

# **Design Optimization of Fixed Pad Journal Bearing for Rotor System Using a Genetic Algorithm Approach**

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## **ABSTRACT**

This paper focuses on the use of genetic algorithms in developing an efficient optimum design method for radial fixed geometry bearings. The approach optimizes based on minimum film thickness, power loss, stability, maximum film temperature, maximum pad pressure, and a global objective. Results for a three-lobe preloaded bearing are presented to provide a comparison with more traditional optimum design method such as the gradient-based global criterion method, and also to provide insight into the potential of genetic algorithms in design of rotor bearings. Genetic algorithms are efficient search techniques based on the idea of natural selection and genetics. These robust methods have gained recognition as general problem solving techniques in many applications.

**Keywords:** genetic algorithm, fixed-pad journal bearing, optimization, global optimum, rotor dynamics.