thickness < 25mm

Design Objectives:

* Design a brake disc for emergency braking conditions with minimal volume
* Minimize the maximum stress in the brake disc
* Maximize the first natural frequency of the brake disc
* Minimize the maximum temperature in the brake disc

Potential Trade Offs:

The most notable tradeoff is between volume and the other objectives. Decreasing volume has a significant negative impact on stress and temperature results of the rotor.

Variable Continuity:  
Variables investigated in this analysis are continuous.

Optimization Methods:

Sensitivity Analysis: